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Midterm Evaluation of the Bilateral cooperation between Zambia Environmental Management Agency (ZEMA) and the Swedish Chemicals Agency (KEMI) on Pesticide Management

Final Report

Sida

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August 2023

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Abbreviations and Acronyms

EMA	Environmental Management Act
EoS	Embassy of Sweden in Lusaka
GHS	Globally Harmonised System for classification and labelling of chemicals
HHP	Highly Hazardous Pesticides
KemI	Swedish Chemicals Agency
MSB	Swedish Civil Contingencies Agency
SEK	Swedish Crowns
ToC	Theory of Change
UFE	Utilisation Focused Evaluation
ZEMA	Zambia Environmental Management Agency

Preface

This evaluation was contracted by the Embassy of Sweden in Lusaka through the Sida Framework Agreement for Evaluation Services, and conducted by FCG Swedish Development AB.

The Evaluation Team consisted of Björn Ternström and Bridget Umar, assisted by Mwanza Kweleka and Jasper Musa. The Final Report was quality assured by Johanna Lindström, whose work was independent of the evaluation team. Aude Lemant provided project management support.

The team is grateful to all respondents who took time out of busy work schedules to receive us and participate in the data collection process. Special thanks are due Christopher Kanema, Principal Inspector at ZEMA, and Jenny Rönngren, KemI Advisor in Zambia,

On behalf of the team

Björn Ternström, Team Leader

Executive Summary

Background

This is an evaluation of the Swedish chemicals agency (KemI) technical assistance to The Zambian Environmental Management Agency (ZEMA) on pesticide management. The Swedish Chemicals Agency has collaborated with Zambia in one way or another since 2007. The current grant arrangement between Embassy of Sweden (EoS) and KemI to support the KemI Technical Assistance to ZEMA on Pesticide Management intervention was initiated in June 2020 and concludes 31st December 2023. Of the SEK 11,500,000 budget, SEK 7,078,000 was disbursed. The Embassy is the sole donor for the cooperation.

Sweden's relevant strategy for Zambia covers the period 2018-2023. It is sub-divided into strategic areas and the KemI Technical Assistance targets Strategy Area 3.

The intervention aims to achieve three sub-objectives:

- A revised registration process for pesticides in Zambia.
- ZEMA's management of highly hazardous pesticides has improved.
- An IT system for registration of pesticides is established and the information on ZEMA's website is further developed.

The Evaluation

The purpose or intended use of the evaluation is to help EoS, ZEMA and KEMI assess progress of the on-going bilateral cooperation and learn from what works well and less well. The evaluation will be used to inform decisions on how project implementation may be adjusted and improved and priorities for any potential future support. The primary intended users of the evaluation are KemI, ZEMA and the Embassy of Sweden in Lusaka.

The scope of the evaluation is the whole Bilateral cooperation. This is focused on the institutional capacity development of ZEMA, including support for legal changes. For context, a mapping of pesticide stakeholder perspectives is included (*see section 2.5 Comments to the Terms of Reference for background*).

The evaluation questions to be addressed are, based on the OECD-DAC criteria relevance, coherence, effectiveness, efficiency, and sustainability and are presented in the Evaluation Matrix in section 3.6.

Methodologically, the evaluation design combines a utilisation focus with a theory-based approach that has sought to be gender sensitive.

The evaluation design used a multi method approach for data collection. Document reviews, individual and group key informant interviews (KII) were combined with Social Learning Labs, a Zambia tested structured field methodology to support the emergence of divergent views – without significantly increasing the risk for individuals. Additionally, team members made observations during field visits to agro shops, with regards to types of pesticides stocked and interactions between farmers and agro dealers.

The evaluation has sought to triangulate and enrich data between sources (for example between key informants) as well as between data source types (such as document reviews versus SLL responses). Where data made this feasible, we explored gender-based differences. Field observations were used to triangulate interviewee statements and programme reports where feasible.

ZEMA is the implementing institution. The objective is to contribute to improved practices for the management of pesticides by building institutional capacity and developing the legal framework. The main programme focus is on preventive pesticide management. Targeted beneficiaries are people who are exposed to highly hazardous pesticides in various ways, either when the pesticides are being used or via food or drinking water.

Globally, KemI's development cooperation is focused on supporting the development of three system levels, individuals, institutions and an enabling environment. The approach has been contextualised and operationalised for Zambia.

The Theory based approach implies testing the programme's Theory of Change, a strategic analysis and programming tool designed to support a results-focused approach. The ToC seeks to describe the logical change pathways that are embedded in the programme design. This programme identifies systemic chemical risks and then uses capacity development to support institutional and legislative development. The intent is to strengthen the mandated agency's relevance and effect on lowering risk with the ultimate aim of improving end beneficiaries' (users and consumers) welfare. The team has sought evidence on whether the underlying assumptions in the ToC are valid, indicating that the ToC is realistic. The validity of the assumptions will confirm or reject the Theory of Change as a guide to how beneficiaries needs may best be addressed.

Section 4 presents the evaluation objects, with separate sections for Institutional findings and the mapping of stakeholder perspectives.

Findings

The Institutional sections describe the context and the programme implementation progress and challenges. Significant delays are noted, mainly caused by Covid and delays in parliamentary processes related to the ongoing amendment of the Environmental Management Act which governs ZEMA's mission and mandate. The section also notes programme adaptation to changes in context, for example replacing the development of an IT system with supporting the centralised national IT platform "Smart Zambia". Significant work supporting the legislative process and preparing for

implementation of the amended act is also noted. Preparations include developing regulations and guidelines to allow the establishment of a pesticides registration system once the legal process mandating ZEMA to do so has taken place.

Relevance

The intervention is described as relevant in relation to Swedish strategy, to Zambian development plans and to beneficiary needs. A selection of laws and regulations affected by or affecting the intervention is presented. Objectives and activities have been adapted to contextual changes.

Coherence

The programme is described as well integrated with past KemI support for capacity building efforts, such as International Training programme participation, regional collaboration in strengthening chemicals management and building capacity through professional networking.

Activities planned and undertaken are aligned with and supportive of ZEMA operational planning.

The evaluation has not been given access to sufficient data on interaction with other donors to be able to assess the overall coherence of international support to ZEMA.

Effectiveness

A commented list of programme achievements based on planned outputs is presented. Support for the legislative process has been successful in that proposed legal amendment has been influenced by ZEMA and has support but the process is not completed. Preparatory work for addressing proposed changes is in place. IT system ambitions have been replaced by national initiative.

Efficiency

Main questions raised about efficiency relate to staff turnover and consequences for capacity built. Lacking suitable benchmarking data, the evaluation refrain from assessing efficiency further, beyond noting that the bulk of the budget was pre-decided based on KemI and Zambian government standard costs.

Sustainability

Expected legal and regulatory changes are described as likely to be sustainable as are institutional changes such as revised work processes etc. Individual capacity development, while likely long-lasting, is at risk of being diluted by staff turnover, especially for certain specialists. Incentive structures are identified as a challenge for staff recruitment and retention.

Theory of Change

Evidence related to the validity of the assumptions implicit in the Theory of change is presented, identifying them as likely to be valid if/when the awaited legislation passes parliament.

Stakeholder Perspectives

The section continues with stakeholder perspectives on main issues around pesticides, based on the field work undertaken. Several issues emerged from the social learning labs and key informant interviews:

- Too many pesticide trade names are on the market, confusing farmers,
- Pesticide resistance is increasing,
- Agro dealers and farmers lack adequate knowledge for pesticide use and disposal,
- Highly hazardous pesticides are sold cheaply and are too easily accessible,
- Current ZEMA mandate is too wide for efficient pesticide management,
- Ninety-day import permit period disadvantages pesticide importers.

Multi-Dimensional Poverty and programme potential

The findings section is followed by a reflection on Multi-Dimensional Poverty and programme potential; poverty in terms of Resources, in terms of Power and Voice, in terms of Opportunities and Choice as well as in terms of human security is discussed.

Conclusions

Theory of change

The conclusions section begins with an assessment of the validity of the assumptions of the Theory of change. The assumptions identified include:

1. ZEMA management ensures staff have time, mandate and relevant positions in the organization to develop technical guidelines and standard operation procedures.
2. The work within the FAO supported project on highly hazardous pesticides (HHPs) progresses to serve as basis for proposal development to phase out HHPs.
3. IT hardware and a digital platform are available at ZEMA to enable inclusion of a pesticide registration module.
4. Identification of alternative products/methods to HHPs progresses, alternatives are available and accepted among extension officers and farmers.
5. Political willingness to engage in reforms aimed at systematic and effective control of pesticides that will safeguard human health and environment.

The evaluation concludes that, if the legislation is amended as expected, the assumptions in general are valid and therefore sees the Theory of Change logic as confirmed by available evidence. The programme is likely to have an impact on the core challenges it seeks to address.

OECD-DAC criteria

The evaluation concludes that the programme is highly relevant as it is in line with strategies, policies and needs. The programme is fully integrated with Zambian governance structure and implemented by the mandated government agency. Respect for the developing policy context, while delaying implementation, has allowed broad anchoring of the regulatory changes needed and has kept ambition levels in line with

political development in the sector and the evaluation concludes that the programme is coherent.

The evaluation concludes that the programme has not achieved its objectives. However, in a difficult context, the programme has been adaptive, productive and has effectively prepared for rapid implementation of changes necessary to achieve the intended objectives – once ZEMA is mandated to do so.

The bulk of the budget is related to pre-defined costs the programme management cannot control delays in implementation have resulted in significant underspending compared to the budget. The evaluation team has not had access to data allowing a benchmarking of the programme's efficiency.

ZEMA is a mandated government agency with a budget for the implementation of the programme. The technical advisory services provided by the programme are fully integrated into the operational plan of ZEMA. The evaluation concludes that the programme's institutional capacity building effects are sustainable and that its expected legal regulatory effects are likely to be sustainable. The risk that such sustainability is at risk from staff turnover is highlighted.

Lessons learned

The section on lessons learned highlights three issues:

- Incentive structures and their potential side effects on recruiting and retaining specialists.
- The need for cross ministerial collaboration to implement specialist advice from small technical agencies, including the possibility of devolving tasks to agencies that have a permanent local staff presence nation-wide.
- Lack of local language instructions/labelling is a serious problem. New technology opens up for cheaper, app -based, distribution of instructions in local languages without incurring high printing and distribution costs.

Recommendations

Recommendations to Sida:

- Provide a no-cost extension to the programme to allow for the regulatory work undertaken to be finalised, if ZEMA is mandated to do so with the passing of the amendment of the Environmental Management Act. First step would be the regulatory impact assessment.
- Consider a second phase, emphasizing implementation in relation to end beneficiaries. This would entail developing partnerships with a series of stakeholders (other ministries, importers, local institutions, NGOs and other private sector associations).
- Discuss the potential for support from other Swedish agencies (for example, but not limited to, the Swedish Civil Contingencies Agency (MSB) for response preparedness)

Recommendations to KemI:

- Participate in a no-cost extension to the programme to allow for the regulatory work undertaken to be finalised, if ZEMA is mandated to do so with the passing of the amendment of the Environmental Management Act. First step would be the regulatory impact assessment.
- Consider a second phase, emphasizing implementation in relation to end beneficiaries (refer Sida recommendation above). With reference to the limitations on ZEMA resources and the second lesson learned, which emphasises the need for cross ministerial collaboration in such implementation (ref section 9), KemI could potentially contribute by sharing Swedish experience on the complexity and practicalities of such interaction.

Recommendations to ZEMA:

Institutionally:

- Further develop collaboration with line ministries with local presence nationwide. If legal, identify tasks that can (and should) be devolved to them (after appropriate technical training).
- Explore how the incentives system can be adjusted to address the concerns regarding developing and retaining specialists.
- Mandate a QR code on labels. Mandate that the QR code provides information in the seven main local languages on active ingredient, use, risks and disposal of containers and unused/expired pesticide.

In future implementation:

i. Create awareness about pesticide resistance and encourage further research on why this occurs.
ii. In the licensing system for pesticide sellers, minimum standards for staff competence and quality of information given should be raised and better followed-up (compare role of veterinary assistants in distributers of veterinary supplies).
iii. Prohibit the worst HHP. For permitted HHPs, explore if sales can be limited to farmers that pass an app-based "exam" on how the chemical should be used (linking sales to application competence, not size of farm).
iv. Prescriptions should be required when buying highly hazardous pesticides. Such prescriptions could be issued by camp officers.
v. The subsidiary legislation on extended producer responsibility should be applied to pesticide importers by placing a charge on pesticide containers, which would be redeemable. This would go a long way in ensuring that “every container that goes out comes back”.

The Annexes provide background documentations and methodological details.

1 Introduction

This is an evaluation of the Swedish chemicals agency (KemI) technical assistance to The Zambian Environmental Management Agency (ZEMA) on pesticide management. The Swedish chemicals agency has collaborated with Zambia in one way or another since 2007. The cooperation has included facilitating Zambian participation in global and regional processes such as the Globally Harmonised System for Classification and Labelling of Chemicals (GHS) project which sought to strengthen Zambia's national capacity to implement the SAICM[1] and was implemented from 2010 to 2012.

Furthermore, a number of Zambian professionals have participated in KemI's International Training Programmes (ITP) on "Developing strategies for national chemicals management", including 17 staff members of ZEMA. The ITP addresses both theoretical and practical aspects of chemicals management. The practical elements involve participants in developing change projects. In Zambia such projects have addressed for example development of institutional infrastructure, strategic management of chemicals, importation border control, safe disposal of used pesticide containers, management of obsolete chemicals and phasing out of highly hazardous pesticides and improved understanding of labels and safety data sheets.[2]

An earlier evaluation highlights that ZEMA had been successful in building both individual professional and institutional capacity with support from the ITP.[3] In addition, Sida funding has been provided to other stakeholders involved in chemicals, and specifically pesticide, management for example Musika, a Zambian non-profit company working with ZEMA on safe use of pesticides among the agro-dealers.[4] The object of the evaluation has thus built on a series of earlier initiatives and is not a stand-alone project.

[1] Strategic Approach to International Chemicals Management

[2] Based on KEMI 2019, *Bilateral cooperation between Zambia Environmental Management Agency (ZEMA) and the Swedish Chemicals Agency (KemI) on chemicals management with a focus on pesticides* Rev. 2019-06-27

[3] Sida decentralised evaluations 2017:23, *Evaluation of ITP 299 – Strategies for Chemicals Management, Zambia case study*

[4] KEMI *Progress report 2021*_FINAL, KemI reference no: H19-06276

2 The Evaluation

2.1 BACKGROUND

The current grant arrangement between EoS and KemI to support the KemI Technical Assistance to ZEMA on Pesticide Management intervention was initiated in June 2020 and concludes 31st December 2023. Of the SEK 11,500,000 budget, SEK 7,078,000 was disbursed. The Embassy is the sole donor for the cooperation.

