



# Pesticide Lifecycle in Ethiopia: challenges, opportunities and leverage points

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RAISE-FS working paper #007



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#### Summary of document

The agricultural sector in Ethiopia is facing a major challenge due to low crop productivity and production caused by pests. To overcome this issue, the use of pesticides is essential. However, the misuse of pesticides is a common practice in the country. To tackle this problem, RAISE-FS project organized a workshop that brought together stakeholders from various sectors. The workshop identified key challenges, opportunities, and leverage points in the pesticide life cycle and discussed ways to address them. The stakeholders discussed registration, formulation, import, marketing, transporting, storage, use, waste disposal, human health, and environmental concerns related to pesticides. By implementing the recommendations from this workshop, Ethiopia can enhance its agricultural productivity sustainably.

Keywords: Pesticide, use, life cycle, waste disposal, Ethiopia

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# Contents

<b>Preface</b>	<b>viii</b>
<b>List of abbreviations and acronyms</b>	<b>ix</b>
<b>Summary</b>	<b>x</b>
<b>1 Introduction</b>	<b>1</b>
<b>2 Gaps and Opportunities</b>	<b>3</b>
2.1 Provisions on pesticide registration and management and its limitations	3
2.2 Overview of pesticide use in Ethiopia	4
2.3 Challenges and opportunities in the pesticide life cycle	5
2.3.1 Registration	5
2.3.2 Import and formulation	5
2.3.3 Marketing	6
2.3.4 Transport and storage	6
2.3.5 Pesticide use	7
2.3.6 Waste disposal	7
<b>3 Leverage points and Opportunities</b>	<b>9</b>
3.1 Leverage points	9
3.2 Opportunities	9
<b>4 Way forward</b>	<b>10</b>
<b>References</b>	<b>12</b>
<b>Annex I: List of participants</b>	<b>14</b>
<b>Annex II: Challenges, leverage points, provisions and gaps in the regulations</b>	<b>15</b>



# Preface

Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems (RAISE-FS) is a four-year program funded by the Dutch Embassy in Addis Ababa and hosted by Stichting Wageningen Research Ethiopia based in Addis Ababa, to bring about transformation in the Ethiopian food system. RAISE-FS will develop and implement a demand-driven and interdisciplinary approach to Research for Food System Transformation (R4FST) and as such contribute to the Government of Ethiopia's transformational agenda.

RAISE-FS adopts the food system approach as a Theory of Change (ToC), which helps in analysing the drivers and food system activities that contribute to the transformation of the food system by addressing leverage points, resulting in increased productivity, enhanced value chain performance, and improved human nutrition for food security while minimizing environmental impact and ensuring social inclusion.

The project aims to leverage transformation in Ethiopian food systems, covering the spectrum from food-insecure households and regions, to better-off households that are food-secure and can realize production surpluses, towards commodity commercialization efforts that contribute to rural and urban consumption demands and export.

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# List of abbreviations and acronyms

a.i.	Active ingredient
ATI	Agricultural Transformation Institute
CoC	Certificate of Competency
EAA	Ethiopia Agriculture Authority
EAC	East-Africa Community
EABC	Ethiopia agricultural business cooperation
EPOSPEA	Ethiopia Pulses, Oilseeds and Spices Processing and Exporting Association
FAO	Food and Agriculture Organization of the United Nations
HHP	Highly hazardous pesticides
IPM	Integrated Pest Management
MoA	Ministry of Agriculture
MoH	Ministry of Health
NGOs	None Governmental Organizations
PPE	Personal protective equipment
RAISE-FS	Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems
RED&FS	Rural Economic Development and Food Security
RRB	Regional Regulatory Bodies
SWR	Stichting Wageningen Research
WCDI	Wageningen Centre for Development Innovation, Wageningen University & Research
WHO	World Health Organization
WTO	World Trade Organization
WUR	Wageningen University & Research

