Environmental & Social Impact Assessment on Obsolete DDT disposal

Promoter: Environment, Forest & Climate Change Commission

DDT store Location: Oromia Regional State, East Shoa Zone, Adama & Adami Tulu woredas

Consultant: Gillo Development, Research, and Environmental Protection Consultants PLC
Telephone: 0912507914/0113690177
E-mail: gilloconsult@gmail.com/gillo_consut@yahoo.com
Addis Ababa, Nifas silk lafto sub city, woreda3, House, No: 511/14

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Acronyms

$	Dollar
%	Percent
°c	Degree Celsius
µg/Nm^3	Microgram per Normal cubic meter
ADR	Agreement International Carriage of Dangerous Goods by Road
AFI	Acute febrile illness
AI	African Institute
African ChemObs	Integrated Health and Environment Observatories and legal and institutional strengthening for the Sound Management of chemicals in
AIDS	Acquired Immunodeficiency Syndrome
am	ante meridiem
APPF	Air Pollution Prevention Forum
ARI	Agriculture Research Institute
ASP	Africa Stockpiles Program
ASP-P1	Africa Stockpiles Program- Project one
ATPPF	Adami tulu pesticide production factory
C6H5Cl	chlorobenzene
CBD	Convention on Biological Diversity
CBO	Community Based Organization
CESA	Country Environmental and Social Assessment
CRV	Central Rift Valley
CSOs	Civil Society Organizations
DALDO	District Agriculture and Livestock Development Officer
DBA	Decibels
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloriethylene
DDT	Dichloro Diphenyl Trichloroethane
DMD	Disaster Management Department
DNA	Designated National Authority
DNOC	Dinitro-o-Cresol
DoE	Department of Environment
DRE	Destruction and Removal Efficiency
E.C	Ethiopian Calendar
e.g	Example
EFCCC	Environment, Forest and Climate Change Commission

EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMA	Environment Management Act
EMP	Environmental Management Plan
EMTK	Environmental management toolkit
EPA	Environmental Protection Authority
EPE	Environmental policy in Ethiopia
ESIA	Environmental and Social Impact Assessment
FAO	Food and Agriculture Organization
FDRE	Federal Democratic Republic of Ethiopia
Fe	Factor of environmental
FM	Field Manager
FP	Factor of pesticide
G.C	Gregorian Calendar
GCAs	Game Controlled Areas
GCLA	Government Chemist Laboratory Agency
GDREPC	Gillo Development Research and Environmental Protection Consultants
GEF	Global Environment Facility
GTZ	German Agency for Technical Cooperation
H&S	Health and Safety
HBCDD	Hexabromocyclododecane
HCBD	Hexachlorobutadiene
HIV	Human Immunodeficiency Virus
hr	Houre
I &Aps	Interested and affected parts
IBCs	intermediate bulk containers
IEC	Information Education and Communication
IFC	International Finance Corporation
IMDG	International Maritime Dangerous Goods
IMO	International Maritime Organization
IPCC	Intergovernmental Panel on Climate Change
IPM	Integrated Pest Management
IRU	Indefeasible Right of Use
KA	Kebele Administration
Kg	Kilo gram
Km	Kilo Meter

km^2	Square kilometer
LD50	Lethal Dose 50% of the animals
LDLO	Leathal Dose Low
M	Meter
m.a.s.l	meters above mean sea level
m^2	Meter Square
mg	Mile gram
mm	Mile meter
MOH	Ministry of Health
MSDS	Material Safety Data Sheet
NEMC	National Environment Management Council
ng.g	Nanogram/gram
NGO	Non- governmental organization
NIT	National institute of transport
No	Number
NO_2	Nitrous oxide
NS	North South
OEFCCA	Oromia Environment, forest & climate change Authority
OHO	Oromia Health Office
OP	Obsolete pesticides
OPS	Obsolete pesticides stock
PAN	Pesticide Action Network
PCBs	Polychlorinated biphenyls
PCNs	Polychlorinated naphthalenes
PCP	Pentachlorophenol
PE	Polyethylene
PeCB	Pentachlorobenzene
PFOS	Perfluorooctane sulfonic acid
PFOS-F	perfluorooctane sulfonyl fluoride
Pg/ m^{-3}	Pictogram per Cubic Meter
PIC	Prior Informed Consent
PLC	Private limited company
pm	Post Meridiem
PM	Particulate Matter
PMU	Project Management Unit
POP	Persistent organic pollutant
PPE	Personal Protective Equipment