Sweden's relevant strategy for Zambia[5] covers the period 2018-2023. It is sub-divided into strategic areas and the KemI Technical Assistance targets Strategy Area 3; (Environment, Climate, Renewable Energy and Sustainable, Inclusive Economic Development and Livelihood), specifically:

- Sustainable use of natural resources, increased sustainable productivity and production in agriculture, and increased resilience to climate change; and
- Improved opportunities for sustainable livelihoods, with a focus on productive employment with decent working conditions, particularly for women and young people.

The technical assistance further seeks to contribute to the "Strengthened capacity in public institutions, including capacity to mobilise additional actors and resources for sustainable development" a strategy goal in Strategy Area 1 (Human rights, democracy, the rule of law and gender equality).

The intervention aims to achieve three sub-objectives:

- A revised registration process for pesticides in Zambia.
- ZEMA's management of highly hazardous pesticides has improved.
- An IT system for registration of pesticides is established and the information on ZEMA's website is further developed.

The Terms of Reference state that the Embassy is open to considering a no cost extension and that the evaluation at this point will allow for some reasonable assessment of project implementation and also give direction on what the project should focus on during the final and extended period of the agreement as well as beyond the project.

[5] Strategy for Sweden's development cooperation with Zambia 2018–2022, Reference No.: UD2018/10782/AF, https://www.government.se/contentassets/db59de2cb0254b2299ebd39669846767/strategy-for-swedens-development-cooperation-with-zambia-2018-2022.pdf

2.2 EVALUATION OBJECT

The object of the evaluation is the bilateral KemI Technical Assistance to ZEMA on Pesticide Management intervention. The intervention is described in greater detail in Section 4 below.

Please also note Section 2.5 Comments to the Terms of Reference below.

2.3 EVALUATION PURPOSE, OBJECTIVES AND SCOPE

The purpose or intended use of the evaluation is to help EoS, ZEMA and KEMI assess progress of the on-going bilateral cooperation and learn from what works well and less well. The evaluation will be used to inform decisions on how project implementation may be adjusted and improved and priorities for any potential future support.

The Terms of Reference identify two objectives for the evaluation:

- To Evaluate the relevance, effectiveness, coherence, efficiency and sustainability of the technical assistance to ZEMA and formulate recommendations on how its management team can improve and adjust implementation.
- To Evaluate the relevance, effectiveness coherence, efficiency and sustainability of the technical assistance to ZEMA and formulate recommendations as an input to potential discussions concerning a new phase of the intervention.

The primary intended users of the evaluation are KemI, ZEMA and the Embassy of Sweden in Lusaka (DCD).

The scope of the evaluation is the whole Bilateral cooperation. Please also note Section 2.5 Comments to the Terms of Reference below.

2.4 EVALUATION QUESTIONS

The ToR then lists a series of evaluation questions to be addressed. These are presented in the Evaluation Matrix in Section 3.6.

2.5 COMMENTS ON TOR

The evaluation team notes the forward-looking emphasis of the ToR as well as the comments made in the start-up meeting where three points were highlighted:

- That the legislative development the project focusses on has yet to be passed and end beneficiaries have therefore not been able to comment on project effects.
- That ZEMA in that meeting voiced concern that the ToR went beyond the project mandate.
- That EoS nevertheless welcomed an end-beneficiary/stakeholder perspective mapping as input for the discussions regarding the future direction. Meanwhile

such perspectives are not to be used in the assessment of organisational performance in terms of how objectives have been achieved.

In consequence the findings are subdivide into Institutional findings and Pesticide contextual findings.

The evaluation team notes that the mid-term evaluation is late, following implementation delays, largely due to Covid, legislative process delays and the consequences of a centralisation of certain IT investments.

Furthermore, in comments to the draft report, EoS emphasised that recommendations for "*a new phase of the intervention"* should not be limited to pesticide management. A broader consideration of ZEMA needs was to be considered by the evaluation team.

3 Methodology

3.1 OVERALL APPROACH

The evaluation design combines a utilisation focus with a theory-based approach that has sought to be gender sensitive.

3.1.1 Evaluation approach has been utilisation focused

A utilization-focused approach (UFE) has guided the interaction with ZEMA/KemI/EoS. The purpose of such an approach is to focus the evaluation process on end use. The systematic inclusion of main intended users seeks to ensure that data collected is validated and recognised by the users when conclusions and recommendations based on such data are presented. The approach "checklist" from the technical proposal is found (with minor updates) in Annex 4.

3.1.2 Evaluation approach has been Theory based

The evaluation has been Theory based. While not named as such, the Theory of Change (ToC) is implicitly clear from the programme description.[6] It is described in section 4 below. The team has identified the underlying assumptions in the ToC and sought evidence if they in fact indicate causality. The validity of the assumptions were then used to confirm or reject the ToC as a guide to how beneficiaries needs may best be addressed. Is the ToC logic confirmed by the evidence and is there evidence that the programme activities are having, or are likely to have, an impact on the core challenges that need to be addressed?

3.1.3 Evaluation approach has been gender sensitive[7]

Although both men and women are actively engaged in the chemicals market chain and smallholder farming in rural Zambia, women have lower access to productive resources and heavier workloads. Women's triple gender roles entail that they spend less time on productive activities than men. Gender norms dictate that men are the uncontested heads of households who generally make decisions independently regarding selection of application and tools/containers used for pesticides as well as participation in trainings on pesticide use. Such patriarchal gender relations carry over into agricultural development interventions and affect the distribution of project benefits. Development interventions that are gender neutral can potentially entrench such gender inequalities. Thus, the approach to the evaluation needed to be gender sensitive. For example, during data collection from farmers, discussions were held not only with women household heads, but women in male-headed households. The key informant interviews probed,

[6] See Programme description; KEMI 2019-06-27 *Bilateral cooperation between Zambia Environmental Management Agency (ZEMA) and the Swedish Chemicals Agency (KemI) on chemicals management with a focus on pesticides*: figures 2 & 3, pp 11-12 and p 15 as well as a narrative description in chapter 5 and a results framework in Annex 2

[7] We chose the term "gender sensitive" rather than "gender responsive" as an evaluation process, while mapping and analysing issues, does not respond to any challenges identified.

inter alia, gendered activities and outcomes of pesticide use and management. Analysis and reporting of results are disaggregated by gender whenever feasible and appropriate. Such gender sensitive analysis addresses the different experiences of stakeholders based on their gender roles and gender relations and is more likely to capture the important nuances that result in large differences in effectiveness of development interventions and policies.

3.2 DATA COLLECTION METHODS

The evaluation design used a multi method approach for data collection. Document reviews, individual and group key informant interviews (KII) were combined with Social Learning Labs, a Zambia tested structured field methodology to support the emergence of divergent views – without significantly increasing the risk for individuals. Additionally, team members made observations during field visits to agro shops, with regards to types of pesticides stocked and interactions between farmers and agro dealers.

3.2.1 Document review

The team reviewed project documentation, agreements, past reviews and evaluations. Relevant Zambian government policies and line ministry guidelines as well as Swedish government documents pertinent to the task were also reviewed. An explorative scan of other stakeholders' published documentation (academic research, concerned UN agencies, major Zambian partner governments) of direct relevance to the programme and its effects was conducted. It should be noted that this did not include a detailed mapping of current sector research but rather a very preliminary review, after which five journal articles were marked for further review and their highlights are included in this report. A list of documents reviewed may be found in Annex 2.

3.2.2 Social Learning Labs

Social Learning Labs (SLLs)[8] were used to collect data from smallholder farmers and agro dealers in a group setting. Two SLLs were conducted in Mumbwa District of Central Zambia. The first lab comprised male and female smallholder farmers engaged in rain fed farming, off-season vegetable gardening and livestock farming. All of them reported using pesticides and were thus knowledgeable about the topic under discussion. A total of 14 participants, drawn from eight villages and two agricultural camps participated in the first lab. The participants were divided into two sub-groups of seven men and seven women for discussion. The second lab for Mumbwa was conducted with a mixture of agro dealers and smallholder farmers; five farmers and five agro dealers. Agro-dealers are business firms of various sizes that engage in the distribution, storage and sale of agricultural inputs and implements, including pesticides. Having two different stakeholder groups in the discussions provided a unique opportunity for their mutual learning and co-production of knowledge. The SLLs covered types of pesticides; their uses and challenges; Knowledge levels on pesticide use regarding dosage, toxicity, disposal, regulations and effects on human, soil, water, crop, livestock and the environment.

[8] Details on the use and rationale for SLLs as a qualitative data collection tool are published in Umar and Nyanga (2022) (refer to Annex 5).

Similarly, two SLLs were held in Chipata city, Eastern Zambia. As before, the first lab comprised smallholder farmers engaged in rain fed, off-season vegetable gardening and livestock production. The first lab had five male and five female participants, drawn from six villages. The participants were all confirmed users of pesticides. The second lab comprised entirely of community agro-dealers, out of whom only three were women and seven were men. Community agro-dealers are farmers operating agro shops within their communities, in addition to their farming activities. They are invariably lead farmers involved in the training of fellow farmers on various aspects of agriculture, including pesticide use and disposal. Due to the lower number of women community agro dealers, the team decided to separate them into two sub-groups of five men only and a combined group of three women and three men. The discussions in the labs revolved around similar issues as for Mumbwa SLLs but were also unique in having discussions from community agro dealers who perform the dual role of pesticide traders and farming.

3.2.3 Key informant interviews and sampling

Key informant interviews were conducted with mainly individuals and some groups, to capture qualitative data. Quota sampling, integrating the gender sensitive approach, was employed to ensure that key informants represent key stakeholder groups. Stakeholder groups reached are listed in Annex 3. As the interviews were semi-structured, they allowed the team to explore emerging themes in a process drawing on outcome mapping. A total of 83 people were interviewed of which 35 female. Of the total 38 (18 females) were in Social learning lab contexts (i.e. group sessions).

3.2.4 Additional data collection comments

The evaluation has sought to triangulate and enrich data between sources (for example between key informants) as well as between data source types (such as document reviews versus SLL responses). Where data made this feasible, we explored gender-based differences. Field observations were used to triangulate interviewee statements and programme reports where feasible. For instance, the team observed interactions between agro dealers and farmers in agro shops, displays of pesticides in agro shops and performed quick assessments of pesticide types, focusing on highly hazardous pesticides. Similarly, field observations were triangulated with Lusaka based key informant interview responses and past ZEMA field mapping of issues.

3.3 PROCESS OF ANALYSIS AND DEVELOPING CONCLUSIONS

Data collected from both secondary and primary sources was collated in an excel based matrix. The data was then clustered into emerging themes allowing the assessments needed. The analysis used the existing Theory of Change to identify and test assumptions made and the Results' Framework and defined Indicators to assess achievement of intended results, based on reported progress and key informant perceptions. The overall assessment is based on contribution analysis without documenting every step of the methodology.

The evaluation team has used Multi-Dimensional Poverty Analysis (MDPA) based terminology in assessing likely future effects on poverty.[9] The evaluation team notes that a full MDPA requires much more data collection than is possible within the limitations of this process. Nevertheless, the framework is useful for structuring reflection on likely indirect effects on aspects of poverty and supporting the inclusion of differential impact and different needs and priorities of subgroups of the target population (refer section 7 below).

3.4 ETHICS AND PARTICIPATION

The evaluation team interacted with end beneficiaries that had not been affected directly by programme activities. In order to manage their expectations, the team emphasized the research nature of the activities.

Seeking to avoid individuals being held accountable for statements made, the team has not cited identifiable research participants in the final report. Furthermore, the raw data documenting the interviews that were conducted will not be shared.

Additionally, the published report contains a list of number and gender of persons interviewed, categorised by function/relationship to the programme. No list of the identities of interviewees is included although such a list has been shared confidentially with EoS.

3.5 LIMITATIONS

The evaluation was dependent on access to key informants, both in the institutions concerned and among the stakeholders targeted for the social learning labs. While it was easy to arrange SLLs by engaging local resource persons that helped to organise farmers and agro-dealers, some challenges were encountered in meeting other stakeholders.

The evaluation team has repeatedly requested, and repeatedly been promised, information about what support other donors have provided so as to make it possible to assess overall donor coherence. Such information has not been shared and overall coherence of external support can therefore not be assessed.

The team has not had access to budgetary/financial data allowing any benchmarking in assessment of efficiency

[9] For details regarding MDPA please refer https://cdn.sida.se/publications/files/sida62028en-dimensions-of-poverty-sidas-conceptual-framework.pdf . Kindly note that the evaluation team has not conducted a full MDPA, merely used the terminology to structure reflections on likely poverty effects.

Evaluation Matrix

The Evaluation Questions Matrix presented in the Inception Report was developed into the Evaluation Matrix below in order to be applicable to both field and Lusaka based data collection once the team met in Zambia.

Evaluation criteria	Evaluation questions	Indicators	Sources of information	Data analysis
Relevance: Is the intervention doing the right thing?	To what extent has the intervention objectives and design responded to partner/ institution needs, policies, and priorities, and have they continued to do so if/ when circumstances have changed?	Alignment with Sweden's strategy Alignment with relevant Zambian policies To what extent are intended/ implemented activities addressing needs/priorities of the stakeholders	Document review Document review and Key informant interviews (KIIs) Social Learning Labs (SLLs) and KIIs On-site observation (e.g. actual behaviour, physical storage, labelling etc.)	Comparison of programme with Strategy Comparison of programme with policies and KI perceptions Participant perceptions and dialogue based learning Triangulation of descriptions and observed reality
	To what extent have lessons learned from what works well and less well been used to improve and adjust intervention implementation?	Implementation chronology ZEMA staff/KemI advisor ability to exemplify Changes in programme work plans as reported	KII Document review	Does programme reporting /KII show evidence of adaptation to contextual changes?

Coherence: How well does the intervention fit?	How compatible has the intervention been with other interventions in the country, sector, and organisation where it is being implemented?	Knowledge of and reference to other stakeholders' programmes/ activities. Design priorities in work plans indicates avoidance of duplication, choices made refer to others' programmes/ activities Documented regular contacts with relevant stakeholders	KII Document reviews	Is collaboration considered relevant organisational strategy? Do design choices reflect knowledge of other stakeholders' capacities and intentions?
Effectiveness: Is the intervention achieving its objectives?	To what extent has the intervention achieved, or is expected to achieve, its objectives, and its results?	Are activities being implemented as programmed? Is there evidence that the assumptions of the Theory of Change are valid?	Programme documentation KII SLLs On-site observation	Comparison planned and implemented activities. Assessment of if the implementation is adapting to contextual changes Participant perceptions and dialogue based learning Triangulation of descriptions and observed reality

	What are the reasons for the achievement or non-achievement of objectives and what lessons can be learnt from these?	As above	As above	As above
Efficiency: How well are resources being used?	To what extent has the intervention delivered, or is likely to deliver, results in an economic and timely way?	Are the programme costs in line with normal ZEMA/KemI costs for similar activities	Programme documentation Perceptions of key informants	
	What measures have been taken during planning and implementation to ensure that resources are efficiently used?	Are there adjustments made during the project period that indicate a concern for cost	As above	Given that the bulk of the budget is related to KemI staff and overhead costs there is little scope for cost considerations.
Sustainability: Will the benefits last?	To what extent will the net benefits of the intervention continue, or are likely to continue?	Evidence of legal change Evidence of Institutional change (work processes, staff structure, staff development, turnover) Evidence of behaviour change in external stakeholder behaviour	Document review KIIs	Is the character of changes observed dependent on external support to continue. Is the institution itself stable in terms of funding, mandate, and stakeholder support

Table 1: Evaluation Matrix

4 Evaluation Objects

4.1 INSTITUTIONAL, THE PROGRAMME

The mid-term evaluation is late, following implementation delays, largely due to Covid, legislative process delays and the consequences of a centralisation of certain IT investments. The evaluation covers the implementation of activities planned in a three-year programme (2020-2023) with a budget of SEK 11,500,000 budget, of which SEK 7,078,000 has been disbursed. The bulk of the costs are related to KemI technical advisory services. Most of the budget is related to pre-defined costs that the programme management cannot control (KemI staff costs and overheads, Zambia government standardised allowances, travel regulations etc.)

