

**Project Evaluation Series
02/2020**

**Final Evaluation of
“Demonstration project for the
Decontamination of Persistent
Organic Pesticides Contaminated
Soils using Non-thermal Treatment
Methods”**

**Project code: GCP/BOT/011/GFF
GEF ID: 3985**

Annex 3. Table of project outputs

Annex 3: Table of Project Outputs

Project Output	Targets for end of the project (from Pro Doc)	Results obtained from the review of project documents & stakeholder interviews
1.1.1. Characterization of type and level of contamination	<p>Conceptual model and sampling plan confirmed. Intrusive environmental investigation conducted.</p> <p>Analytical methods and laboratory requirements selected.</p>	<p>(75%) Five potentially contaminated sites were inspected. This confirmed that only two sites (Sebele and Kasane) were contaminated and required further investigations¹.</p> <p>Further sampling confirmed that contamination at Kasane is negligible and does not require remediation. ²</p> <p>25 tons of POPs and obsolete pesticides and 35 tons of contaminated seed identified and centralized at Sebele³</p>
1.1.2. Inventory of existing stocks	Stocks inventoried & sites prioritized according to risk	<p>(100%) Inventories completed ¹</p> <p>One site at Sebele was selected for bioremediation⁴</p>
1.1.3. Inventory of contaminated containers	The risk posed by all POPs and pesticide waste assessed and interventions prioritized	<p>(50%) All obsolete stock including contaminated containers were inventoried and centralized at Sebele warehouse¹</p>
1.2.1. Environmental assessment complete for all wastes	Soil and groundwater environmental assessments completed and EMPs for sites that were to be dealt with by the project confirmed.	<p>(100%) EA for obsolete pesticides complete ^{1, 4}</p>
1.2.2. Environmental management plan completed for obsolete stocks and containers	Appropriate remediation technique(s) assessed.	<p>(100%) EMP for obsolete pesticides complete. Feasibility study for container management prepared⁵ EPC management strategy developed by consultant August 2017 ⁶</p>

¹ PIR 2014

² PIR 2017

³ PIR 2013

⁴ PPR January to June 2018

⁵ PIR 2012

⁶ PPR January to June 2018

1.2.3. Environmental management plan completed for contaminated sites	<p>Remediation strategies for the two major contaminated locations (The quantity of contaminated soil to be dealt with was revised down from 18000 tons⁷ to an estimated 450 tons⁸).</p> <p>Contaminated sites remediated and risk associated with contamination reduced to acceptable levels.</p>	<p>(80%)</p> <p>Two sites investigated and EMP and remediation plans prepared. Only one site requires action. EMP for Sebele site endorsed by Department of Environmental Affairs containing approved environmental strategies and targets in June 2015⁹</p> <p>Bioremediation work started in February 2017 under the supervision of an FAO International Consultant¹⁰</p>
1.3.1. Obsolete stocks safeguarded	All pesticide stockpiles (estimated at 60 to 80 tons in project document page 53) sent for environmentally sound disposal	<p>(80%)</p> <p>26.86 tons of obsolete stocks and 35 tons of contaminated seed safeguarded at Sebele warehouse¹¹</p> <p>Initial inventory over estimated quantity of obsolete stocks (42 tons)</p> <p>Thirty tons shipped out for disposal in Dec 2014. ¹²</p> <p>Remaining 15 tons including containers in storage was gutted by fire in August 2017. The remains were disposed of by the government in September/ October 2016. ¹³</p> <p>The Botswana Agricultural Marketing Board has been requesting relevant line ministries to dispose of 98x20l of Bromoxynil as well as 24D and Cypermethrin which expired in 2016. This has not been done¹⁴</p>
1.3.2. Contaminated containers collected and inspected	Strategy for long term pesticide container management developed.	<p>(80%)</p> <p>EPC management strategy and business model formulated in 2017 with the assistance of FAO Consultant. The business model for EPC management is to be piloted at Pandamatenga Commercial Farms and among smallholder farmers in Southern District – not materialized by December 2018¹⁵</p>

⁷ PIR 2014 page 7

⁸ PPR January to June 2018

⁹ PIR 2014; PIR 2017; PPR January to June 2018

¹⁰C Lang, 2018. Technical report. Bioremediation at Sebele site, Gaborone. February 2017 to December 2018