## Summary

Crop production and productivity in Ethiopia is still very low. One of the major reasons for this low productivity and production is damage to crops by both regular and migratory pests. Pesticide is a critical input for enhancing agricultural productivity in Ethiopia's food system. However, use and misuse of pesticides is a common phenomenon in agricultural practices of Ethiopia. To get in-depth insights on the pesticide life cycle in Ethiopia the Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems (RAISE-FS) project organized a consultative workshop by bringing together stakeholders engaged in pesticides research, regulation, production, distribution, marketing, teaching/university and NGOs. The workshop aimed at identifying challenges, opportunities, leverage points and engaging relevant stakeholders in addressing the identified challenges with shared responsibilities and course of actions. Papers were presented by representatives of different organizations and discussions were held on registration, formulation and import, marketing, transporting and storage, use, waste disposal, human health and environment. To augment the assessments presented during the workshop desk review was conducted. Under each pillar of pesticide life cycle key challenges, opportunities and leverage points were identified.

# 1 Introduction

Use and misuse of pesticides<sup>1</sup> is a common phenomenon in agricultural practices of Ethiopia. This varies from using the wrong products and dosage; highly hazardous pesticides; counterfeit products and inappropriate disposal of waste. Sustainable production requires the availability of low-risk and bio-pesticides as well as the implementation of integrated pest management. Currently, in Ethiopia regulation i.e., registration and post-registration control that includes inspecting pesticides during importation, storage, transportation, distribution, use and disposal is undertaken by the newly established Ethiopian Agriculture Authority (EAA) (formerly part of MoA) (Negarite Gazette, 2022). The authority is also responsible for certification, monitoring and enforcement of rules and regulations according to the stipulated provisions in power, and duties of the Ethiopian agricultural Authority Regulation No. 509/2022 and the proclamation number 674/2010 (Negarite Gazette, 2010). Despite presence of legislations, provisions, rules and regulations for registration, certification, marketing and use of pesticide, its life cycle management is constrained by numerous challenges.

The agricultural input and output marketing system development technical committee (part of the RED&FS sector working group) has identified the following challenges with regards to pesticides lifecycle:

- There is a serious challenge in the use of agrochemical in the country – poor quality chemicals, adulteration, misuse by end users
- The regulatory capacity is reported to be weak and unclear policy in taking measures
- Existence of huge burden of expired agro-chemicals
- Thus, it is important to do a comprehensive assessment of the importation, local production, marketing and use of agro-chemicals in the country

The pesticide life cycle<sup>2</sup> applies to all the stages a pesticide might pass through from production to its degradation in the environment after use, or its destruction as an unused product. It is a useful model to assess all challenges and opportunities with regard to pesticides. The life cycle includes manufacture, formulation, packaging, distribution, storage, transport, use and final disposal of a pesticide product and/or its container (Figure 1). Smooth flow of the life cycle requires well organized institutional arrangements, and coordination and collaboration of institutions responsible for managing the different stages of the life cycle. To obtain in-depth insights on the pesticide life cycle in Ethiopia the Resilient Agriculture for Inclusive and Sustainable Ethiopian Food Systems (RAISE-FS) project organized a consultative workshop by bringing together stakeholders engaged in pesticides research, regulation, production, distribution, marketing, teaching/university and NGOs. The workshop aimed at identifying challenges, opportunities, leverage points and engaging



Figure 1 The pesticide life cycle – adapted from van den Bergh et al., 2020

<sup>1</sup> Pesticide is used in the generic sense as per the definition in the International Code of Conduct on Pesticide Management FAO/WHO 2014 – “any substance, or mixture of substances of chemical or bio- logical ingredients intended for repelling, destroying or controlling any pest, or regulating plant growth”

<sup>2</sup> The International Code of Conduct on Pesticide Management FAO/WHO 2014

relevant stakeholders in addressing the identified challenges with shared responsibilities and course of actions.