ppm	parts per million
PRA	Participatory Rural Appraisal
RCD	Residual-current device
S6DDTs	sum of DDTs
SC	Share company
SO_2	Sulfur dioxide
SOP	Standard Operational Procedure
TBRA	Task-Based Risk Assessment
TVET	Technical and vocational training center
U.S	United State
UK	United Kingdom
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
WB	World Bank
WDP	Well Done Partner
WMO	World Meteorological Organization

Executive summary

This Environmental Impact Assessment (ESIA) study for absolute pesticides disposal has been conducted according to the legal framework of EIA proclamation of the government of Federal Democratic Republic of Ethiopia, proclamation No. 299/2002 determining the modalities of protection, conservation and promotion of environment in Ethiopia stipulates that every development project shall be required to undergo an Environmental Impact Assessment prior to its commencement.

It is in this regards that, CEFCC commissioned the consultancy firm (Gillo Development, Research and environmental Protection consultants - PLC) to carry out the Environmental and social impact assessment of the project under the study. Accordingly, the consulting firm has conducted the study in line with the aforementioned legal framework of EIA proclamation. With this respect, policy, legislative and institutional issues that are most relevant to the chemicals in general and obsolete DDT disposal projects in particular have been reviewed. The nature of project, in view of the severity of project-associated impacts places it in category I, thus requires a full Environmental Impact Assessment (EIA).

In Adami -Tulu 446 tone of DDT was stored, while in Adama town, 02 KA in specific place called Migra, the store leased from individual for the last 3 years by Oromiya heath bureau, which was initially produced for the purpose of mosquito vector spray for malaria control by Adami Tulu Pesticides Processing Factory (AAPPPF).

The project objective is the cleaning up and disposal of obsolete stocks and the development of "sound pest and pesticide management strategies", with the aim of ensuring safe and environmentally sound elimination of obsolete pesticide stocks, and associated wastes such as, contaminated containers / equipment and related materials stored along with contaminated OPS stored in the aforementioned stores .Hence, the objective of this ESIA, is to to identify sensitive environmental components likely to arise during inventory, repacking, transporting and final disposal of the obsolete DDT in order to reduce their likely impacts and risks that are supposed to be posed by the stockpile of obsolete DDT stores.

The methodology used followed the and meets the requirements of EPA's Environmental Impact Assessment guideline and FAO EMTK obsolete pesticide disposal guideline .Review of administrative, legal and policy requirements relevant to the obsolete DDT disposal, and assessment of baseline conditions of the project study area. The source of data was both from

primary and secondary sources. Identification of the project activities that causes an impact, prediction and evaluation of impacts and analysis of significant environmental issues on the basis of those data, choosing mitigation and enhancement measures and developing environmental protection, monitoring and management plans are the methodological approaches followed in conducting this ESIA study.

In order to materialize the aforementioned objective the Africa Institute has signed an agreement with the Government of Ethiopia represented by the Commission of Environment, Forest and Climate Change (CEFCC) and Ministry of Finance and Economic Cooperation to dispose the DDT stored in Adama town and Adami Tulu Pesticides Processing Share Company, Ethiopia .in line with 1992 Basel Conventionon and the 2004 Stockholm Convention prohibit and control POPs and took the initiative to stop manufacturing the chemical eight years ago but still holds unused reserves in Adami tulu and Adama town to be banned. The project is responsible for the safeguarding (repackaging, management of stores, and transport from stores to Djibouti) and disposal of approximately 1400 tons of the organo chlorine pesticide, DDT (450 tonne at Adami Tulu, 500 at Adama).