ZEMA is the implementing institution. The objective is to contribute to improved practices for the management of pesticides by building institutional capacity and developing the legal framework. The main programme focus is on preventive pesticide management. Targeted beneficiaries are people who are exposed to highly hazardous pesticides in various ways, either when the pesticides are being used or via food or drinking water.

A ToC is a strategic analysis and programming tool designed to support a results-focused approach. The ToC seeks to describe the logical change pathways that are embedded in the programme design. This programme identifies systemic chemical risks and then uses capacity development to support legislative development. The intent is to strengthen the mandated agency's relevance and effect on lowering risk with the ultimate aim of improving end beneficiaries' (users and consumers) welfare. We have sought to illustrate it in the figure below[10]:

[10] See Programme description; KEMI 2019-06-27 *Bilateral cooperation between Zambia Environmental Management Agency (ZEMA) and the Swedish Chemicals Agency (KemI) on chemicals management with a focus on pesticides*: Figures 2 & 3, pp 11-12 and p 15 as well as a narrative description in chapter 5 and a results framework in Annex 2

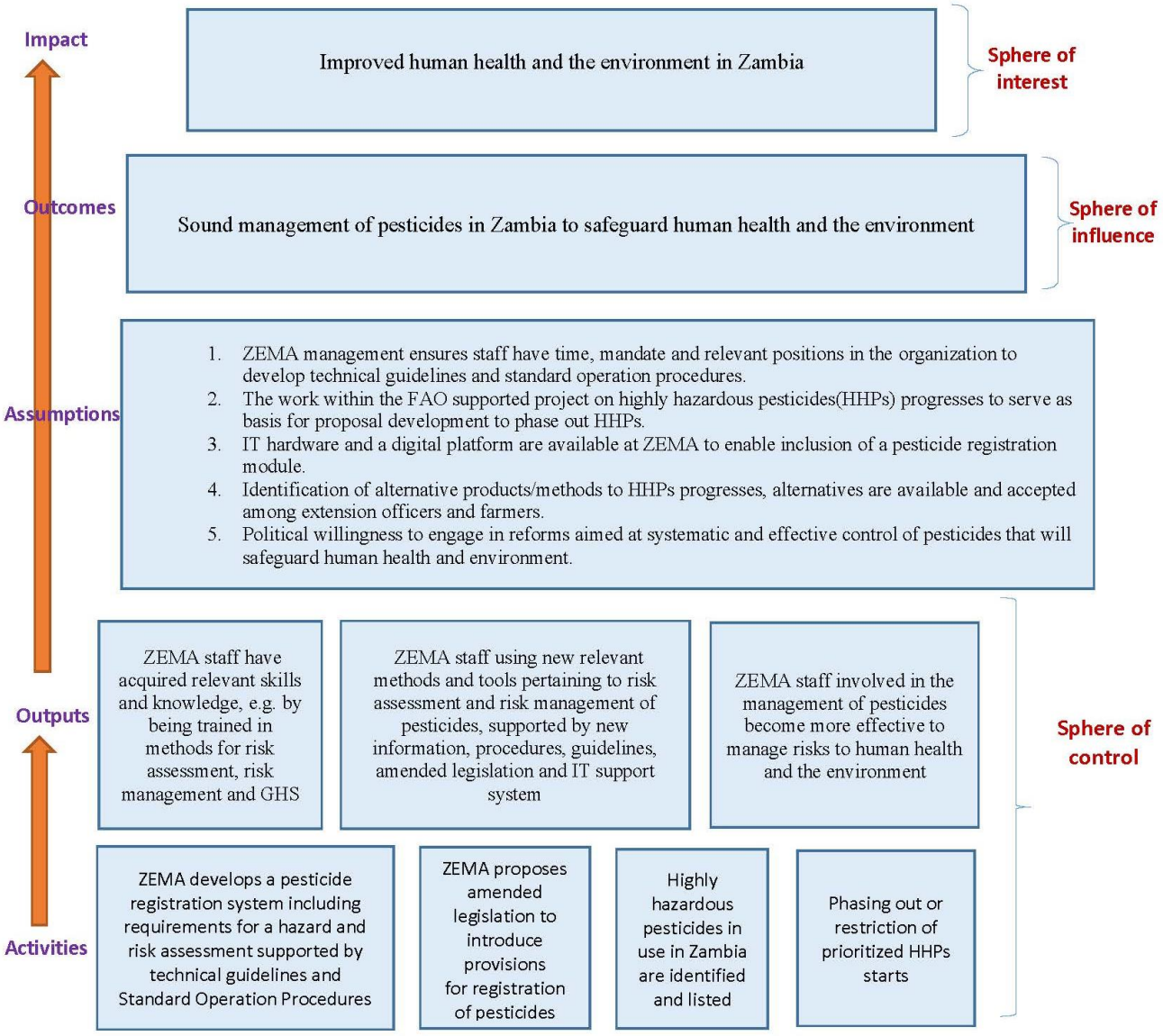

Figure 1: Illustration of the implicit theory of change of the programme

The team has sought evidence on whether the underlying assumptions in the ToC are valid, indicating that the ToC is realistic. Initial assumptions identified include:

1. ZEMA management ensures staff have time, mandate and relevant positions in the organization to develop technical guidelines and standard operation procedures.
2. The work within the FAO supported project on highly hazardous pesticides (HHPs) progresses to serve as basis for proposal development to phase out HHPs.
3. IT hardware and a digital platform are available at ZEMA to enable inclusion of a pesticide registration module.
4. Identification of alternative products/methods to HHPs progresses, alternatives are available and accepted among extension officers and farmers.
5. Political willingness to engage in reforms aimed at systematic and effective control of pesticides that will safeguard human health and environment.

The validity of the assumptions will confirm or reject the ToC as a guide to how beneficiaries' needs may best be addressed. Is the ToC logic confirmed by the evidence and is there evidence that the programme activities are having, or are likely to have, an impact on the core challenges that need to be addressed?

4.2 PESTICIDE CONTEXTUAL

In addition to the specific programme evaluation, the team has mapped perceptions of pesticide stakeholders in two provinces (refer Section 2.5, Comments to the ToR, above).

The data presented illustrate some of the challenges ZEMA faces if/when the amendment to the Environmental Management Act mandates the agency to proceed with registration of pesticides and improved regulation of the same. As the programme has yet to reach the field implementation stage, the field-based data feed into some of the conclusions and recommendations for the future but have not been used to assess institutional achievements.

5 Findings, Institutional

Zambia had a population of 19,620,769 as of 2022 and was growing at a pace of 3.4% year, which added to the strain on the country's resources.[11] Inequality and poverty levels are high with almost 55% of people live below the poverty line and more than 40% experiencing extreme poverty, according to the most recent study from the Statistical Office.[12] There are major geographic differences in the poverty rate with 23 % in urban areas and 77% in rural areas. The disparities are exacerbated by the fact that households headed by women often have lower incomes than households headed by men.[13]

Nearly half of Zambia's population experiences undernourishment and high levels of hunger due to pervasive food insecurity.[14] Poor households frequently have restricted diets that are largely composed of maize, which can cause major health issues, particularly among children.

Education and poverty are closely related; households led by people with no formal education or only primary education have the highest rates of poverty. Between rural and urban areas, as well as between women and men, there are greater educational differences, with teenage dropout rates among girls a serious problem.[15] In this context farmers use of pesticides to increase productivity is growing rapidly.

5.1 LEGAL AND INSTITUTIONAL CONTEXT OF PESTICIDE MANAGEMENT

The use and management of pesticides in Zambia touches the mandates of a range of government institutions and is governed by the intersection of several legal areas including environment, development, health, water and sanitation, national standards, customs, and policies related to the agriculture and extraction industries. The core legislation, currently under amendment is the Environmental Management Act No 12 of 2011,[16] which consolidates several laws related to chemicals, waste management and environmental issues.

Zambia has signed and ratified a series of relevant multilateral agreements:

[11] Zam Stat, 2022

[12] COS, 2015

[13] COS, 2015

[14] IFPRI, 2017

[15] UN, 2013

[16] https://wedocs.unep.org/bitstream/handle/20.500.11822/9076/-The%20Environmental%20Management%20Act,%202011%20-%20Zambia-2011Zambia%20Environment%20Management%20Act%202011.pdf?sequence=3&amp%3BisAllowed=

- Rotterdam Convention: 1994.

- Stockholm Convention: 2006.

- Basel Convention: 2011.

- Minamata Convention: 2016.

The Globally Harmonised System for Classification and Labelling of Chemicals (GHS) project was implemented from 2010 to 2012. Key informants mention that follow-up work aiming towards broader implementation is still being undertaken.

ZEMA is the technical agency mandated to address pesticide regulation and use. However, multiple key informants highlight that its human and financial resources are limited. The agency is therefore dependent on other government structures to improve extension and control measures. ZEMA is represented in Lusaka and five provinces while other concerned Ministries, such as Agriculture, Community Development & Social Services, Health, Local Government & Rural Development as well as Water Development & Sanitation are present in every district throughout the country.[17]

The farmers themselves decide when and what to apply as well as protective measures used to lower risk and the modalities of disposing containers and unused chemicals. Hence, implementation of pesticide management is, by definition, decentralised. This accentuates the challenge of addressing corruption in practical implementation. This challenge was identified in a 2017 evaluation[18] which noted that Zambia, at that time, ranked 87th out of 187 countries by Transparency International. While recent regime change may herald improvements, the latest TI ranking places Zambia 116th of 180 countries (2022).[19] The evaluation team notes that the Finance Director has four years of professional anti-corruption work prior to joining ZEMA and that staff cite a high degree of digitalisation and open space work areas[20] as limiting opportunities for inappropriate behaviour.

5.2 PROGRAMME IMPLEMENTATION PROGRESS AND CHALLENGES

Globally, KemI's development cooperation is focused on supporting the development of three system levels, as shown in Figure 2 below.

[17] Ministers | National Assembly of Zambia (parliament.gov.zm) downloaded 230705

[18] Sida Decentralised Evaluation 2017:23 *Evaluation of ITP 299 – Strategies for Chemicals Management*

[19] https://www.transparency.org/country/ZMB

[20] Cited by a key informant as contributing to transparency by limiting the scope for "out of sight" discussions and transactions.

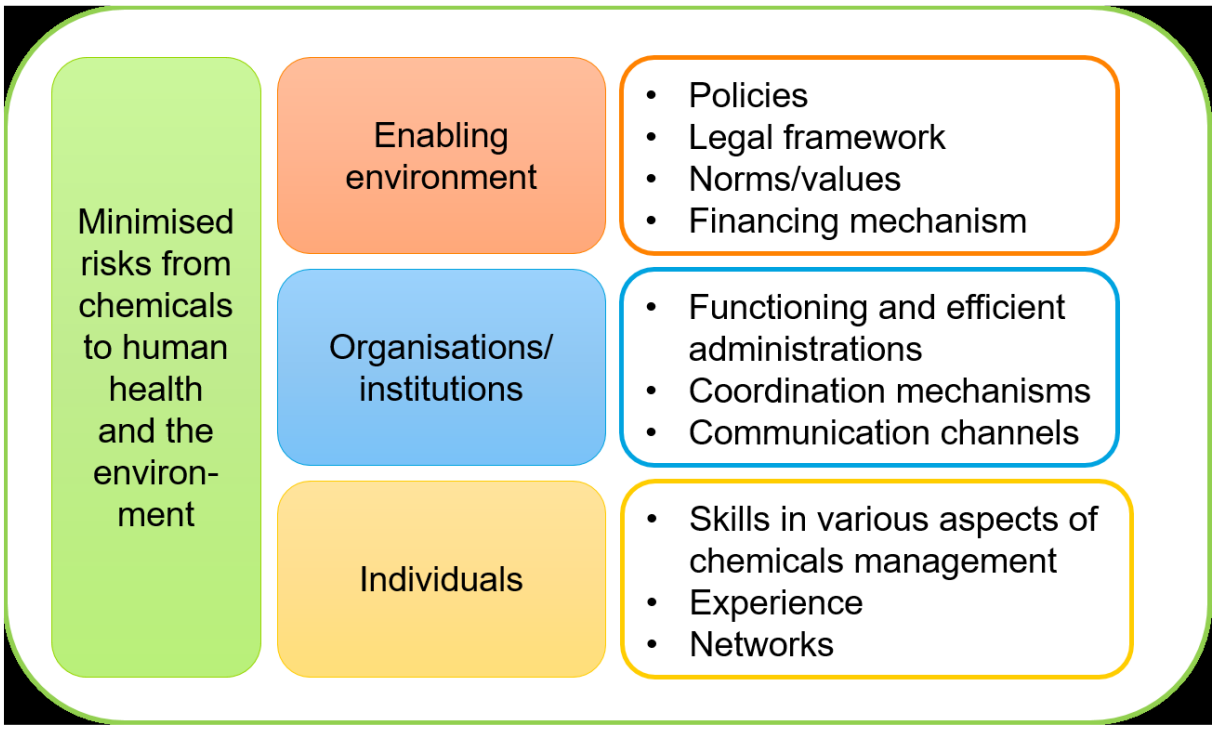

Figure 2: The various aspects covered by KemI in the work on development cooperation and the different levels where the change and results are expected [21]

The design and implementation of the Zambia technical assistance programme was developed to integrate with ZEMA overall development. This has implied consideration to, and close interaction with, other capacity development efforts and the ordinary operations of the agency. The technical assistance programme activities are integrated to an extent where differentiating its effects from other capacity building operations and normal operations is neither possible nor reasonable to attempt. At the three levels that KemI normally works, the Zambia support has included:

Intervention target and type	**Effects, as described by key informants or reported in programme documentation**
For individuals:	
ITP participation.	Highly effective, adapted to individual professional needs.
Peer to peer exchanges.	Very useful, especially for broadening perspective and getting comparative examples of how to deal with practical challenges related to implementation in