Papers were presented by representatives from Wageningen University & research, EAA, MoA, Food and Agricultural Organization (FAO), Adami Tulu pesticide formulating Share Company and Hawassa University. Invited speakers from the public and private sector, and the development partners shared their organizational mandates, experiences and involvements in any one of the pesticide life cycle stages; challenges faced and opportunities for future improvements were also highlighted. Discussions were held on registration, formulation and import, marketing, transporting and storage, use, waste disposal, human health and environment. Under each pillar key challenges, opportunities and mandated institution/s were identified.

Consensus was reached to establish a core group that will harmonize the identified challenges with priorities solutions for each pillar. The core team comprises representatives from MoA, EAA, FAO, EIAR and Stichting Wageningen Research Ethiopia (SWRE). The SWRE team took responsibility to summarize the findings. Once the document is finalized the core group will harmonize the identified challenges with priorities, action points, technical and financial capacities of partner organizations. The core team will also meet with the group at the Agricultural Transformation Institute (ATI) and work together on the ongoing pesticide initiative.

## 2 Gaps and Opportunities

### 2.1 Provisions on pesticide registration and management and its limitations

Alike other African countries, pesticide use in Ethiopia is challenged with a number of obstacles since its started to be used in the 1950's. Since then, pesticide use has increased significantly both in volume and types that target diverse pests on a single or on various crop and animal species. Pesticides differ in type (insecticides, herbicides, fungicides, bactericides, and rodenticides) and mode of action affecting the anatomy, physiology, or biochemistry of the target pests. To take advantage of the technology, knowledge on pesticides, pests and their interaction is very important. Besides its knowledge requirement, controlling the lifecycle from introduction or formulation to waste disposal is essential to minimize its negative effect on human and the environment. This requires knowledge, legislations and strong law enforcing institution/s. To this end, Ethiopia has passed three legislations/regulations (Special Decree No. 20/1990; Proclamation No. 176/1999; and Proclamation No. 674/2010) on pesticide registration and management. The first one is a special decree, while the latter two are full pledged proclamations. Lately, after the establishment of EAA, as all agricultural inputs including pesticide regulation related duties and responsibilities are legally transferred to EAA, currently the sole implementer of Proclamation No. 674/2010 is EAA (Negarite Gazetta, 2022).

The Pesticide Registration and Control Special Decree No. 20/1990 was issued on September 1, 1990. It was replaced by a Pesticide Registration and Control Proclamation No. 674 /2010. According to the revised Decree, no pesticide shall be registered unless the efficacy, safety, and quality is tested under field or laboratory conditions and approved by the Ministry of Agriculture (MoA). Moreover, no person may formulate, manufacture, import, pack, re-pack, label, distribute, sell, store or use a pesticide that is not registered by the MoA or contrary to the conditions of its registration. All indicate the requirements for pesticide registration, certification, manufacturing, formulating, packaging and labelling, transporting, marketing, safe use, monitoring and control, and disposal of waste and empty containers. However, the implementation of the decree is constrained by lack of technical and material capacity of law enforcing institutions.

The 2010 proclamation (Articles 1 & 34[2]) gave full responsibility of power to former MoA /EAA/ to issue regulations and directives, establish a Pesticide Advisory Board and assign inspectors. The board is meant to advise the Minister in formulating policies, regulations and guidelines in relation to safe use and management of pesticides, and collect fees for the registration service provided. The Pesticide Advisory Board comprises nine members drawn from different organizations which have a stake in pesticide lifecycle management (Article 28). According to the provision the members have to meet at least four times a year and formulate criteria and rules when deemed necessary. The board also has the right to assign technical committees to work on guidelines, procedures and protocols on specific issues. Nevertheless, its functionality is being questioned.