An initial environmental examination and environmental scoping exercise has been carried out with the main objectives of defining the limits of the study area, list of valued ecosystem components within the study area, list of activities, type and magnitude of the proposed project and define list of Impacts to be studied. Baseline Environmental Condition of the Project area has both bio-physical and socio-cultural aspects. According to the assessment, the major activities that have adverse impacts are inventory, repacking, transporting and disposal, the details are discussed underneath.

The relevant government agencies and Project impacted and affected community in the vicinity of the pesticide storage sites Adam town Migira Kebele and Adami tulu Durbi Widna borano KA *were consulted to solicit their concerns . Following, the explanation made by the study team, the participants raised numerous questions on the general mode of operations, hazards and associated risks, and the measures envisaged by the project in the case of exposure or poisoning. The study team explained the preventive and mitigation measures to be executed during the safe guarding activities. As noticed during the discussion most of community members consulted doesn't have awareness and even information about the obsolete pesticide storage. Finally, upon rigorous discussions, the community appreciated the government decision to dispose and requested for timely and practical action.*

*The ESIA discusses major environmental and social issues and constraints that can arise from the project implementation. The major positive impacts of the project identified are mainly those of economic benefits at the national, regional and local level. The proposed project has been found to have both beneficial and adverse environmental during inventory, repacking and transporting. Employment opportunity and income generation for the local community can be benefited from temporally creation of job and income and the disposal process will create a healthy environment, free of Ops pollution and enable the local community to live in clean environment free of pollution, while the major adverse impacts identified during the assessment are**:***

***Heath Impacts**: heath impacts on workers working in the store and out the store during safeguarding, causing poisoning such as "acute and persistent injury to the nervous system, lung damage, injury to the reproductive organs, dysfunction of the immune and endocrine systems, birth defects, and cancer".*

***Air, soil & water pollution due to release of harmful vapors**: there could be a release of harmful dust and vapors during verification & repacking through doors and windows of the store which can have an impact on the surrounding environment. Due to it's persistent in the environment and very insoluble in water, making it a highly polluting hazard, as well as it has also devastating effect on the aquatic environment, being able to affect all kinds of wildlife, and given its low decay rate, it proliferates through the entire web of life until it reaches the species inhabiting.*

***Impacts Caused Due to the Store Condition**: poor store condition and its noncompliance could usually and eventually lead to accidents such as fire and / or explosion under the influence of heat, whose impact can be catastrophic (risk of poisoning by product contact or inhalation during diffusion of toxic fumes, air and water pollution, human poisoning and damage to plants and animals.*

***Impact during Transportation by Road**: There are a number of impacted anticipated during shuttling by road such as: traffic congestion, Contaminated particles on the outside of new packages and on the wheels of trucks and forklift during loading and transport operations,, accidental leaks of products can cause poisoning of personnel, contamination of vehicles and localized soil pollution in the site, soil and water pollution in the transport route ,Fire or explosion because of accidental contact of leaking oil products with a heat source, confusion*

about the nature of the pesticide following a deterioration of package labels, Heavy falling objects, containers especially on the feet; Skin burns caused by exposure to DDT without protective equipment; electrical hazards in the event of failure of the truck loaded with pesticides; Increased risk of road accidents in driving conditions often encountered (long distances, heavily loaded vehicles, bad roads as is the case between the main road &, weather conditions);

Impact during transportation by Sea: marine pollution due to sinking of containers or ships during transportation by sea is potential environmental impacts likely to occur during transportation of disposal of the obsolete DDT.

Impacts during Disposal: Air, water and soil pollution are Potential environmental Impacts likely to occur during disposal of the obsolete DDT (Dioxins (PCDD) and furans (PCDF) are environmental contaminants detectable in trace amounts in air, water and soil). Generation of hazardous special waste (sawdust, sand or dry soil containing the chemical absorbed) as a result of leakage of product.

Analysis of project alternative: *the analysis of project alternative analysis was made against action Vs no action, alternative to repacking (consolidation Vs direct collection), safeguarding by national manpower capacity Vs international contractor, transportation alternatives railway Vs road, transport route alternatives from stores to Djibouti, alternatives from shipping port to disposal facility outside the country and disposal technologies alternatives and disposal options within the country have been summarized as follows:-*

The with action alternatives of disposing DDT through proper safeguarding during repacking, transport, and disposal of DDT from stores they are located, is preferable options, although it to avoid environmental impairment and impact on public health would worsen as the containers degraded and leaked, causing wide spread soil and ground water contamination, regardless of its financial, technical, logistics capacity requirements.