[21] KEMI 2019: *Bilateral cooperation between Zambia Environmental Management Agency (ZEMA) and the Swedish Chemicals Agency (KemI) on chemicals management with a focus on pesticides* Rev. 2019-06-27, p 15.

	different contexts. Regional interaction highlighted.
Network building.	Better understanding of the need for this has developed; two types are highlighted: i) within the profession (see peer to peer) and ii) with counterpart agencies with whom collaboration needed for implementation.
Joint, hands-on, work with the in-country advisor.	Structuring/mentoring in work planning and addressing upcoming challenges.
For ZEMA institutionally:	
Cumulative effect of multiple participants in ITP rounds.	Contributed to developing common understanding of mission, joint understanding of chemicals issues, joint terminology.
Cumulative effects of such participants' projects when implemented in ZEMA operations.	Project selection and implementation described as well integrated in day-to-day operations. Their implementation described as furthering the aims of ZEMA and increasing technical implementation capacity.
Study visits to Sweden.	Described as highly useful "an eye-opener", "point of reference/comparison when thinking of what would be realistic for us".
Technical drafting sessions focused on supporting the amendment of the Environmental Management Act.	Cited as important "technical advisor's practical implementation background very useful", "helped us limit short term ambitions to agricultural chemicals while leaving open a possible future expansion into industrial chemicals".
Developing the regulatory framework to be implemented for pesticide registration once parliament approves the amendment.	Technical advisor's input cited as important. Practical implementation now better prepared for if/when amendment passes.
Trainings on the globally harmonised system for classification and labelling of chemicals (GHS).	Increased awareness of counterpart agencies. Also cited as enhancing recognition of ZEMA lead role.
Various field mapping of issues and gap analyses of needed institutional development to address such issues.	Used to adapt ZEMA work planning in order to address identified issues.
Mapping of Highly Hazardous Pesticides (HHP) in use.	Built on and complemented prior FAO studies. Initial mapping done and technical level interaction with stakeholders initiated in preparation for

	future mandate expected with EMA amendment.
Research undertaken, improved capacity and more active collaboration with non-ZEMA stakeholders.	Raised political visibility, increased recognition of ZEMA as lead agency.
Joint, hands-on, work with the in-country advisor.	Contributed to systematic planning and prioritisation.
For the enabling environment:	
Research and legal gap analysis in support of the amendment of the Environmental Management Act.	Amendment has passed first two readings in Parliament with solid political support. Some key informants believe that good ZEMA groundwork has contributed to this.
Interaction with the Smart Zambia Institute (a Division in the Office of the President which is charged with the responsibility of the management and promotion of electronic Government services and processes) to address the practicalities of including ZEMA digitization needs in the centralised government digitisation process that is on-going.	Objective to develop ZEMA IT system internally dropped in favour of contributing to integrating ZEMA needs into centralised system. Process described as flawed due to time pressures likely resulting in a suboptimal system based on old, analogue, formats.
More systematic networking.	Described as raising awareness among counterpart agencies (Min of Agriculture, Bureau of standards, Customs etc) about risks/opportunities related to chemicals management (primarily pesticides) and clarify inter-agency mandates and responsibilities. Described as raising awareness in parliament about the same.

Table 2: Overall support to ZEMA through KemI and effects as perceived by key informants. Note that the table includes earlier interventions such as ITPs. The bulk of the budget implications of the above is born by ZEMA normal budget. The current Technical Assistance programme external (Sida/KemI) contribution mainly used to fund the technical advisor.

5.3 RELEVANCE

Comparing the programme design with Sweden's strategy for Zambia shows that it is well in line with overall intentions. Programme activities are fully integrated with Zambian National development plans as expressed through ZEMA's mandate and work planning (to the extent that implementation delays are largely due to awaiting a revised mandate).

5.3.1 Relevance to Regulations and Policies

Regulations and Policies relevant to the programme include:

Environmental Management (Licensing) Regulations (Statutory Instrument No. 112 of 2013)
Several sections of the regulations pertain to pesticide management including ZEMAs mandate to oversee the pesticide registration process; pesticide transportation, storage and disposal. Essentially, these regulations cover all aspects of pesticide regulation in Zambia. The programme directly contributed to the revisions to the mother legislation, which has resulted in the formulation of the Environmental Management (Amendment) Bill of 2023 which *inter alia*, provides for the registration of pesticides or toxic substances and revises the provision on summary imposition of penalties.

Occupational Health and Safety Act No. 36 of 2010
This Act provides for the protection of persons, other than persons at work, against risks to health or safety arising from, or in connection with, the activities of persons at work; and provide for matters connected with, or incidental to, the foregoing; and provides for duties of manufacturers, importers and suppliers of articles, devices, items and substances for use at work. This includes protection for persons handling pesticides as part of their duties.

ZS555: 2006 Handling of Pesticides. Code of Practice
This code specifies practices which reduce risks in the handling of pesticides, including how to minimize adverse effects on humans and the environment and prevent accidental poisoning from improper handling of pesticides. It covers those working in factories, agro dealers and farms. The code was developed by the Zambia Bureau of Standards, an agency under the Ministry of Commerce and Trade. The programmes interventions which relate to improved pesticide registration and categorization directly contribute to practices around pesticides, their accessibility and who can access them, including ZEMA's capacity to periodically monitor pesticide storage, distribution and use. All these aspects are directly relevant to the code of practice.

Water Resources Management Act (No. 21 of 2011)
The Act provides for the establishment of the Water Resources Management Authority (WARMA) and defines its functions and powers; and inter alia, provides for the management, development, conservation, protection and preservation of the water resource and its ecosystems. The Act mandates WARMA, in conjunction with ZEMA, to monitor the resource quality and control the pollution of any water resource. The proposed revisions of penalties on pollutants in the Environmental management (Amendment) Bill of 2023 directly relates to the provisions of this Act on water resources pollution.

National Agricultural Policy (2012-2023)
The policy envisions sustainable increase in agricultural productivity and improved access to productive resources and services for small-scale farmers, especially women and young farmers, in rural areas to enable them to increase production of staple foods,

including fruits and vegetables, for subsistence and income generation. This aspiration partly hinges on increased access to pesticides and improved pesticide management through sustainable agricultural, which encompasses integrated pesticide management. Integrated Pest Management is supported through improved pesticide management, which the programme is focused on.
The mandate of the agricultural research institute is to provide high quality, appropriate and cost-effective services and in part, to generate plant protection technologies. This extends to research on chemical and bio pesticides, their uptake and management by farmers.

Medicines and Allied Substances Act (No. 3 of 2013) and the Medicines and Allied Substances Act (Agro-Veterinary shops) Regulations, 2016.
This Act provides for the establishment of the Zambia Medicines Regulatory Agency (ZAMRA) and the registration of agro-veterinary shops. The Regulations spell out the process of registration of agro-veterinary shops and regulate the sale of veterinary products. For example, they make it mandatory for agro shops stocking certain veterinary products to have a trained person on site. These include pesticides for the control of veterinary diseases. Any changes in regulations around storage and distribution of pesticides, and access to pesticides are directly relevant to this Act and its subsidiary legislation.

5.3.2 Relevance in the face of contextual change

Programme documentation and key informant chronologies of programme activities show repeated adaptation to changes in context designed to maintain relevance. The most obvious are the adaptations in stakeholder interactions made necessary by Covid.

The planned IT development activities have been replaced by interactions with a centralised IT development programme (Smart Zambia). Many of the tasks involved such as identifying needs and developing specifications, have needed to be done anyway but in relation to an external supplier.

Programme activities were also changed due to the significant delays in the Environmental Management Act amendment process. This involved changing from actual implementation to preparations for future implementation such as developing regulations and guidelines not possible to launch until ZEMA is mandated to do so. Once the EMA is amended, decisions to launch are Ministerial and will not necessitate additional parliamentary action.

5.3.3 Future ZEMA challenges

Management notes ZEMA's very broad mandate and the need for support in multiple areas. In brainstorming around potential areas of collaboration with Sweden, two areas were highlighted:

- Swedish experience with responses to chemical accidents/environmental damage with reference to the Swedish Civil Contingencies Agency (MSB), and
- Support in increasing capacity for Strategic environmental assessments related to Land Use Management.

5.4 COHERENCE

Key informants describe cross sectoral information exchange and show good understanding of other stakeholders' mandates and concerns. Programme documentation illustrates efforts to raise awareness of eternal stakeholders (counterpart ministries, private sector, sector active NGOs) and emerging regularity of such efforts. With ZEMA as the mandated lead agency, activities are, almost by definition, coherent with national policy development.

As described above, the intervention was clearly coherent with national policy and previous Swedish support.

The evaluation team has repeatedly requested, and repeatedly been promised, information about what support other donors have provided so as to make it possible to assess overall donor coherence. Such information has not been shared and overall coherence of external support can therefore not be assessed.

5.5 EFFECTIVENESS

The programme was designed to achieve the following outcomes, which in turn were expected to contribute to the overall objective:

Outcome	Indicators	Achievement	Comment
Short-term objective 1 - A revised registration process for pesticides in Zambia to support registrion of efficacious products that will not cause unacceptable harm to human health and the environment is established and the capacity of ZEMA staff and other relevant institutions has increased			
1.1 A revised pesticide registration process, including technical guidelines, Standard Operating Procedures etc., is developed	Guidelines, checklists, templates etc. for applicants and pesticide registrars are developed and tested	Not in place. A simpler licencing process, that was there pre-programme, has been digitised. Preparatory work for the registration process has been done. Implementation awaiting amendment of the Environmental Act. Draft regulations, data registration formats etc. have been developed but final version needs to be based on actual wording of legislation. Consultations to test proposed designs with external stakeholders have not been possible prior to the mandate from the amendment.	Parliamentary amendment of the EMA requires three readings in parliament with stakeholder consultations in between. ZEMA has influenced the wording of the amendment which passed the first reading and had its second reading on July 6th. Different sources give different assessments of when EMA amendment is likely to pass (ranging from July to November). Key informants report that there is political support, with key stakeholders recognising the need and overall accepting the wording proposed.

1.2 The capacity of ZEMA staff and other relevant institutions to handle pesticide application according to the new process has increased	Ability to handle applications according to the new pesticides' registration process.	A training is planned for August 2023	Part of the specialist knowledge needed is included in the ITPs conducted. Staff members with such training have been assigned new tasks since they took the programme, diluting capacity within this speciality. Current ITP participants will gain similar capacity but whether this increases overall ZEMA capacity in the specialist field will depend on what assignments they are given over time. Challenges related to staff turnover noted by the team. ZEMA perceived as competent and professional by external key informants (agro dealers, local government technical officers, sector associations). ZEMA also seen as very under-resourced in relation to their mandate. The latter confirmed by ZEMA staff.
	Number of participants in trainings that have increased their capacity to assess pesticides	25 participants from ZEMA (17 participants) and other concerned ministries and agencies (7 participants) took part in a 3-day advanced training on GHS where they learned to apply the classification criteria. Capacity development through the Technical Advisor, complemented by ITP participation and University of Cape Town pesticide risk management programme (also funded by Sida) is described as having significant institutional development effect on ZEMA.	

			Meanwhile ZEMA also described as competent at "outsourcing" tasks to relevant partners e.g. using Croplife to training.
Short-term objective 2 - ZEMA has improved its management of highly hazardous pesticides has improved			
2.1 Highly hazardous pesticides in use in Zambia are identified and listed	Knowledge on which pesticides used in Zambia that fulfill the criteria as HHPs	Preparations made but implementation awaiting mandate expected with amendment of EMA. First listing of HHPs is available and has been useful in Rotterdam Convention reporting. A stakeholder technical working group is established and researching practicalities. Stakeholder meetings held to validate the list and develop strategy for phasing out.	HHP management requires iterative risk assessment of relevant chemicals. Such assessments require highly competent and specialised staff. Concern was expressed that the current incentive structure, within which field allowances play a significant role, will cause recruitment and retention difficulties in developing such specialist skills (also refer Lessons Learned below).
2.2 Available alternatives are identified and a management plan for HHPs is developed	Knowledge on suitable alternatives to HHPs in use in Zambia, and Agreed risk management measures	Not happened	Dependent on mandate from amended EMA
2.3 New or amended legislation is proposed	Recommendations for amendments of the legislation is proposed, and Draft legal text is available.	Done	Has passed second reading (of three) in Parliament.

Short-term objective 3: An IT system for registration of pesticides is established and the information on ZEMA's website is further developed			
3.1 A specification for an IT system is available and an IT consultant has been procured, and 3.2 An IT system for pesticide registration is available and tested	Content/requirement for the IT system discussed and agreed Suitable consultant identified and procured and IT system for registration of pesticides developed and tested	Not done. Plans adjusted to adapt to "Smart Zambia" centralised IT system being developed.	Joint planning and identification of needs initiated. Appropriate resourcing not possible due to lack of mandate prior to amendment of EMA. Time pressure on "Smart Zambia" to get system up and running has led to under-investment in preparation which will likely result in a cumbersome system built on current paper-based routines.
The information on ZEMA's website is further developed		Not done. Awaiting clarity on mandates and changes to follow amendment of EMA	

Table 3: Programme achievements in relation to objectives. Based on KemI Progress report 2022[22] with selected comments from key informant interviews, primarily with ZEMA staff members, current and former.

[22] KemI 2022, *Bilateral cooperation between Zambia Environmental Management Agency (ZEMA) and the Swedish Chemicals Agency (KEMI) on pesticide management, Progress report 2022*

5.5.1 Validity of the Theory of Change

The likelihood that an intervention has contributed or is likely to contribute to its overall objectives may be assessed by testing the validity of the assumptions upon which the theory of change of the programme is based. The evaluation team identified and assessed the assumptions as follows:

Assumption	Assessment of validity
ZEMA management ensures staff have time, mandate and relevant positions in the organization to develop technical guidelines and standard operation procedures.	Not yet. Delays in the legislative process mean that ZEMA is not yet mandated to do so. Managers are likely to prioritise these tasks when the agency is mandated to do so. The agency is understaffed, and it is questionable if the assumption will be fully valid even when mandate has been given.
The work within the FAO supported project on highly hazardous pesticides (HHPs) progresses to serve as basis for proposal development to phase out HHPs.	Yes, the work is progressing. Initial proposal has been presented and is being processed by a technical working group of stakeholders. 7 FAO district studies have been complemented with 8 ZEMA district studies to achieve better geographical coverage. Future risk assessments needed to keep list up to date dependent on availability of highly skilled specialists. Recruitment/retention of such specialists is threatened by incentives system prioritising field work over specialist, desk based, work. Low pay and lack of promotion opportunities repeatedly cited as leading to high staff turnover. (refer Lesson learned section)
IT hardware and a digital platform are available at ZEMA to enable inclusion of a pesticide registration module.	Intended activity replaced by “Smart Zambia” centralised IT initiative. Work planning adapted to accommodate context change.
Identification of alternative products/methods to HHPs progresses, alternatives are available and accepted among extension officers and farmers.	Delayed, awaiting HHP list processing. Requires research and collaboration with extension services. Need to further develop collaboration with such stakeholders.