Inspectors assigned by the EEA/ MoA or to a regional state organ in charge of the agricultural sector have the power to carry out periodic inspections of establishments which import, export, manufacture, pack, repack, label, store, sell, distribute, advertise or use pesticides to determine whether the provisions of this Proclamation No. 674/2010 and the regulations and directives issued pursuant to this Proclamation are being complied with, carry out post-registration surveillance, inspect certificates, permits, licenses, records or other documents, take samples of any product for analysis, seize or close stores and shops according to Article 30(1)a-i; 30(2-4). However, no full efforts are exerted to seize counterfeit products and sue violators due to lack of inspection and law enforcement capacity. Though the country has a pesticide life cycle management policy, huge gap exists between the policy on paper and its implementation in practice (Mengistie et al., 2015). In summary, pesticide registration, certification and inspection are largely challenged by:

- capacity limitations (both technical and laboratory) of the regulatory body in pesticide registration and post –registration monitoring and inspection, and
- ability in law enforcement rather than the legal framework, provisions, rules and regulations.

Therefore, building capacity of the federal regulatory authority and regional regulators, and other involving institutes like MoA in the pesticide life-cycle is a corner stone for improving the pesticide life cycle management in Ethiopia.

## 2.2 Overview of pesticide use in Ethiopia

Crop production and productivity in Ethiopia is still very low. One of the major reasons for this low productivity and production is damage to crops by both regular and migratory pests (Damte, 2022). Pesticide is a critical input for enhancing agricultural productivity in Ethiopia's food system. The use of synthetic pesticides to control pests is a common practice both in the smallholder and commercial agriculture. The 114 companies that are registered in the country, the so-called registrants, source pesticides from manufacturing companies in Asia, mainly China and India, and very few products from Europe (MoA, 2021). Until 1990s the country's annual pesticide use was about 3,000 tons, off which 71% were insecticides, 25% herbicides and 3% fungicides (Abate 1997). Since 1998 the use of pesticides has shown a 1.4% increase annually<sup>3</sup> (Negatu et al., 2016). In the period 2000 to 2016 the average annual use of pesticides amounted to 5.2 tons (Mulat, 2023).

Currently there are over 400 registered pesticide products in Ethiopia of which 82% belong to the WHO hazardous classes Ia, Ib, II, and III<sup>4</sup>. Class Ia (extremely hazardous) comprise 1.5%; Ib (highly hazardous) 4%, class II (moderately hazardous) 48%, class III (slightly hazardous) 15%. Class U which is unlikely to cause acute poisoning when used properly is 15% (Assefa, 2011). During the 2020/21 cropping season about 6.85 million smallholders applied pesticides on an estimated crop area of 4,456,912 ha. Most of the crop area to which pesticide was applied was under teff (1.6 million ha) and wheat (1.2 million ha) (CSA, 2021). Among pesticides, herbicides are largely used on cereals for the control of broadleaved and grass weeds (ATO, 2020). The use of insecticides and fungicides is mostly practiced on vegetable crops and on wheat for rust control. Some of the major, recurrent pest outbreaks are desert locust, armyworms, bollworms, birds and emergence of new species such as fall armyworm and tomato leaf miner. The main challenge is the continued use of the older generation of pesticides which are often more hazardous. The increasing diversity of pests coupled with high application rate and frequency of old molecules is impacting on human health and the environment. Indiscriminate use of pesticides coupled to intensified pest outbreaks results in resistance building up, has an adverse effect on biodiversity, and results in an increased bioaccumulation of pesticides in crops, livestock products, soil, water, and aquatic organisms (Siraj and Ejeta, 2022). Though not quantified, extended and long use of old products is anticipated to develop resistance in the target pests, which is echoed in increased economic cost of pesticide purchase, application and pesticide life cycle management.

Use of existing and development of new bio-pesticides is a major opportunity to minimize the negative effects on human and environment health. However, the high cost of the development of new and safer molecules is a major hindrance. In general, the Ethiopian importers stick to old pesticides because of their cheaper price internationally, and high profit margin (>100%) in the local market and affordability by local farmers.