¹¹ PIR 2012

¹² PIR 2015

¹³ PIR 2017

¹⁴ Botswana Agricultural Marketing Board

¹⁵ PPR January to June 2018

		Project personnel conducting awareness campaigns on triple rinsing and the general management of EPCs. Plastic shredder and baling equipment yet to be acquired ^{16 17}
1.3.3. Obsolete stocks and contaminated containers sent for disposal/recycling	<p>All pesticide stockpiles (estimated at 60 to 80 tons in project document page 53) sent for environmentally sound disposal.</p> <p>Two thousand contaminated containers sent for disposal/recycling.</p>	<p>(80%)</p> <p>The contract for disposal of all obsolete pesticides and associated wastes awarded in November 2013.¹⁸ 26.8 tons obsolete stocks + 2 tons EPC were disposed in the UK in Dec 2014 ^{19 20}. Thirty-five tons of contaminated seed added to composting material for remediation of Sebele contaminated site.²¹</p> <p>Remaining 4.5 tons of safeguarded obsolete pesticides + 2 to 3 tons of unidentified pesticides + 10 tons of contaminated plastic containers that were awaiting shredding and exportation for disposal were burnt with the Pesticide Warehouse in August 2016. Additional stocks that had accumulated were also burnt. Government disposed of the remains from the burnt down store in September/October 2016 ²²</p> <p>Ministry of Health has obsolete DDT containers in Francistown and Pandamatenga waiting to be disposed²³ of. Quantities of these EPCs are yet to be verified (Min of Health and Wellness)</p> <p>Large amounts (actual quantity not established) of EPC are present in the country with no disposal system in place.²⁴</p>
2.1.1. Legislation for future management of pesticides/POPs waste reviewed and amended	Legislation for pesticide life-cycle reviewed and gaps in current legislation addressed.	<p>(70%)</p> <p>Legislation reviewed in 2016 and report submitted to the government. The Attorney General's Chambers advised MoA to seek permission from the cabinet to amend the Agrochemicals Act ²⁵</p> <p>The pesticides amendment bill was not presented to the July/August 2018 session of Parliament.</p> <p>MoA advised, initiating a separate bill for management of fertilizers. This has not yet been done²⁶</p>

¹⁶ SC minutes 14.11.2018

¹⁷ PPR January to June 2018

¹⁸ PIR 2014

¹⁹ PIR 2017

²⁰ SC minutes 31.08.2017

²¹ PIR 2016

²² PIR 2017

²³ Department of Public Health

²⁴ PIR 2018

²⁵ PIR 2017

²⁶ PPR January to June 2018

2.1.2. Review and assessment of local disposal options for treatment of pesticides and POPs wastes	Assessment of current options for pesticide waste management and benchmarking against international standards.	(100%) Done, bioremediation recommended for organophosphates contaminated area and concrete capping for POPs and EPC recycling ²⁷
2.1.3. Two officers from Plant Protection Services complete the FAO course on pesticide risk management hosted by the University of Cape Town in South Africa	Two government staff complete the FAO / UCT course on pesticide risk reduction.	(100%) 2 Government staff members completed the UCT course on pesticide risk management in 2012 and 2013 ²⁸
2.2.1. Pesticide life-cycle gap analysis completed	Pesticide life-cycle analysis completed.	(100%) National pesticide risk reduction consultant recruited and desk studies for pesticide life cycle analysis done ^{29 30}
2.2.2. PSMS installed and operational; all registered pesticides loaded into the system	FAO PSMS system used as the central register for pesticide regulation and tracking of new imports. Four government personnel trained in PSMS.	(60%) PSMS installed and staff trained PIR 2017 Deployment of PSMS delayed due to poor internet connectivity PIR 2017 Wi-Fi installation has improved internet connectivity. ¹² PSMS not yet operational. PSMS currently under review by FAO ³¹ Three training workshops on PSMS held for plant protection staff ³²
2.2.3. Training course developed for all pesticide and customs inspectors	Ten pesticide inspectors and plant protection staff trained (ToT).	(90%) 25 officials comprised of personnel from the Pesticides Registration Authority, National Agrochemicals Committee, Botswana University of Agriculture and Natural Resources (BUAN), extension staff from the Plant Protection Division, staff from the Ministries of Health and Environment, Wildlife and Tourism were trained on FAO Pesticides Registration Toolkit. Pesticides Registration Authority was expected to initiate use of Toolkit in the first half of 2018 but has requested for the training of the rest of the National Agrochemicals Committee ³³
2.3.1. Current pest management strategies assessed and reviewed		(60%) Review of previous studies undertaken and identification of priority crops done ³⁴