Political willingness to engage in reforms aimed at systematic and effective control of pesticides that will safeguard human health and environment.	No significant political resistance, clear political will. Consensus among key informants that there is demand for better regulation. Low pay and lack of promotion opportunities lead to high staff turnover. Questionable political will to provide sufficient resources for ZEMA to become a competitive employer.

Table 4: Assumptions underpinning the Theory of Change and their assessed validity

5.6 EFFICIENCY

The bulk of the budget is related to pre-defined costs that the programme management cannot control (KemI staff costs and overheads[23], Zambia government standardised allowances, travel regulations etc.).

Initial implementation was hampered by slow finalisation of the cooperation agreement between ZEMA and KemI and related approval of work permit for the technical advisor. It is unclear to the evaluation team whether the assignment of the advisor to her duty station, despite the delays in work permitting, was more or less efficient than it would have been to delay secondment.

Delays in implementation have resulted in significant underspending compared to the budget (MSEK 6,44 compared to planned MSEK 11,5 at end of 2022[24], with MSEK 7,08 disbursed to date[25]). The evaluation team has not had access to data allowing a benchmarking of the programme's efficiency.

Several stakeholders describe ZEMA as having low pay and a lack of promotion opportunities compared to other agencies and private sector companies. "*There is a lot of poaching of ZEMA staff by others. They do not have time to train the staff they need so they simply poach from ZEMA."* This is described as leading to high staff turnover significantly affecting ZEMA's capacity.

There is also the view that ZEMA has recruited too many Natural Resource Management and Environmental Management graduates and not enough Chemistry graduates, making the agency vulnerable to loss of specialist capacity. The evaluation team was informed that recent recruitment has emphasised Chemistry graduates (based on a single source that the evaluation team have not been able to triangulate).

[23] Estimated at MSEK 10 out of the total MSEK11.5, based on original programme proposal budget: KemI 2019 *Bilateral cooperation between Zambia Environmental Management Agency (ZEMA) and the Swedish Chemicals Agency (KemI) on chemicals management with a focus on pesticides, Programme description* pp.37-38

[24] KemI 2023: *Financial report 2022_translation.pdf*

[25] Terms or Reference background

5.7 SUSTAINABILITY

The legal and regulatory changes that the programme seek to put in place are structural in nature. If/when the EMA is amended, stakeholders are convinced they will broadly influence chemicals management in Zambia for decades.

The practical implementation of such changes is partly prepared by the activities of the programme but will require further efforts and resources over coming years in order to affect the end beneficiaries.

The institutional development of ZEMA that has taken place is described as having changed working processes and planning horizons – changes that are likely to be sustainable.

Individual capacity development is not likely to be reversed. Institutional development related to such professional development is described as at risk due to challenges related to retaining staff. This is reported to be especially challenging in relation to specific staff functions and the incentive system for specialists (for example risk assessment skills are mainly developed through persistent desk-based work while field allowances are important for overall income for most staff).

6 Findings, Pesticide Stakeholder Perceptions

Africa's agricultural sector faces a serious threat from pests and diseases.[26] As a result, its farmers are increasingly dependent on chemical pesticide usage for pest and disease management in their crop and livestock production. Zambia is not an exception to this. According to a survey on chemical pesticide use among smallholder farmers conducted in five districts of Zambia,[27] a total of 162 chemical pesticide trade names, with 52 active ingredients were used by farmers. Another study[28] reported that a third of farmers (33.9%) in Zambia made 6-10 pesticide applications per season, while Malambo *et al*., (2019) reported that about 29% of farmers made 1-5 applications per season. During the SLLs in both Mumbwa and Chipata, the participant farmers noted that for some crops, they apply pesticides weekly; from the time the shoots emerge all the way through to a few days before harvesting. They elaborated that some crops required to be sprayed with pesticides from their emergence to prevent pest infestation as the pests were reportedly much harder to control when the plants become infected. The practice of preventive spraying was confirmed by two horticultural experts interviewed as key informants.

Farmers and key informants agreed that pesticide use was higher in vegetable gardening than rain fed agriculture. Vegetable gardening is common during the dry season (May to November) and largely involves production for the market. The most commonly grown crops are tomato, cabbage, rape, Chinese cabbage, African eggplants, green pepper, green beans, onions, spinach and winter maize. Crops grown during the rainy season (November to April) that routinely require the application of pesticides are cotton, tobacco, soya beans, and increasingly maize. Several key informants observed that fall army worm has become endemic and necessitated seasonal application of pesticides to maize. They further confirmed increased incidences of crop and livestock pests and diseases, which some attributed to climate change. Other key informants thought pesticides were simply inevitable due to the conducive warm African climate and the increased use of hybrid seed and exotic livestock breeds.

Key informants in both study areas (SLL participants, agro-dealers and local extension staff) raised a concern of the indiscriminate, widespread use of agrochemicals by farmers stating that they pose a significant health, environmental and economic challenges, given their potential implications, the concerns associated with them as well as the cost associated with the agrochemicals.

[26] Kansiime et al., 2019

[27] Malambo et al. 2019

[28] Rwomushana et al. 2019

6.1 STAKEHOLDER PERSPECTIVES ON MAIN ISSUES AROUND PESTICIDE

Several issues emerged from the SLLs and key informant interviews. They are summarised in the sub sections below.

6.1.1 Too many pesticide trade names on the market

All the SLLs, and key informant interviews with pesticide imports and with agro dealers highlighted the extensive number of trade names of pesticides on the Zambian market. The farmers cited this as a challenge because it is hard for them to keep track of the pesticides they require for particular crops and pests. In the words of one SLL discussant, "*Every time we go to the agro shops, we find new pesticides. The ones we know are no longer there. We have to keep asking. It is very confusing*." The agro dealers and the importers had similar explanations for this state of affairs. Both explained that the wide array of trade names is because of the many pesticide importers in the country, each of whom imports several pesticides. In the words of one agro dealer typifying this view, "*we buy from several importers, so we end up with pesticides with the same active ingredient trading under different names. We cannot control this*". Three key informants justified the large diversity of pesticides as being necessary for minimising pesticide resistance. They explained that long term use of the same pesticides leads to pesticide resistance, thus the need to vary. Furthermore, crops and livestock are not attacked by the same pests, and their management requires different pesticides, they explained. The stage of development of the crop is also important. For instance, a very immature crop may require a pesticide with a long residual effect while a crop that is mature and due for consumption would need a contact pesticide that wears off in a few days. The key informants contended that having a large array of pesticides is not a problem provided the pesticides are used appropriately and correctly, that is, the right active ingredient used in correct dosage and applied at the right time.

6.1.2 Pesticide resistance is increasing

During the SLL, the farmers expressed concern over increased pesticide resistance. This concern was echoed by agro dealers, importers and public agencies key informants. The farmers observed that pesticides become ineffective after a few seasons and lamented that they have to buy more toxic pesticides and apply higher concentrations than recommended to get any effect. A few farmers attributed the increased pesticide resistance to climate change and elaborated that higher temperatures and reduced rainfall had created conducive environments for pests such as fall army worms. Key informants, an academic and two importers asserted that pesticide resistance is in part due to poor storage and wrong dosage of pesticides used by farmers. They further noted that pests were adapting to the environment, and this was made conducive by the under application of pesticides by farmers, coupled with poor agronomic practices. The misapplication of pesticides was similarly mentioned in one SLL for women who asserted that some farmers used pesticides arbitrarily. For instance, cotton pesticides were applied on rape.

6.1.3 Agro dealers and farmers lack adequate knowledge for pesticide use and disposal

Agro dealers, importers, academics and public sector agricultural experts noted that smallholder farmers did not usually have the correct knowledge on pesticide use and disposal. Several agro dealers explained that farmers tend to stick to their practices. For instance, if they know of a pesticide because it was given to them through contract farming or a project, they insist on using that pesticide even though it may not be suited to their present pest problem. They claimed that farmers were reluctant to switch to other pesticides with the same active ingredient because they tend to know trade names. Correct application of pesticides by farmers was reported to be a problem; farmers under-apply pesticides when they want to stretch them over a larger acreage than recommended or they overdose when they want to deal with persistent pests. Some of the key informants raised concern over the low use of correct protective equipment among smallholder farmers and what they deemed as "*very poor attitude*" towards disposal of empty pesticide containers.

During the SLL discussions in Mumbwa, one of the discussants confessed that "*normally, we don't follow instructions, we spray today, on the bottle's label it says 14 days, people do harvest before 14 days, for selling or personal consumption which results into people getting diarrhea*". Further probed as to why they don't follow instructions, the discussant revealed that "*farmers say it doesn't kill, it doesn't kill… what we are saying is what we know*," as the prevailing situation (reality) on the ground amongst farmers. Some farmers further explained that people are mishandling pesticides because most of their harmful effects is not experienced immediately, they are exposed but later on life.

The SLLs revealed that many of the discussants have inadequate and incorrect knowledge on the disposal of the empty containers of pesticides. Farmers are using the empty containers of pesticides as salt sellers, cut cups or bottles for local brewed beer as well as containers to store water. Those who do dispose of, rather than continue using, pesticide containers reported: "*I burn them*", "*I bury them*", "*I throw them in the pit latrine*" and "*I punch some holes in the containers and leave them in the field*". The interviews with agro dealers also revealed the incorrect knowledge on the disposal of pesticide containers.

All the stakeholder groups interviewed mentioned the important role that agro dealers play in providing free advisory services to farmers that walk into their shops but also expressed concern over the lack of regulations on employing qualified staff to advise farmers. Several key informants noted that operating agro shops was merely business for owners and they aimed to minimise costs by employing unqualified staff. During the fieldwork for this report, only 2 out of the 16 agro dealers interviewed had formal agricultural training. The rest had learnt whatever they knew about pesticides on the job. Two key informants noted that although pesticide importers periodically provided trainings to agro dealers, most did not attend. In cases where they did attend, it was largely the agro shops owners, and not their workers yet it is their workers that attend to farmers on a daily basis. As exemplified by the narration of one importer, "*when we conduct training, farmers come out in full force, but agro dealers are a problem. They do not come. They do not employ qualified agronomists. They employ cheap labour. I*

recently overheard an agro dealer giving wrong advice to a farmer over the use of aluminium phosphide. I immediately intervened and asked to speak to the owner. After my conversation with the owner, the worker was asked to remove the highly hazardous pesticide from the shelves. I suspect this was just for my benefit and the aluminium phosphide was back on the shelves the minute I left the place".

During the SLLs with community agro dealers, several of them had incorrect knowledge on the use of several common pesticides, including the highly hazardous ones. It seemed that the incorrect knowledge partly stemmed from training they had attended, provided by various farmer-oriented organisations. One importer observed that there is no clear mandate on how to dispose of pesticide containers. He was convinced that this lack of mandate or regulation contributes to the indiscriminate disposal of pesticide containers.

6.1.4 Highly hazardous pesticides are sold cheaply and are too easily accessible

Field visits by the team to over 20 agro shops revealed that highly hazardous pesticides are easily accessible to the general public. Only two out of the agro dealers interviewed claimed not to sell highly hazardous pesticides to any walk-in customer and explained that such sales are restricted to large scale commercial farmers, because "*it is known that they have qualified staff that know how to use, store and dispose of highly hazardous pesticides*". Majority of the agro dealers claimed to ask questions to farmers to assess their knowledge, before selling them any highly hazardous pesticides. For example, in the case of aluminium phosphide, questions were about where the grain was stored (whether or not it was in a separate structure or same housing unit as family slept in); how the pesticide was applied; and how/where its container was disposed of. The agro dealers intoned that such questions were meant to ensure that such pesticides were not misused. The team however noted that some agro dealers did not have the correct knowledge themselves and advised their clients to wrap the aluminium phosphide tablets into a cloth before inserting the cloth into bags of maize. Given that the pesticide releases the highly toxic prophine gas on exposure to air, such a strategy does not protect the user and other exposed persons from it. Furthermore, the stakeholders, including farmers themselves, acknowledged that very few smallholder farmers adhere to the prescriptions on use of highly hazardous pesticides. For instance, even though they may know that maize that has been exposed to aluminium phosphide should not be consumed for at least six months, they routinely overlook this, with the justification that "*when we run out of food, we do not care about any non fatal illnesses that result from consuming maize likely to cause poisoning*". However, anecdotal reports from the field suggest cases of fatalities and serious illnesses. The key informant from the Ministry of Health confirmed that cases of pesticide poisoning were common.

In Zambia, headaches, skin itching, dizziness, eye irritations, sneezing, difficulty in breathing, diarrhoea and stomach aches are some of the most common health symptoms reported by farmers as a result of mishandling of pesticides.[29] Long-term exposure to

[29] Tambo et al., 2021; Malambo et al., 2019; Rwomushana et al., 2019

pesticides has been linked to chronic health issues such as neurological disorders, hormonal imbalances, reproductive problems, and certain types of cancer.

Contrary to regulations, aluminium phosphide is sold by the tablet, at between ZMW1 and ZMW2, rather than by the container, which costs above ZMW250. This makes it cheaply accessible (Figure 3).

Figure 3. Display of Aluminium phosphide on sale in an agro shop, Chipata, Zambia.

During SLLs, farmers observed that they found it less laborious to use this highly hazardous pesticide compared to the less hazardous pesticides available on the market. This view was echoed by a key informant from the Ministry of Agriculture who narrated that with non-toxic herbicides such as Shumba, farmers have to unpack the cereal grains from the sacks, add the pesticides after measuring it out, mix thoroughly, place grains back into the sacks and then sew them shut. The drudgery associated with these tasks motivates farmers to use the more toxic pesticides. The highly hazardous pesticides also serve a dual purpose of killing rodents and keeping snakes away. One importer reported that her company has strict in-house rules on what pesticides can be sold to small scale farmers with clear restrictions on some highly hazardous pesticides only sold to commercial users.

6.1.5 Current ZEMA mandate is too wide for efficient pesticide management

Agro dealers and importers interviewed observed that they underwent periodic inspections by ZEMA, the Patents and Company Registration Agency (PACRA) and local authorities. For agro dealers licenced to distribute veterinary products, such inspections included visits from the Zambia Medicines Regulatory Authority (ZAMRA). Both stakeholders noted that they received much fewer visits from ZEMA

compared to the other agencies. They attributed this to ZEMA having a very lean structure which was not commensurate with its mandate. One importer called upon ZEMA to engage in nationwide and frequent training of farmers in pesticide management but noted that it was not possible given its current limited staff. Another importer narrated her experiences with ZEMAs as follows, "*The person assigned to deal with my region is overwhelmed. He has too much to do. This delays the assessment for import permits. Even though we are given receipts to use while waiting for the permit, this only applies for two months. After that, we have to wait for the permit. This delays us. We are a business. Our business is time sensitive. I have a consignment of pesticides which arrived three months after the client wanted it delivered. The client refused to get it. We are stuck with it*". A key informant from the Ministry of Agriculture noted that ZEMA's lack of presence in every district was a big challenge as it left agro dealers to their own devices. During some SLLs, farmers complained that ZEMA was not "*on the ground to inspect*". This, they averred, led to agro dealers employing unqualified staff who are unable to understand the wide range of pesticides they stock.