Weakness in pesticide inspection and control has resulted in the importation or smuggling, counterfeit pesticides and use of some pesticides that are highly hazardous, banned, restricted or not registered. Little information is also available on bio-pesticides and growth regulators. On the other hand, sustainable production requires availability of low-risk and bio-pesticides as well as the implementation of integrated pest management, which is totally neglected in the semi-commercial and commercial production and food systems. Despite the fact that pesticide use in Ethiopia has long history, its environmental, social and

<sup>3</sup> <https://www.reportlinker.com/clp/country/13/726253>

<sup>4</sup> The WHO classification is based on primarily on the acute oral and dermal toxicity - <https://www.who.int/publications/i/item/9789240005662>

economic impacts have never been studied deeply. Therefore, it is suggested that future pesticide test and use should focus on low-risk pesticides including bio-pesticides that potentially are safer and compatible to Integrated Pest Management (IPM).

Research has confirmed some of the challenges such as the lack of knowledge by farmers on use and storage of pesticide (Mergia et al., 2021; Alshalati, 2021; Damessa et al., 2021; Negatu et al., 2016), injudicious use of pesticides (Adamu & Abebe, 2021), pesticide residues in food (Siraj and Ejeta, 2022), environmental and health risks (Sishu et al., 2022; Negatu et al., 2021), absence of coordination among private actors (Mengistie et al., 2016) and organizational challenges (Wood et al., 2018).

## 2.3 Challenges and opportunities in the pesticide life cycle

Participants were requested to identify the major challenges and opportunities in the pesticide life cycle. This was the basis of discussion and led to the identification of priority leverage points<sup>5</sup>. Accordingly, participants identified and prioritized the challenges, opportunities and leverage points of the pesticide life cycle in Ethiopia (Annex II). Strategic options and specific activities on selected leverage points have been suggested to better address the pesticide life cycle challenges in Ethiopia. Potential courses of actions to be taken were recommended and responsible organizations identified (Annex II).

### 2.3.1 Registration

In Ethiopia pesticide registration is governed by legislation, which includes testing, registration, labelling, inspection, quality control, enforcement, and data management. The Ethiopia Agriculture Authority (EAA) has been authorized by proclamation No. 509/2022 to regulate pesticide registration and use in the country (Negarite Gazette, 2022). The main mandates of EAA include issue and provide certificates after evaluating efficacy, quality and safety. It also renews, suspends and revoke registration certificates of pesticides after post-registration monitoring and inspection results. Moreover, it issues, renews, suspends and cancels of Certificates of Competency (CoC) to institutes involved in importation, formulation, repacking, storage, marketing, and disposal /container management. Furthermore, the authority issues pre-import permit, import release permit and export permit for pesticides.

All products submitted for registration need information on emergency measures in cases of accidental exposure or poisoning, emergency procedures in case of fire/spillage, use, minimum label requirements, country-specific requirements, and content of a label. Pesticide registration requires research on the efficacy of the pesticide proposed for registration. The responsibility to generate pesticide efficacy data has been given to the national agricultural research system including higher learning institutions. The procedure includes testing on a target pest, compiling data, and generating a report, which is submitted to the EAA/MoA for evaluation and possible registration of the product. The approved pesticides after registered are imported by the registrant.

Regardless of the good policy environment, there are some challenges such as a lack of pesticide life cycle management strategy, waste disposal directive, physical and human capacity in pesticide residue analysis and toxicology, a long and complicated registration process, inconsistency in active ingredients content between registered and imported agrochemicals, failure to avoid stockpiling of obsolete pesticide, limitations in exercising inspection and enforcing the law are some of the challenges standing in front of the registration process. On the other hand, the presence of the proclamation, regulation, directive, guideline, standard and authorized institute are an opportunity for the registration process of pesticides.