*Regarding collection options, direct collecting and shipping from the existing two stores site***,** *to avoid the risks of environmental and health impacts likely to occur in extended storage at the new site. the combination of internal and external capacities to conveniently carry out the safeguarding operation, road transportation as the best option, taking into account, the presence of experienced local truck drivers* who can easily *be trained to drive vehicles that carry obsolete pesticides to handle emergencies. Among the 3 route options, the team*

recommended route 2 (Stores location - Awash Sebat Kilo - Awash Areba – Logia Dichoto – Djibouti) being less risk according to FAO tool kit assessment. Regarding the shipping line ocean fright has been chosen as it has been successfully used by Ethiopia before and relatively cheap.

As disposal technologies alternatives high-temperature incineration of large-scale fixed incinerator was recommended as final and disposal choice outside the country which has been found to be environmentally sound and successful disposal technologies of ops by ASP outside the country.

With regard to the organizational arrangement and their responsibilities: the management and implementation and supervision of safeguarding operations are to be carried out by and under the direction of AI & CEFCC. With regard to the human resources (expertise) requirement, there is a potential to use those personnel who carried out the first and second phase" Obsolete Pesticides Prevention and Disposal Projects and by "Africa Stockpiles Project" can be utilized as a resource personnel through provision additional refreshment training.

Cost effective preventive and mitigation measures of identified impacts on occupational health air, soil and water have been proposed to minimize/reduce where possible to be eliminated. The following are some of the preventive and mitigation measures are proposed by the study team

Protecting the neighboring community from DDT dust during project operations : In order to prevent dusts, from reaching these potential receptors, the use of external enclosure with dust control filtering and zoning during safeguarding is proposed.

Prevention and Mitigation Measures during Verification: *review of the existing inventory and, the actual condition of the interior of the store before entering, assessing the hazards and the nature of the repackaging activity, determines the type of Personal Protective Equipment required, specification of repackaging equipment which minimizes the necessity for contact with pesticides, to zone off with hazard type or fencing and warning signs and covering doors and windows to prevent the egress of dust and vapor.*

Mitigation measures: *Identification and notification of the nearest hospital or clinic about the ongoing operation and agree on the collaboration required, medical checks up, including blood tests medical checks up, including blood tests for the project staff, zoning the repacking*

and loading area and setting emergency shower.

Prevention and mitigation measures during repacking & compacting of empty packaging material: Putting well-designed operating procedures in place, Training of all operatives in safeguarding techniques and operating procedures, use of experienced operatives supervising activities, temporary removal of all non-operational personnel and animals from working areas, Classification of the chemical hazard of the wastes by the international contactor, use of PPE to prevent direct exposure as directed by the TBRA, Collection of all contaminated PPE, HSE plan (as per EMTK4) to be detailed, The specification and use of repackaging equipment should comply with IMDG and ADR, New packaging materials need to kept clean during repackaging there is a need to zone the site into high, intermediate and low risk zones and safeguarding according its risk level, doors and windows of the store have to be covered to prevent the egress of dust and vapor, all electrical and other equipment used inside the store should be flame proofed; incompatible materials shall not be mixed together, The floors need to be cleaned washing (all washings to be collected), after evacuating the DDT, the Adama store shouldn't use for any food and related food staff, if so it needs to be modified and gets an approval by the respective authority before in use, the doorways and windows should be covered with plastic sheeting.