6.1.6 Ninety-day import permit period disadvantages pesticide importers

Importers require import, distribution, and storage permits. The import permits are valid for three years. Once the application is submitted, a period of 90 days is provided for the permit to be issued. Some importers complained that this period negatively impacted their businesses, especially during peak periods. They elaborated that their clients required quick supplies of pesticides for their business and missing one season meant risking the pesticides expiring on the shelves as Zambia only allows an expiry period of 24 months to be indicated on pesticides. Two of the importers shared experiences of late delivered pesticides being kept in their warehouses until they expired, and then having to pay for their incineration.

7 Reflections on Multi-Dimensional Poverty and Programme Potential

7.1 POVERTY IN TERMS OF RESOURCES

The prevalence of subsistence farming is a major contributor to poverty in Zambia. Traditional gender roles, confirmed in the SLLs, leave males are in charge of marketing cash crops and purchasing inputs, while women are in charge of agriculture. Poor farmers rely on outdated techniques and inadequate equipment, making them susceptible to weather shocks like droughts and floods and crop losses to pests.

Lack of access to resources is a significant contributor to poverty for smallholder farmers in the Mumbwa and Chipata Districts. The current use of pesticides has negative consequences on resources, which exacerbates the problem of poverty. Pesticide misuse or overuse can lead to biodiversity loss, water pollution, crop failure, and soil erosion. Smallholder farmers generally rely on natural resources for their sustenance, making it more difficult for them to use sustainable farming practices when these resources are polluted or depleted.

Improved access to and understanding of appropriate use of pesticides have the potential to address the resource dimension of poverty (as one of many needed interventions).

7.2 POVERTY IN TERMS OF POWER AND VOICE

Significant inequality exists in Zambia, which limits the voice and power of the poor. Uneven chances for political engagement and access to powerful positions are created by differences in education, culture, and income, notably affecting vulnerable groups like women and the less educated. To achieve inclusive and equitable development outcomes, people and communities must be able to voice their concerns, understand the context in which they live (such as the pro's and con's of pesticide use) and take part in the decision-making process.

Power disparities frequently make poverty-related inequality worse and limit the agency of marginalized groups, including smallholder farmers. Information is power and opportunities for smallholder farmers to influence the laws and policies that affect their way of life are influenced by the level of their understanding of the agricultural production on which they depend – including pesticides and their use and effects.

Giving smallholder farmers access to knowledge and information has the potential to boost their power and voice. When farmers have timely access to appropriate information regarding agricultural practices, cost-benefits of pesticides, market trends, and policy developments, they are better able to make informed decisions, negotiate fair prices, and adapt to changing conditions. By enhancing extension services, providing farmer training programs, and employing digital technology, to support such

access the knowledge and information gaps can be reduced. Farmers will be able to actively take part in influencing their farming practices and fighting for their demands thanks to this.

Given that information about pesticides is currently almost exclusively provided by the agro-dealers, women risk being disadvantaged by traditional gender roles where primarily men interact with agro-dealers. As these roles are likely to persist, pesticide information distribution systems need to consider how to reach female users – even if they do not visit agro-dealers.

7.3 POVERTY IN TERMS OF OPPORTUNITIES AND CHOICE

The majority of Zambians especially those who live in poverty, have limited access to options and opportunities. Poverty limits choice and persists through generations, impeding opportunities for employment, education, and decent living conditions.

Pesticide use has risks and potential. Improved understanding of the positive and negative effects would allow women and men living in poverty to make better informed choices. This would allow them to consider short versus long term effects on their food production as well as their market opportunities.

The accessibility of agricultural knowledge and best practices is crucial to enhancing choice. Availability of such information in a language one understands is necessary for choice to be possible. In a culture where males are more likely to have longer schooling (and thus more likely to understand English), the lack of local language labelling and instructions for use on pesticide packaging has significant gender implications.

7.4 POVERTY IN TERMS OF HUMAN SECURITY

Zambia is, broadly speaking, a peaceful country, despite very high income inequality. In consequence, the risk of violence as a contributor to poverty is relatively low. The evaluation team only came across one context where misuse of pesticides may increase tensions to the point of violence: small-holder farmers in one province, having over-exploited their land and damaged the soil with inappropriate pesticide use, where described as migrating to new lands in. Repeating the misuse of pesticides in their new settlements, they were killing off the population of bees in the new areas, bees upon which local honey producers were dependent.

7.5 PROGRAMME POTENTIAL IN RELATION TO POVERTY

Small-holder resources are directly related to the productivity of their land. To the extent that better regulation and chemicals management affect either the productivity of the land or reduce the health risk (and thus productive capacity) of household members, ZEMA activities are likely to influence the resources available to poor farming households.

Poor people's power and voice is dependent on their understanding of the decisions being made that influence their lives. A better understanding of the trade-offs inherent in pesticide use will allow poor farming households to make better choices concerning which decisions they invest in influencing. ZEMA's choices concerning *how* pesticide information is distributed may empower or disempower the people living in poverty; for example, using agro-dealers or lead farmers or local language radio or mobile apps as dissemination channels will have radically different effects on power and voice of the poor.

Opportunities and choices of people living in poverty are inherently limited. Clarifying the choices that exist by providing trustworthy information about pesticides and their alternatives allows more informed choices. In some cases (such as HHPs) limiting choice in the face of limited capacity to safely use may reduce poverty by avoiding negative side-effects.

Social tension escalating to violence is an example of an extreme negative side effect. To the extent that pesticide use damages eco-systems, land or water resources, such use can escalate threatening human security. Climate change, by accelerating variation and the speed of change, increases the risk the population groups feel threatened by neighbours' influence on their environment, for example through misuse of pesticides.

8 Conclusion

8.1 VALIDITY OF THE THEORY OF CHANGE

The assumptions identified include:

1. ZEMA management ensures staff have time, mandate and relevant positions in the organization to develop technical guidelines and standard operation procedures.
2. The work within the FAO supported project on highly hazardous pesticides (HHPs) progresses to serve as basis for proposal development to phase out HHPs.
3. IT hardware and a digital platform are available at ZEMA to enable inclusion of a pesticide registration module.
4. Identification of alternative products/methods to HHPs progresses, alternatives are available and accepted among extension officers and farmers.
5. Political willingness to engage in reforms aimed at systematic and effective control of pesticides that will safeguard human health and environment.

The greatest threat to the validity of these assumptions is the incentives structure and related effects on staff turnover.

Despite that the evaluation concludes that the assumptions in general are valid (with programme adaptations made) and therefore sees the Theory of Change logic as confirmed by available evidence. The programme is likely to have an impact on the core challenges it seeks to address.

8.2 RELEVANCE

Programme design addresses needs and risks with clear implications for population welfare, targeting highly vulnerable people. It is in line with current Zambian policies and is contributing to legal and policy development. The programme is also in line with Sweden's strategy for Zambia 2018-2023.

Appropriate implementation (i.e. use of the research, capacity built as well as draft regulations and guidelines) is likely to contribute to the overall objectives by minimising risks from pesticides to human health and the environment. The programme has the potential to have an effect on multidimensional poverty.

The evaluation concludes that the programme is highly relevant.

8.3 COHERENCE

The programme builds logically and coherently on previous multi-year Swedish support to the sector.

The programme is fully integrated with Zambian governance structure and implemented by the mandated government agency. The design of activities and staff behaviour in implementation show good understanding of stakeholders that are active in the pesticides sector and their respective roles and mandates, as evidenced for example by established technical working groups with participation from multiple stakeholders and training for counterparts in other agencies.

Respect for the developing policy context, while delaying implementation, has allowed broad anchoring of the regulatory changes needed and has kept ambition levels in line with political development in the sector.

The evaluation team lacks sufficient data to assess programme coherence with other support provided to ZEMA.

The evaluation concludes that the programme is coherent.

8.4 EFFECTIVENESS

Implementation of many of the planned activities have been significantly delayed. The causes range from the effects of Covid to prolonged parliamentary processes related to the amendment of the Environmental Management Act, which defines ZEMA's mandate.

ZEMA and KemI have adapted the work plan to a dynamic context. In the face of delays, programme resources have been used to identify institutional gaps and prepare alternatives actions, developed relationships with relevant stakeholders and practical steps to be taken if/when parliament mandates the agency to proceed.

The evaluation notes that the cumulative effects of multi-year cooperation between Sweden and Zambia in the sector (regional work, introducing GHS, ITPs, etc) are difficult to delineate from the current technical assistance programme.

The evaluation concludes that the programme has not achieved its objectives. However, in a difficult context, the programme has been adaptive, productive and has effectively prepared for rapid implementation of changes necessary to achieve the intended objectives – once ZEMA is mandated to do so.

8.5 EFFICIENCY

The bulk of the budget is related to pre-defined costs the programme management cannot control (KemI staff costs and overheads, Zambia government standardised allowances, travel regulations etc.). Delays in implementation have resulted in significant underspending compared to the budget. The evaluation team has not had access to data allowing a benchmarking of the programme's efficiency.

The evaluation team notes high staff turnover in ZEMA broadly. This is likely to have affected the efficiency of capacity building undertaken.

8.6 SUSTAINABILITY

ZEMA is a mandated government agency with a budget for the implementation of the programme.

If/when the amendment of the EMA is passed by parliament, the agency will be tasked and mandated to implement permanent regulatory changes.

The technical advisory services provided by the programme are fully integrated into the operational plan of ZEMA.

ZEMA encounters challenges in recruiting and retaining staff. This lessens the sustainability of the capacity development undertaken.

The evaluation concludes that the programme's individual and institutional capacity building effects are sustainable. The evaluation further concludes that expected legal and regulatory effects are likely to be sustainable.

9 Lessons Learned

The evaluation team wishes to highlight the following lessons learned as applicable in other programming:

- Incentive structures always have side effects and at times these hinder and institution from reaching its goals. The example from ZEMA is the field allowance which is important to the staff members concerned. As this is only paid for service in the field, staff are disincentivised from investing in developing desk-based specialisations needed by the agency such as the technical skill to assess the risk of pesticides.

- Specialist technical agencies are needed and mandated to understand and develop regulations and tools for particular challenges; for example, how to manage pesticides. This does not mean they have the resources to implement through inhouse staffing when implementation needs to be nationwide (Control of agro-dealers, disposal of containers, training of farmers). Broader line ministries (Agriculture, Health, Local government) have nationwide local representation. There is a need for cross ministerial collaboration to implement specialist advice. Such collaboration should include the possibility of devolving tasks (regular inspections, farmers training, water testing etc) to agencies that have a permanent local staff presence following appropriate training by the specialist agency.

- Lack of local language instructions/labelling is a serious problem. New technology opens up for cheaper, app -based, distribution of instructions in local languages without incurring high printing and distribution costs.

10 Recommendations

Recommendations to Sida:

- Provide a no-cost extension to the programme to allow for the regulatory work undertaken to be finalised, if ZEMA is mandated to do so with the passing of the amendment of the Environmental Management Act. First step would be the regulatory impact assessment.
- Consider a second phase, emphasizing implementation in relation to end beneficiaries. This would entail developing partnerships with a series of stakeholders (other ministries, importers, local institutions, NGOs and other private sector associations).
- Discuss the potential for support from other Swedish agencies (for example, but not limited to, the Swedish Civil Contingencies Agency (MSB) for response preparedness)

Recommendations to KemI:

- Participate in a no-cost extension to the programme to allow for the regulatory work undertaken to be finalised, if ZEMA is mandated to do so with the passing of the amendment of the Environmental Management Act. First step would be the regulatory impact assessment.
- Consider a second phase, emphasizing implementation in relation to end beneficiaries (refer Sida recommendation above). With reference to the limitations on ZEMA resources and the second lesson learned, which emphasises the need for cross ministerial collaboration in such implementation (ref section 9), KemI could potentially contribute by sharing Swedish experience on the complexity and practicalities of such interaction.

Recommendations to ZEMA:

Institutionally:

- Further develop collaboration with line ministries with local presence nationwide. If legal, identify tasks that can (and should) be devolved to them (after appropriate technical training).
- Explore how the incentives system can be adjusted to address the concerns regarding developing and retaining specialists.
- Mandate a QR code on labels. Mandate that the QR code provides information in the seven main local languages on active ingredient, use, risks and disposal of containers and unused/expired pesticide.

In future implementation:

- Create awareness about pesticide resistance and encourage further research on why this occurs.

- In the licensing system for pesticide sellers, minimum standards for staff competence and quality of information given should be raised and better followed-up (compare role of veterinary assistants in distributers of veterinary supplies).
- Prohibit the worst HHP. For permitted HHPs, explore if sales can be limited to farmers that pass an app-based "exam" on how the chemical should be used (linking sales to application competence, not size of farm).
- Prescriptions should be required when buying highly hazardous pesticides. Such prescriptions could be issued by camp officers.
- The subsidiary legislation on extended producer responsibility should be applied to pesticide importers by placing a charge on pesticide containers, which would be redeemable. This would go a long way in ensuring that “every container that goes out comes back”

Annex 1 – Terms of Reference

Template version: 2020-11-25

Terms of Reference for the Midterm Evaluation of the Bilateral cooperation between Zambia Environmental Management Agency (ZEMA) and the Swedish Chemicals Agency (KEMI) on pesticide management

Date: 27.02.2023

1. General information

1.1 Introduction

Pesticides and agrochemicals have become important components of worldwide agricultural systems during the last century, allowing for a noticeable increase in crop yields and food production. As a result, farmers are increasingly adopting the use of chemicals in the management of disease and pest infestation. The unfortunate reality is that a considerable proportion of pesticides used in the world are considered highly hazardous. Without safe management practices, these chemicals and their hazardous wastes can pose significant risks to both the environment and human health, especially the poorest members of the global community. In urban areas, low-income populations are often exposed to hazardous chemicals and associated wastes through their jobs. In rural areas, most chemical exposure and environmental pollution is linked to the misuse of agricultural chemicals and pollution brought by waterways, impacting the natural resources upon which these communities depend. Putting in place measures aimed at reducing the risk of exposure to chemicals should therefore be considered a priority.

The Embassy of Sweden has supported partners working on increasing agricultural production and productivity among small-scale farmers through use of improved technologies, including the use of pesticides. These partners, such as Musika and iDE, among other things, promote the establishment and growth of community agro

dealers who sell chemicals and provide spray services. The partners have conducted several trainings on safe use of pesticides to agro dealers and farmers. However, given the side effects and risks associated with increased use of chemicals in agricultural interventions, the Embassy of Sweden decided to support an intervention that would further avert and mitigate the negative effects of chemical use on both human health and the environment.