### 2.3.2 Import and formulation

The Ethiopian pesticide legislation allows importing or locally formulating of pesticides. The main source of pesticides is importation from international manufacturing companies. There are over 114 importers known as 'registrants' in the country (MoA, 2021). They import formulated pesticides from international

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<sup>5</sup> Leverage points are critical points in a system where intervention has a major impact

manufacturers. Major challenges for importers are shortages of foreign currency, containers and shipping vessels, high freight cost; delayed delivery (3-6 months), lengthy clearing process at inland dry ports; weak inspection, controlling and law enforcing mechanism on illegal imports of unregistered and counterfeit products.

Ethiopia only one local pesticide formulating company 'Adami Tulu Pesticide Formulating Company' which was established in 1987. The company is engaging in formulating liquid, dust and water dispersible powder insecticides, fungicides and 2,4-D 72% SL dimethylamine salt herbicide for the agriculture and public health sectors. The company uses imported active ingredients and solvents, carriers, and adjuvants. Adami Tulu formulates 2.4 million kg of dust & wettable powder, 4.5 million liter of liquid pesticides, 2.4 million kg of water dispersible powder pesticides, 0.5 million liter of 2,4-D 72% SL dimethylamine salt herbicide and 2.2 million kg of micronized diatomite per year. Nevertheless, the company is constrained by lack of legislative support, lack of an accredited laboratory for generating data for batch certificate, lack of local institute that certify good laboratory practice, lack of environmentally friendly formulation supply, low aesthetics quality, limited number of raw materials and technology providers; lack of interest from foreign and local financiers to invest in the sector due to unattractive policy towards manufacturers, and expensive running costs. Conducive industrial and agriculture policy and strategy, regional agreement for the free market such as the East-Africa Community (EAC) and the World Trade Organization (WTO) as well as tax exemption for manufacturers and the pesticide sector are among the major opportunities for the formulating company.

### 2.3.3 Marketing

Pesticide traders (importers, wholesalers and retailers) are legally required to be licensed and obtain CoC from the EAA or regional regulatory bodies prior to engaging in the business. The Ethiopia agricultural business cooperation (EABC), cooperatives, one stop shops, private traders including importers are involved in pesticide marketing. In rural areas farmers purchase pesticides from private retail shops, primary cooperatives and on the open markets. The protected commercial and open field commercial farms obtain pesticides from importers or wholesalers.

Problems associated with pesticide marketing are shortages of foreign currency and high exchange rate, high interest rate on bank overdraft facility and lack of import credit; consignment delay, imbalance between demand and supply; active ingredient content and efficacy variation among batches; inefficient distribution channels; strong brokers involvement at different levels of the marketing segment; market saturation by counterfeit products, unfair market competition and sabotage are main challenges that call for due consideration. A high demand of pesticides by farmers and organized cooperative to distribute and to reach end users are the opportunities of the marketing system of pesticides.

### 2.3.4 Transport and storage

There are provisions on quality and standards of transporting and storage facilities. However, pesticides are transported by conventional cross boarder trucks from Djibouti port to dry ports in containers. Once inspection is completed then to warehouses of importers by any of the transporting facilities. Retailers and smallholder farmers transport pesticides by truck with food items, on the back of donkeys, mules or horses, in minibuses and Bajaj with passengers or carry it on the shoulder. Lack of observing the stipulated provisions in relation to transporting hazardous goods is one of the major challenges in pesticide life cycle management.

Constructing standard pesticide storage facilities at major distribution sites is an important step in its life cycle management. Imported pesticide consignments are dislodged from vessels at ports of entry (mainly Djibouti) and transported to dry ports using trucks which are not meant for moving pesticides. However, the legislation mandates importers and local distributors to have standard stores. Retailers often store pesticides in below standard storage facilities while farmers store pesticides in their houses, often under their bed or hang it on the wall near their beds, which usually predispose family members and animals to exposure. Thus, transporting and storing pesticides below standard facilities is a major challenge that needs awareness creation and law enforcement. Acquiring special transporting vehicles and at farm level storing pesticides outside of living quarters and out of reach of children and animals needs special training and technical support.