Mitigation measures: Notification of police / hospitals / fire service / local authority, carried fire extinguishing equipment, insulating additional roofs above the existing roofs to prevent high temperature during summer, as deemed necessary , emergency shower should set up at the site, cover environmental employers liability insurance, 3 stage changing station to be employed, the approach to occupational health and safety management should be presented in the submissions of disposal of obsolete DDT companies during the tendering stage.
Proposed prevention mitigation measures for impacts generating during transportation by road. Prevention measures: driver of forklift used in loading to be trained, wheels of transport vehicles need to be kept clean, the maximum speed of the vehicles is to be set to 40 km/hr, ensuring electrical wiring being intrinsically safe during operation, each containers should be stowed with compatible materials as per ADR / IMDG, the storage of Polyethylene bags within the container is such that the materials should not leak.

Mitigation measures: *The stowage and loading of DDT with care on the transport vehicle and giving the driver a delivery sheet/ packing list with relevant material safety data sheet, Personal Protective Equipment & fire extinguisher and the hazard signs has to be in place,*

prior to travel orientation on the necessary safety precautions to be taken, drivers need to be trained on precautions and actions to be taken in case of emergency. Only certified road worthy vehicles, all vehicles to have insurance & all drivers to have proof of licensing

Proposed prevention & mitigation measures for impacts likely to generate during transportation by sea: Prevention measures: the storage of PE Bags within the container needs to be protected from leak

Mitigation measures: marine salvage would be required to rescue the containers.

Proposed Prevention & mitigation measures for impacts generating during disposal: Prevention measures: The incineration facilities should be equipped with state of the art pollution abatement technology, emissions to be analyzed to conform that they meet specification & the facilities have to fail-safe emergency shutdown procedures to stop waste burning if a serious failure in the process occurs.

Mitigation measures: the facilities should develop action and evacuation plans to conform to the EMTK guidelines.

***Environmental management and monitoring plan**: The Environmental management and monitoring plan proposed in this document is concerned with the implementation of the measures necessary to minimize or offset adverse impacts and enhance beneficial impacts. for shaping the project to enhance the overall environmental performance cannot be achieved.*

To address the management and monitoring of the identified adverse environmental impacts associated with the project the proponent should assume the overall responsibility to comply with the proposed environmental management and monitoring plan (EMMP) and ensures that all activities executed with sub-contractors also comply with positive environmental sensitivities as well as collaborate with the concerned regulatory agencies. In order to materialize the proposed management, monitoring plan environmental & social management training plan, a total budget of birr 2.3 million has been proposed to be committed by the project implementer.

In conclusion : According to the findings of the environmental assessment, it is reasonable to conclude that the environmental impacts of establishment of the project will be minor, of low magnitude, low intensity and low sensitivity; they would be duly mitigated by incorporating the suggested measures. Implementing the environmental management plan (EMP), which forms an integral part of the ESIA process, will ensure the environmental compliance of the DDT

disposal project. Apparently, the consultation made with wide range of community members of project impacted area, revealed that, they are in support of the envisaged project activities. Thus, it can be concluded that the project benefits by-far outweighs its adverse socio-economic and socio-ecological impacts as these two can be mitigated by proper utilizations of the suggested mitigation measures, management and monitoring plan.

Based on the conclusions of the ESIA study, and on the assessment made with professional judgment, it is safe to recommend the approval of the findings, since the clearing of the project meets the provisions of sustainability principles in providing the benefits of economic gains while sustainably modifying the social and physical environment.

Therefore, the consulting group hopes that the project can successfully contribute possible means to manage any impacts likely to occur from the project activities on environment and corresponding health safety situations of employees at the project site as per the EIA, guidelines and specific recommendation given. The following are some of the major recommendations made by the study team:

- *The project implementation team needs to use the best available technology (BEST) of repacking , transporting and disposal as well as personnel protective equipment's*
- *There is a need to implement the proposed by budget for environmental management, monitoring and training budget*
- *Provision of proper personal safety device to employees with verification, repacking, transporting and disposal for' health protection.*
- *Submission of regularly report to the regulatory authority and notification about the occurrences of unforeseen events, outstanding issues that might arise during the project implementation, and appropriate measures taken accordingly.*
- *There is a need to make all the necessary arrangement with regulatory authority for joint monitoring & social performance of the project.*
- *In order to avoid, the residual effects of obsolete DDT, there is a need to avoid the Adama store for the use of food and food related staff, unless modified and approved by the respective regulatory authority.*