²⁷ PIR 2017

²⁸ PIR 2017

²⁹ M Rother, 2016. Draft risk reduction measures

³⁰ PIR 2017

³¹ PPR January to June 2018

³² PIR 2014

³³ PIR 2017; PPR January to June 2018

³⁴ PIR 2014

	Opportunities for integrated pest management (IPM) in subsistence and commercial production assessed.	IPM techniques shared with stakeholders. IPM strategy not yet developed ³⁵ Consultations to acquire services of national and international consultants on development of an IPM policy ongoing ¹²
2.3.2. Revision of existing policy to reduce the use of highly toxic materials	50% of Class 1 (WHO) pesticides deregistered for use in Botswana.	(%) The Combined HHP and KAP survey was completed in February 2017, data entry completed; analyses completed. Recommendations for HHP risk reduction strategy produced ³⁶ and HHP consultation workshop held. ³⁷ HHP identification using JMPM criteria completely. Shortlist of HHPs in Botswana available. Preliminary results presented in Geneva at the Basel, Rotterdam and Stockholm Convention COP 8 May 2017. ³⁸ A booklet that will capture the results of the survey is pending ³⁹
2.4.1. Comprehensive communications and awareness strategy developed		(70%) A comprehensive communication and awareness strategy for life cycle management of pesticides has been developed ⁴⁰
2.4.2. Communications and awareness materials developed	Five communications messages developed with a focus on the safe use of pesticides.	(80%) Communications and awareness materials developed ⁴¹
2.4.3. Communications and awareness materials delivered	Communications and awareness materials delivered to 10 target groups. Behavioral change in target groups assessed (reduced use of HHPs)	(70%) Some awareness materials were used in the March 2018 awareness campaign ⁴² Awareness campaign on-going ⁴³ Report on HHP findings and HHP risks reduction measures adopted by the workshop ⁴⁴

³⁵ PPR January to June 2018

³⁶ Annex M Rother Draft Risk Reduction Measures 2016 9 23.doc

³⁷ Botswana_CLEAN_NATIONAL HHP workshop report_edIS 28112017_LLD(4)_ (1) (1)(1) (4).doc

³⁸ PIR 2014; PPR January to June 2018; C Lang, 2018. Technical report. Bioremediation at Sebele site, Gaborone. February 2017 to December 2018

³⁹ PPR January to June 2018

⁴⁰ Botswana_communication_Matrix_03082018LLD

⁴¹ Botswana Agricultural Marketing Board

⁴² PPR January to June 2018 page 14

⁴³ C Lang, 2018. Technical report. Bioremediation at Sebele site, Gaborone. February 2017 to December 2018

⁴⁴ PPR January to June 2018

3.1.1. Trial of selected treatment option(s) (bench-top, laboratory)	Assessment of 5 treatment options. Cost and technical feasibility study finalized. The most appropriate option for each site confirmed.	(100%) The EMP for Sebele includes the treatment options for the contaminated site and was endorsed in June 2015 by DEA ⁴⁵ Bioremediation recommended for Sebele site
3.1.2. Pilot-scale trials of treatment options	Two highest risk sites excavated and soil decontaminated	(80%) Complete. Only one site warranted remediation. Excavation and bioremediation started at Sebele ^{46 47}
3.1.3. Updating of EMP for site remediation based on pilot studies		(100%) Complete One area in the warehouse has Chlordane – POPs, require activated charcoal to remediate it.
3.2.1. Issue of tender and selection of remediation contractor		(100%) Complete Private contractor appointed
3.2.2. Implementation of the remediation strategy	Two highest risk sites excavated and soil decontaminated. Approx. Four hundred fifty tons of materials treated.	(80%) Bioremediation of contaminated soil commenced in February 2017 at Sebele ⁴⁸ . The initial estimate of contaminated soil was significantly higher than established in the updated inventory and subsequent environmental assessments. ⁴⁹ The initial estimate of 18 000 tons ⁵⁰ was an overestimate. The January to June PPR (page 15) indicated that 450 tons of soil were to be decontaminated. One hundred eighty cubic meters ⁵¹ of contaminated soil was excavated and mixed with ingredients for bioremediation.
3.2.3. Assessment of implementation	Soil and groundwater validation analysis showing measured levels beneath target levels.	(0%) Will be done upon completion of Bioremediation.
4.1.1. M&E/project tracking plan developed	Integrated work and M&E plan developed.	(100%) Annual work plan for 2013 developed ⁵²