### 2.3.5 Pesticide use

The final handlers of pesticides are in general smallholder farmers, as well as labourers on commercial farms. Farmers obtain pesticides from small retail shops, cooperative and open markets. Whereas protected commercial and open field commercial farms obtain pesticides from wholesalers and EABC.

The government of Ethiopia has developed a pesticide policy to control the import of hazardous pesticides to prevent the contamination of the environment and minimize the effects on human health (Number 674/2010). The Ethiopian pesticide law covers the whole life cycle of pesticides. Generally, there is no significant gap in the policy environment on pesticide use and control.

Extension workers and development partners usually provide training to farmers on improved agricultural production technologies and practices. However, most farmers did not receive enough training regarding pesticide use and waste disposal. Consequently, most small-scale farmers do not use protective equipment, which might also not be available. Because of knowledge gap and weak enforcement in pesticide use, small scale and commercial farms do not respect the rules of safe and responsible application of agro-chemicals, which pose health and environmental risks (Mergia et al., 2021; Alshalati, 2021; Damessa et al., 2021; Negatu et al., 2016). Users of pesticide are facing challenges because of lack of knowledge, prevalence of adulterated products, high price of agrochemicals, lack of product diversity as required by customers, low product perception of local customers, ineffectiveness of pesticides and low enforcement of policy. Large available land and conducive environment for crop farming, high demand from neighbouring countries and growing winter wheat and irrigated vegetable farming are some of the opportunities of pesticide use in Ethiopia.

### 2.3.6 Waste disposal

Pesticide waste disposal is a process of eliminating unused chemicals and their containers in a way that does not create serious hazards to human health and the environment. Pesticides are dangerous goods that require special care and handling. Thus, following safe, responsible and effective procedures for pesticide use and handling help in protecting the environment, water bodies, and human health. This in turn requires knowledge, skill, facilities, capacity (technical and financial), supportive legislation and guidelines. Moreover, the side effects of pesticides on human health and the environment have been substantial and the problem is being aggravated by the low level of understanding of farmers and other end users coupled with lack of law enforcement, which lead to misuse and abuse of agrochemicals and their containers.

In between 2001 to 2012, Ethiopia has disposed of about 3,000 tons of obsolete pesticides and over 800,000 empty containers with financial support from CropLife International, the Finish and Japese governments as well as FAO through the Africa Stockpile Programme. The main reasons for the high quantities of obsolete pesticides accumulation were that for a long time the government used to make bulk purchase and distribute pesticides evenly over regions for free in fear of migratory pest outbreaks, regardless of where the product was needed. The country also received free pesticide aid from Japan without considering demand (CropLife international, 2012).

The pesticide disposal system is constrained by the existence of huge amount of obsolete pesticide stock, distribution of expired products contributing to stockpiling, absence of technical capacity and facilities for regular disposal of obsolete pesticides and empty containers, lack of directives, and expensive disposal cost. The most common way of disposing empty pesticide containers by the majority of smallholder farmers is throwing in the open field, burying, using for water fetching or storing food items while the application of the triple-rinse method<sup>6</sup> can avoid exposure to potential residues left over in the containers. In general, misuse and abuse of pesticides and improper disposal of empty containers is causing harm to human, animals and the environment. Therefore, to avoid future accumulation of obsolete pesticides and empty containers, it is important to fill the shortcomings in the policy environment, build capacity of responsible institutions, professionals and farmers, create awareness among the public and main market actors on the environmental and human health hazard being posed by pesticides, take enforcement measures, and start practicing IPM.