The Embassy first supported the Swedish Chemical Agency (KEMI), to develop a technical assistance project with the Zambia Environmental Management agency (ZEMA). The outcome from this support was a project proposal for Bilateral cooperation between ZEMA and KEMI on pesticide management. The Embassy thereafter signed a grant Arrangement with KEMI to support the KEMI Technical Assistance to ZEMA on Pesticide Management intervention for the period 1st June 2020 to 31st December 2023. The total value of the Arrangement is Eleven Million Five Hundred Thousand Swedish Kronor (SEK 11,500,000) out of which Seven Million and Seventy-Eight Thousand (SEK 7,078,000) was disbursed. The Embassy is the sole donor for the cooperation, but KEMI has other projects funded by Sida at bilateral and global level as well as cooperation with selected strategic countries with funding from the Ministry of Climate and Enterprise.

The project suffered a slow start and progression in implementation due to Covid 19 impacts and delayed approval of contract terms and conditions by the Ministry of Justice in Zambia.

1.2 Evaluation object: Intervention to be evaluated

The evaluation object is the Bilateral cooperation between KEMI and ZEMA on pesticide management, which is three years and 6months (6months being an inception Phase)]project being implemented by KEMI.

The Bilateral cooperation aligns with Sweden's strategy for Zambia 2018-2023 and is expected to contribute to the attainment of two strategy goals of Strategy Area 3; (Environment, Climate, Renewable Energy and Sustainable, Inclusive Economic Development and Livelihood) which are: a) Sustainable use of natural resources, increased sustainable productivity and production in agriculture, and increased resilience to climate change; and b) Improved opportunities for sustainable livelihoods, with a focus on productive employment with decent working conditions, particularly for women and young people. The cooperation also contributes to one strategy goal in the Strategy Area 1 (Human rights, democracy, the rule of law and gender equality) which is Strengthened capacity in public institutions, including capacity to mobilise additional actors and resources for sustainable development.

The overall objective of the proposed collaboration is to contribute to increased institutional capacity and better practices for the management of pesticides to safeguard human health and the environment. The following outcomes are expected to contribute to the overall objective:

a) A revised registration process for pesticides in Zambia to support registration of efficacious products that will not cause unacceptable harm to human health and the environment is established and the capacity of ZEMA staff and other relevant institutions has increased.

b) ZEMA's management of highly hazardous pesticides has improved.

c) an IT system for registration of pesticides is established and the information on ZEMA's website is further developed.
The direct beneficiaries of the technical assistance are ZEMA staff who are receiving advice and training related to pesticide management. Downstream beneficiaries of this cooperation are people being exposed to highly hazardous pesticides in several ways, especially small-scale farmers belonging to a group that is particularly vulnerable with limited opportunities to protect themselves when handling pesticides. Companies importing and distributing pesticides will also benefit from the cooperation by facilitated access to relevant information as well as more effective working procedures at ZEMA. Other ministries and agencies in Zambia will equally benefit from improved capacity and working practices at ZEMA.

1.3 Evaluation rationale

The ZEMA - KEMI cooperation has been under implementation since early 2021. A midterm evaluation was planned for early 2022 to assess project performance, identify areas of improvement including recommendations for the remainder of the agreement. However, due to Covid 19 and other institutional challenges the cooperation suffered a delayed start. The mid-term evaluation was therefore, postponed for 12 months to allow the project to gain some ground in terms of implementation. The slow start and pace of project implementation corresponds to slow rate of funds consumption. The Embassy, therefore, is open to considering a no cost extension to the project period to enable the project to consolidate its results. An evaluation is therefore best suited for this period. It will allow for some reasonable assessment of project implementation and also gives direction on what the project should focus on during the final and extended period of the agreement as well as beyond the project.

2. The assignment

2.1 Evaluation purpose: Intended use and intended users

The purpose or intended use of the evaluation is to help The Embassy, ZEMA and KEMI assess progress of the on-going bilateral cooperation and learn from what works well and less well. The evaluation will be used to inform decisions on how project implementation may be adjusted and improved and priorities for any potential future support..

The primary intended users of the evaluation are KEMI, ZEMA and the Embassy of Sweden in Lusaka (DCD).

The evaluation is to be designed, conducted, and reported to meet the needs of the intended users and tenderers shall elaborate in the tender how this will be ensured during the evaluation process. Other stakeholders that should be kept informed about the evaluation include other interested parties like the wider donor community and the academia who may want to utilise the results of the evaluation are potential secondary users of the evaluation.

During the inception phase, the evaluator and the users will agree on who will be responsible for keeping the various stakeholders informed about the evaluation.

2.2 Evaluation scope

The mid-term evaluation will cover implementation activities of the Bilateral cooperation from inception to present date and the scope of the evaluation is the whole Bilateral cooperation. The evaluation will focus on activities as agreed with the Embassy of Sweden and as indicated in the Bilateral cooperation proposal . For further information, the Bilateral cooperation proposal is attached as Annex D. The scope of the evaluation and the theory of change of the project shall be further elaborated on by the evaluator in the inception report, if deemed necessary.

2.3 Evaluation objective: Criteria and questions

The objective/objectives of this evaluation is/are to:

- Evaluate the relevance, effectiveness coherence and efficiency and sustainability of the technical assistance to ZEMA and formulate recommendations on how its management team can improve and adjust implementation.
- Evaluate the relevance, effectiveness coherence and efficiency and sustainability of the technical assistance to ZEMA and formulate recommendations as an input to potential discussions concerning a new phase of the intervention.

The evaluation questions are:

Relevance: Is the intervention doing the right thing?

- To what extent has the intervention objectives and design responded to partner/institution needs, policies, and priorities, and have they continued to do so if/when circumstances have changed?
- To what extent have lessons learned from what works well and less well been used to improve and adjust intervention implementation?

Coherence: How well does the intervention fit?

- How compatible has the intervention been with other interventions in the country, sector, and organisation where it is being implemented?

Effectiveness: Is the intervention achieving its objectives?

- To what extent has the intervention achieved, or is expected to achieve, its objectives, and its results, what are the reasons for the achievement or non-achievement of objectives and what lessons can be learnt from these?.

Efficiency: How well are resources being used?

- To what extent has the intervention delivered, or is likely to deliver, results in an economic and timely way?
- What measures have been taken during planning and implementation to ensure that resources are efficiently used?

Sustainability: Will the benefits last?

- To what extent will the net benefits of the intervention continue, or are likely to continue?

Questions are expected to be developed in the tender by the tenderer and further refined during the inception phase of the evaluation.

2.4 Evaluation approach and methods

It is expected that the evaluator describes and justifies an appropriate evaluation approach/methodology and methods for data collection in the tender. The evaluation design, methodology and methods for data collection and analysis are expected to be fully developed and presented in the inception report. Given the situation with Covid-19, innovative and flexible approaches/methodologies and methods for remote data collection should be suggested when appropriate and the risk of doing harm managed. The evaluator is to suggest an approach/methodology that provides credible answers (evidence) to the evaluation questions. Limitations to the chosen approach/methodology and methods shall be made explicit by the evaluator and the consequences of these limitations discussed in the tender. The evaluator shall to the extent possible, present mitigation measures to address them. A clear distinction is to be made between evaluation approach/methodology and methods.

A *gender-responsive* approach/methodology, methods, tools, and data analysis techniques should be used[30].

Sida's approach to evaluation is *utilization-focused*, which means the evaluator should facilitate the *entire evaluation process* with careful consideration of how everything that is done will affect the use of the evaluation. It is therefore expected that the evaluators, in their tender, present i) how intended users are to participate in and contribute to the evaluation process and ii) methodology and methods for data collection that create space for reflection, discussion and learning between the intended users of the evaluation.

In cases where sensitive or confidential issues are to be addressed in the evaluation, evaluators should ensure an evaluation design that do not put informants and stakeholders at risk during the data collection phase or the dissemination phase.

[30] See for example UNEG United Nations Evaluation Group (2014) Integrating Human Rights and Gender Equality in Evaluations http://uneval.org/document/detail/1616

2.5 Organisation of evaluation management

This evaluation is commissioned by the Swedish Embassy in Lusaka. The intended users are the Embassy of Sweden in Lusaka, ZEMA and KEMI. The intended users of the evaluation form a steering group, which has contributed to and agreed on the ToR for this evaluation. The steering group is a decision-making body. It will approve the inception report and the final report of the evaluation. The steering group will participate in the start-up meeting of the evaluation, as well as in the debriefing/validation workshop where preliminary findings and conclusions are discussed.

2.6 Evaluation quality

All Sida's evaluations shall conform to OECD/DAC's Quality Standards for Development Evaluation[31]. The evaluators shall use the Sida OECD/DAC Glossary of Key Terms in Evaluation[32] and the OECD/DAC Better Criteria for Better Evaluation[33]. The evaluators shall specify how quality assurance will be handled by them during the evaluation process.

2.7 Time schedule and deliverables

It is expected that a time and work plan is presented in the tender and further detailed in the inception report. Given the situation with Covid-19, the time and work plan must allow flexibility in implementation. The evaluation shall be carried out from 3rd April to 4th August 2023. The timing of any field visits, surveys and interviews need to be settled by the evaluator in dialogue with the main stakeholders during the inception phase.
The table below lists key deliverables for the evaluation process. Alternative deadlines for deliverables may be suggested by the consultant and negotiated during the inception phase.

Deliverables	**Participants**	**Deadlines**
1. Start-up meetings (Virtual)	Embassy of Sweden, KEMI, ZEMA	3rd April 2023
2. Draft inception report	Evaluators	Tentative 28th April
3. Comments from intended users to evaluators]	Embassy of Sweden, KEMI, ZEMA	Tentative 15th May
4. Fina Inception Report	Embassy of Sweden, KEMI, ZEMA	26th May

[31] OECD/DAC (2010) Quality Standards for Development Evaluation.

[32] Sida OECD/DAC (2014) Glossary of Key Terms in Evaluation and Results Based Management.

[33] OECD/DAC (2019) Better Criteria for Better Evaluation: Revised Evaluation Criteria Definitions and Principles for Use.

5. Data collection, analysis, report writing and quality assurance	Evaluators	30th June
6. Draft evaluation report	Evaluators,	4th July
7. Comments from intended users to evaluators	Embassy of Sweden, KEMI, ZEMA	21st July
8. Final evaluation report	Evaluators	4th August

The inception report will form the basis for the continued evaluation process and shall be approved by Sida before the evaluation proceeds to implementation. The inception report should be written in English and cover evaluability issues and interpretations of evaluation questions, present the evaluation approach/methodology *including how a utilization-focused and gender-responsive approach will be ensured*, methods for data collection and analysis as well as the full evaluation design, including an *evaluation matrix* and a *stakeholder mapping/analysis*. A clear distinction between the evaluation approach/methodology and methods for data collection shall be made. All limitations to the methodology and methods shall be made explicit and the consequences of these limitations discussed.
A specific time and work plan, including number of hours/working days for each team member, for the remainder of the evaluation should be presented. The time plan shall allow space for reflection and learning between the intended users of the evaluation.
The final report shall be written in English and be professionally proofread. The final report should have clear structure and follow the layout format of Sida's template för decentralised evaluations (see Annex C). The executive summary should be maximum 3 pages.
The report shall clearly and in detail describe the evaluation approach/methodology and methods for data collection and analysis and make a clear distinction between the two. The report shall describe how the utilization-focused approach has been implemented i.e., how intended users have participated in and contributed to the evaluation process and how methodology and methods for data collection have created space for reflection, discussion and learning between the intended users. Furthermore, the gender-responsive approach shall be described and reflected in the findings, conclusions, and recommendations along with other identified and relevant cross-cutting issues. Limitations to the methodology and methods and the consequences of these limitations for findings and conclusions shall be described. Evaluation findings shall flow logically from the data, showing a clear line of evidence to support the conclusions. Conclusions should be substantiated by findings and analysis. Evaluation questions shall be clearly stated and answered in the executive summary and in the conclusions. Recommendations and lessons learned should flow logically from conclusions and be specific, directed to relevant intended users and categorised as a short-term, medium-term, and long-term.

The report should be no more than 35 pages excluding annexes. If the methods section is extensive, it could be placed in an annex to the report. Annexes shall always include the Terms of Reference, the Inception Report, the stakeholder mapping/analysis, and the Evaluation Matrix. Lists of key informants/interviewees shall only include personal data if deemed relevant (i.e., when it is contributing to the credibility of the evaluation) based on a case-based assessment by the evaluator and the commissioning unit/embassy. The inclusion of personal data in the report must always be based on a written consent.
The evaluator shall adhere to the Sida OECD/DAC Glossary of Key Terms in Evaluation[34].
The evaluator shall, upon approval by the Embassy of the final report, insert the report into Sida's template för decentralised evaluations (see Annex C) and submit it to Nordic Morning (in pdf-format) for publication and release in the Sida publication database. The order is placed by sending the approved report to Nordic Morning (sida@atta45.se), with a copy to the responsible Sida Programme Officer as well as Sida's Evaluation Unit (evaluation@sida.se). Write "Sida decentralised evaluations" in the email subject field. The following information must always be included in the order to Nordic Morning:

1. The name of the consulting company.
2. The full evaluation title.
3. The invoice reference "ZZ980601".
4. Type of allocation: "sakanslag".
5. Type of order: "digital publicering/publikationsdatabas.

2.8 Evaluation team qualification

In addition to the qualifications already stated in the framework agreement for evaluation services, the evaluation team shall include the following competencies

- Master's degree in Environment studies or related.
- Master's degree in Agricultural science or related

It is desirable that the evaluation team includes the following competencies:

- A minimum of 10 years relevant professional experience in monitoring and evaluating donor funded programmes in developing countries, and with the following expertise:
    - Demonstrated experience in working on programmes in the area of chemicals management.
    - Experience in conducting evaluations on institutional development.
    - Strong understanding of the Zambian context, environmental policies, and laws.

[34] Sida OECD/DAC (2014) Glossary of Key Terms in Evaluation and Results Based Management.

A CV for each team member shall be included in the call-off response. It should contain a full description of relevant qualifications and professional work experience. It is important that the competencies of the individual team members are complimentary. It is highly recommended that local evaluation consultants are included in the team, as they often have contextual knowledge that is of immense value to the evaluation. In addition, and in a situation with Covid-19, the inclusion of local evaluators may also enhance the understanding of feasible ways to conduct the evaluation

The evaluators must be independent from the evaluation object and evaluated activities and have no stake in the outcome of the evaluation.

Please note that in the tender, the tenderers must propose a team leader that takes part in the evaluation by at least 30% of the total evaluation team time including core team members, specialists, and all support functions, but excluding time for the quality assurance expert.

2.9 Financial and human resources

The maximum budget amount available for the evaluation is 800,000SEK.