⁴⁵ PIR 2014

⁴⁶ C Lang ,2018. Technical report. Bioremediation at Sebele site, Gaborone. February 2017 to December 2018

⁴⁷ BTOR 7-13.10.2018 C lang

⁴⁸ PIR 2014; PPR January to June 2018; C Lang ,2018. Technical report. Bioremediation at Sebele site, Gaborone. February 2017 to December 2018

⁴⁹ Bot_Tracking tool

⁵⁰ PIR 2014 page 7

⁵¹ Bioremediation Technical report February 2017 to December 2018

⁵² PIR 2014

		The work plan is established ⁵³
4.1.2. M&E/project tracking plan installed	Integrated work and M&E plan installed.	(80%) The work plan is being regularly updated ⁵⁴ . Tracking tool not being regularly updated ⁵⁵ . It was however updated in November 2016 ⁵⁶
4.1.3. M&E system operational	Integrated work and M&E plan operational.	Work plan established and updated regularly ⁵⁷ Work plan and M&E plan operational ⁵⁸
4.2.1. M&E plan implemented and M&E reports produced	Set of impact monitoring criteria developed and used to assess the quality of implementation. Monthly reporting on progress.	(80%) Not yet done. The community-relevant component 2 not yet complete ⁵⁹ . MTR comments from government submitted to MTR consultants; MTR recommendations adopted ⁶⁰ Monthly, biennial, and annual reports produced. ⁶¹
4.2.2. Health surveillance data for all operational staff collected to ensure no impact to health during field implementation		(60%) Medical tests are done when staff undertakes activities that involve exposure to pesticides. ⁶²
5.1.1. Institutional arrangements confirmed	Inter-ministerial management of the project (Agriculture, Environment, and Health).	(100%) Institutional arrangements confirmed, but NPC is not released to work on the project full time. 3 rd NPC appointed in December 2013 The steering committee meeting planned for the beginning of 2014 had to be canceled due to lack availability of senior members. To be rescheduled in July/August 2014 ⁶³

⁵³ PIR 2017

⁵⁴ PIR 2017

⁵⁵ PIR 2017

⁵⁶ PPR January to June 2018

⁵⁷ PIR 2017

⁵⁸ Workplanswx

⁵⁹ PIR 2017

⁶⁰ PPR January to June 2018 page 16

⁶¹ PIR 2017

⁶² PIR 2014

⁶³ PIR 2014

		Inter-ministerial Project Management Team, Project Steering Committee, FAO Consultants and NPC in place ⁶⁴
5.1.2. Project Steering Committee (PSC) and PMU operational	Regular assessment of progress by Steering Committee.	(50%) PSC does not meet regularly PSC and PMU established. NPC not released from government responsibilities and unable to adequately support project implementation. 3 rd NPC appointed since project implementation ⁶⁵ A No-Cost Project extension to October 2018 requested to allow for the completion of all activities and achievement of results ⁶⁶ . Inception SC meeting held on 16.04.2012 ⁶⁷ . PSC did not meet regularly ⁶⁸
5.2.1. Work plan developed	Fully integrated annual work plan to include a log frame and critical path analysis (timeline) developed and maintained. Procurement plan developed highlighting major contracts and purchases and the timeline for their supply.	(80%) A work plan developed at inception ⁶⁹ and reviewed every year ¹⁹ Procurement plans for cash co-finance endorsed by SC but suffered a delay in implementation ⁷⁰
5.2.2. Work plan approved	Fully integrated annual work plan to include a log frame and critical path analysis (timeline) developed and maintained.	Work plan approved at inception ⁷¹ and Steering Committee meetings ⁷²
5.2.3. Budget revisions approved		Work plan revised in January 2018 and granted a No Cost Extension up to 31 st October 2018 ⁷³

⁶⁴ PIR 2017

⁶⁵ PIR 2014

⁶⁶ PIR 2017

⁶⁷ Aide Memoire GCP-BOT-011-GFF 20120424

⁶⁸ PIR 2017

⁶⁹ PIR 2014

⁷⁰ PPR January to June 2018

⁷¹ PIR 2014

⁷² PIR 2017

⁷³ PIR 2017