Invoicing and payment shall be managed according to the following: The Consultant may invoice a maximum of 30 % of the total amount after approval by Embassy of the Inception Report and a maximum of 70% after approval by Embassy of the Final Report and when the assignment is completed.

The contact person at Sida/Swedish Embassy is Susan Chipeta, Programme Manager, Market Systems, Employment Creation and Trade. (susan.chipeta@gov.se) The contact person should be consulted if any problems arise during the evaluation process.
Relevant Sida documentation will be provided by Susan Chipeta, Programme Manager, Market Systems, Employment Creation and Trade. (susan.chipeta@gov.se)
Contact details to intended users will be provided by Susan Chipeta, Programme Manager, Market Systems, Employment Creation and Trade. (susan.chipeta@gov.se) and Jenny Ronngren, Senior Adviser, International Unit, Swedish Chemicals Agency (Jenny.Ronngren@KEMI.se),

The evaluator will be required to arrange the logistics such as booking interviews, preparing visits, etc including any necessary security arrangements.

3. Annexes

Annex A: List of key documentation

- Inception phase report
- Annual reports 2021 and 2022

Annex B: Data sheet on the evaluation object

Information on the evaluation object (i.e., intervention)	
Title of the evaluation object	KEMI Technical Assistance to ZEMA on Pesticide Management

ID no. in PLANIt	13038
Dox no./Archive case no.	UM2019/42979
Activity period (if applicable)	1st June 2010 to 31st December 2023
Agreed budget (if applicable)	11,500,000 SEK
Main sector	Environmental policy and administrative management
Name and type of implementing organization	Swedish Chemicals Agency (Kemikalieinspektionen)
Aid type	Project Type
Swedish strategy	2018-2023

Information on the evaluation assignment	
Commissioning unit/Swedish Embassy	Swedish Embassy
Contact person at unit/Swedish Embassy	Susan Chipeta
Timing of evaluation (mid-term, end-of-programme, ex-post, or other)	Mid Term
ID no. in PLANIt (if other than above).	

Annex C: Decentralised evaluation report template
Annex D : Project/Programme document

Annex 2 – Documentation

Dastgeer A, Hansen, A, Jalba, A and Mansson, A B 2017. Evaluation of ITP 299-Strategies for Chemicals Management. Sitrus.

Dastgeer A; Homstro K, and Sen, L T.H 2019 Evaluation of the regional development programme "Towards a Non – Toxic Environment in South – East Asia" phase 11. Stockholm. Nordic Morning.

Kansiime MK, Mugambi I, Rwomushana I, Nunda W, Lamontagne-Godwin J, Rware H, et al. Farmer perception of fall armyworm (Spodoptera frugiderda J.E. Smith) and farm-level management practices in Zambia. Pest Management Science. 2019;75(10):2840-2850.

Malambo, M.J., Mukanga, M., Nyirenda, J., Kabamba, B. and Salati, R.K., 2019. Knowledge and practice of pesticides use among small holder farmers in Zambia. *Int. J. Hortic. Agric. Food Sci*, *3*, p.184.

Manintveld. K, Mitti. J. M and Almekinders. C 2004. Food Crop and Seed project in Zambia. Sida

Nilsson A and Chuzu 2020. Project Review of the Dairy Association of Zambia (DAZ) s Digital Information Management Sysstem (DIMS) project.. Nordic morning.

Regeringskansliet, Swedens strategy for cooperation with Zambia "*Strategi för Sveriges utvecklingssamarbete med Zambia 2018-2022"*, https://www.regeringen.se/contentassets/660126b77cbf4effb71094bff787d206/strategi-for-sveriges-utvecklingssamarbete-med-zambia-2018-2022-layoutad.pdf

Rwomushana, I., Beale, T., Chipabika, G., Day, R., Gonzalez-Moreno, P., Lamontagne-Godwin, J., Makale, F., Pratt, C. and Tambo, J., 2019. Tomato leafminer (Tuta absoluta): impacts and coping strategies for Africa. *Tomato leafminer (Tuta absoluta): impacts and coping strategies for Africa*.

Sabarwal, A., Kumar, K. and Singh, R.P., 2018. Hazardous effects of chemical pesticides on human health–Cancer and other associated disorders. *Environmental toxicology and pharmacology*, *63*, pp.103-114.

Tambo, J.A., Romney, D., Mugambi, I., Mbugua, F., Bundi, M., Uzayisenga, B., Matimelo, M. and Ndhlovu, M., 2021. Can plant clinics enhance judicious use of pesticides? Evidence from Rwanda and Zambia. *Food Policy*, *101*, p.102073.

Thomson A, Chiwele D, Saasa, O and Gibson. S. 2010. Evaluation of the Joint Assistance Strategy for Zambia (JASZ) 2007 – 2010. Ministry of Foreign Affairs of Denmark.

Umar, B.B., Nyanga, P.H. (2022) Customary Land Certification, Governance and Natural Resource Use in Zambia: A Social Learning Approach. European Journal of Development Research. https://doi.org/10.1057/s41287-022-00555-9.

Legal and Policy Documents

Environmental Management (Licensing) Regulations (Statutory Instrument No. 112 of 2013)
Medicines and Allied Substances Act (No. 3 of 2013) and the Medicines and Allied Substances Act (Agro-Veterinary shops) Regulations, 2016.
National Agricultural Policy (2012-2023)
Occupational Health and Safety Act No. 36 of 2010
Water Resources Management Act (No. 21 of 2011)
ZS555: 2006 Handling of Pesticides. Code of Practice

Project Documents

KEMI Bilateral Cooperation between Zambia Environmental Management Agency (ZEMA) and the Swedish Chemicals (kemI) on chemicals management with a focus on pesticides._ 2019.
KEMI Financial report for the Swedish Chemicals Agency Sida financed bilateral cooperation by ZEMA (Zambia) and Kemi. 2022
KEMI General overview of the cooperation between Sida and the Swedish Chemicals Agency 2021
SIDA, Environment and climate change and Dimension of poverty. 2019.
SIDA. Climate and Environment policy. 2022.
SIDA. Human Rights Based Approach at Sida.
ZEMA/KEMI Programme description ZEMA-KEMI_2019
ZEMA/KEMI Progress report ZEMA-KEMI_202O
ZEMA/KEMI Progress report ZEMA -Kemi_2021_FINAL
ZEMA/KEMI Progress report ZEMA-KEMA _2022

Annex 3 - Interviewees by Category and Gender

Stakeholder	No. of Stakeholder Members	Gender Female/Male		Data Collection Method
Small holder farmers rain fed	22	11	11	Social Learning Lab
Pesticide importing permit holder	10	2	9	Semi Structured interviews
Community import suppliers	16	7	9	Social Learning Lab
Cotton Company	1	0	1	Semi Structured interviews
Zambia National Farmers Officials	2	0	2	Semi Structured interviews
Agricultural NGO S Crop life	1	0	1	Semi Structured interviews
Ministry of Agriculture at (Mumbwa and Chipata)	4	1	3	Semi Structured interviews
Agro- dealers	18	11	7	Semi Structured interviews
KemI	1	1	0	Semi Structured interviews
ZEMA staff members (current and former)	7	1	6	Semi Structured interviews
University/Agricultural Research	1	1	0	Semi structured interview
Ministry of Health	1	0	1	Semi structured interview

Annex 4 – Utilisation-focused Evaluation

Please find below the checklist for UFE, as presented in the technical proposal, with minor updates.

Below, the twelve-step version of utilization-focused evaluation (UFE), complemented with step no 8 from Patton[35], is presented with a brief description of the contribution of EoS/KEMI ZEMA and the team to the respective steps. Steps 1 – 9 are part of the inception phase, Step 10 is communication and considerations during the data collection phase and Steps 11 - 13 depict interactions during the analysis and reporting phase.[36]

Step in Utilisation-focused evaluation	Embassy, SNV involvement	Team considerations and actions
Step 1 Assessing program readiness	To what extent do users (managers) at KEMI ZEMA understand UFE and are willing to contribute to it? Start-up meeting positive and indicates interest and willingness to participate appropriately.	Present UFE, describe implications for users, discuss and assess users' degree of involvement and commitment at start-up meeting.
Step 2 Assessing evaluator readiness	Evaluation managers' willingness and ability to commit to UFE clarified. Start-up meeting positive and indicates interest and willingness to participate appropriately.	The evaluation Team Leader and Sr consultant, have substantial facilitation skills,a requisite for UFE.
Step 3 Identifying primary intended users.	Embassy of Sweden, ZEMA, KEMI, others as relevant	Identify primary users' objectives and needs during start-up meeting and workshop. Comments made in start-up meeting have influenced drafting of Inception report.
Step 4 Situational analysis	Contribute information and participate in facilitated discussions. Done	Review of organizational aspects i.e. previous experience from evaluations, resources available for, and priority given to the evaluation (e.g. time). Agree on context.

[35] Patton, 2012, Essentials of Utilization-Focused Evaluation: A Primer. Thousand Oaks, CA: SAGE

[36] The steps and descriptions are based on Ramírez and Brodhead, 2013: Utilization Focused Evaluation A primer for evaluators.

Step 5 Identification of primary intended uses	Identified in the Terms of Reference. Additional information on *how* results will be used (in addition to for *what*)	Facilitation of discussion around intended use. Perceptions; threat or opportunity? Or both? Develop agreement on which stakeholders to be involved/ informed by whom.
Step 6 Focusing the evaluation.	Contribute to fine-tuning evaluation questions and discuss analytical frameworks to use. This is a step where the involvement of ZEMA/KEMI is key.	Adaptation of evaluation methods and questions to information surfaced in above steps, discussions with primary users on what is being assessed; how define success and challenges? Discussions held focused on data collection considering the balance between Lusaka based and Province based stakeholders.
Step 7 Evaluation design	Mainly feedback on inception report. Feedback received from EoS and KemI advisor.	Adapt suggested approach and development of detailed methods and tools to ensure that findings respond to the intended uses and users.
Step 8 Make sure intended users understand potential controversies about methods and their implications.	Active participation in meeting to discuss potential controversies about methods and their implications. Analytical process to prepare active participation. ZEMA and KemI open, welcoming and constructively helpful during data collection.	Explain and discuss potential controversies about methods and their implications with primary users. Facilitate process to ensure these are really understood. Mental preparedness.
Step 9 Simulation of use of findings	Facilitated discussion of use based on fabricated data, to verify that the evaluation will lead to findings that are useable to ZEMA/KEMI.	Produce fabricated findings, facilitate discussion with about the usefulness of these. If needed, modify methods or evaluation questions. Not done
Step 10 Data collection	Be prepared to discuss urgent issues or changes with the team. Adaptations done at times during the evaluation process	Introduce the full country team to UFE and keep attention to issues re use throughout data collection phase. Inform primary users of urgent issues or changes.
Step 11 Data analysis	Participate in and contribute to joint analysis workshop to discuss and interpret initial findings. Suggest areas of additional analysis, if unexpected findings	Prepare and facilitate joint analysis workshop, for presentation of initial findings, discussion of possible conclusions and recommendations. Not done, clashing with travel

	surface. Not done, clashing with travel schedules, leaves and other commitments of the involved people.	schedules, leaves and other commitments of the involved people.
Step 12 Facilitation of use	Develop a dissemination strategy for the evaluation to facilitate use, including planning for the resources needed.	Prepare final report and communicate findings and conclusions that are closely linked to the evaluation purpose, criteria and questions, and prioritise and present recommendations that facilitate use. Draft report submitted
Step 13 Meta-evaluation of use	Participate in and contribute to concluding workshop to assess the evaluation process and especially the users' involvement in the process and potential use of the results of the evaluation.	Prepare and facilitate concluding workshop. Present the team's perceptions regarding the evaluation process, especially regarding the utilization focus of the evaluation. Summarise learning from the process.

Annex 5 – Data Collection Tools

Social Learning Labs

Qualitative data collection may be done individually or by groups. Each sampling choice runs the risk of bias and of descending into data extraction, respondent adaptation to believed preferences of the interviewers and/or accentuating preconceived notions due to focus group discussions being conducted in homogeneous groups.

Umar B.B. and Nyanga P.H. have developed focus group discussions into a structured social exploration tool[37] that brings the added benefit of supporting communication between stakeholders from differing contexts, thus creating a process with the potential to both support data collection and improved communication between subgroups of respondees. The method, which the evaluation team will use (if feasible) at least once per province visited, is based on inviting multiple relevant stakeholders to a joint meeting and involves four distinct phases:

- The introduction phase develops a space for communication respectful of local norms and customs. The researcher takes on the role of "honest broker", she/he is introduced by local leaders, the meeting is initiated in accordance with local customs and the process explained in some detail. The purpose of the research is explained and verbal informed consent requested. The researcher acts as facilitator and asks questions in a neutral, respectful and impartial manner seeking to ensure that every participant is given a platform to express her/his views.
- The identification phase seeks to clarify the issues around which the researchers seeks information about the perspectives of the participants. The researcher presents the themes and supports the development of different stakeholders' perspectives on how he/she has been affected by the activities of associated changes that have taken place. The themes developed are supported by the semi-structured evaluation questions matrix guiding the overall data collection.
- In the assessment phase changes identified are assessed to be positive or negative on a graded scale and each discussant is encouraged to suggest a score. Group discussions are encouraged based on the suggestions, seeking to arrive at a consensus, if possible. Issues are clustered to highlight interconnectedness and the group is encouraged to discuss possible ways of addressing challenges encountered.
- The section concludes with a final reflection phase at this stage discussant are asked to reflect on what they have learnt from other stakeholders in the earlier phases. The purpose of dual, to see what the group highlights on reflection and to encourage stakeholders to reflect on the perspectives of the other participants.

The researcher then documents the session in a similar way to what would have been done after a focus group discussion.

[37] The above summary is based on the methodological description from *Customary land certification, governance and natural resource use in Zambia: A social learning approach,* The European Journal of Development Research, Manuscript draft 2022

Midterm Evaluation of the Bilateral cooperation between Zambia Environmental Management Agency (ZEMA) and the Swedish Chemicals Agency (KEMI) on Pesticide Management

This mid-term evaluation assessed the "Bilateral cooperation between Zambia Environmental Management Agency (ZEMA) and the Swedish Chemicals Agency (KEMI) on pesticide management". This collaboration implemented by KEMI aimed to contribute to increased institutional capacity and better practices for the management of pesticides to safeguard human health and the environment. Despite significant delays including Covid and parliamentary processes related to the amendment of the Act which governs ZEMA's mission and mandate, the evaluation concludes that the programme is highly relevant, in line with strategies, policies and needs of both Zambia and Sweden. Albeit not achieving its objectives, the program has, in a difficult context, been adaptative and productive and has prepared for rapid implementation once ZEMa is mandated to do so. The evaluation team provided separate recommendations to KEMI, ZEMA and Sida. Those include the provision of and participation in a no-cost extension, to allow for the work undertaken to be finalised, as well as the consideration of a second phase, emphasizing implementation in relation to end beneficiaries.

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