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<sup>6</sup> <https://croplife.org/crop-protection/stewardship/container-management/triple-rinse/>

***In summary:*** Among stakeholder identified challenges the following were prioritized:

- inadequate capacity for pesticide registration
- low quality of products;
- adulteration, smuggling of counterfeit products;
- misuse and abuse;
- weak capacity of the regulatory system;
- fragmentation of responsibility between institutions;
- lack of coordination and collaboration among responsible bodies;
- stockpiling of a huge amount of expired pesticides mainly under government holdings;
- failure to protect workers against pesticide exposure and consumers against residues in food and the environment;
- lack of motivation, technical and financial capacity of the government for disposing the obsolete pesticides;
- lack of effort in implementing pesticide use-reduction strategies, targeted interventions, and resource mobilization are the major ones.

# 3 Leverage points and Opportunities

After identification the following consensus was reached on the leverage points, and opportunities.

## 3.1 Leverage points

- **Legislation on registration and enforcement:** preparing pesticide life cycle management strategies and relevant legislations and exercising law enforcement rules in accordance to the provisions.
- **Import and formulation of products:** diversifying source of active ingredients and increasing access to foreign currency. It is important to look into the financial policies in relation to hard currency allocation and bank loan permit for pesticide importers and local formulators, finalization of local formulation and re-packing legislations.
- **Transport and storage:** increase number and volume of standard pesticide storage and transportation facilities. Formulate relevant specific legal tools for transportation and storage of pesticides. Take serious legal actions if found transporting hazardous materials with food, feed and human in public vehicles.
- **Marketing:** Strengthening the branch offices or regulatory centres for inspection and enforcing the law with regard to pesticide marketing to control or minimizing illegal importation of unregistered or smuggling of counterfeit products across the border.
- **Use of pesticides:** end users are mostly farmers, thus primarily improving their knowledge base on field monitoring, pest identification, product and sprayer selection, personal protective device usage, spray solution preparation, field application, and safe storage of pesticide remains and containers is anticipated to minimize misuse and abuse of pesticides. Equally important is capacitating development agents, woreda experts, spray service providers and (local) pesticide dealers.
- **Waste disposal:** building capacity of relevant federal and regional regulatory institutions and staff, creating awareness on stock management, finalizing the directives on waste management and exercising law enforcement are critical steps to be taken for efficient and sustainable pesticide life cycle management.

## 3.2 Opportunities

- Availability of supportive industrial and agriculture policy and regulation on pesticide registration, formulating locally or importing and marketing and control;
- Regional agreement for free market EAC and WTO and tax exemption for manufactures;
- A recent establishment of a separate and independent pesticide regulatory body;
- Existence of responsible institutions (MoA, MoH, EAA);
- High demand of pesticides with large market outlets as the country is endowed with vast agricultural land, diversity of crops species hosting numerous pests, and emerging demand from neighbouring countries;
- Limited pesticide portfolio, calling for further research, product development, testing and use of safer synthetic and biopesticides;
- Unstudied topics (residues in food, feed and the environment; impacts on human health, soil, water bodies, wild life, ... etc.) in the domain of pesticide life cycle in Ethiopia; and
- Availability of ample experience and lessons from other countries to adopt on pesticide lifecycle management.

## 4 Way forward

- Primarily identifying and **filling the policy, proclamation, directive, rule, regulation and standard gaps** in the legislation is necessary to fully exercise the roles, responsibilities and the power given to EAA/MOA.
- Low capacity and weaknesses are apparent with regard to full pesticide life-cycle **regulation**, and lack of coordination between federal regulatory i.e., EAA and regional regulatory bodies/RRB/. Thus, strengthening the federal pesticide regulatory body by building and furnishing regulatory facilities, improving technical capabilities of EAA and the regional regulatory bodies and **improving collaboration and coordination** amongst is essential.
- Creating **awareness on pesticide risks**; enhancing availability and affordability of and the control mechanism over the quality of spray equipment, application techniques, and use of personal protective equipment (PPE) must receive primary attention to minimize pesticide poisonings during loading or unloading, transporting, solution preparation, field application and cleaning equipment.
- **Improving knowledge and skill base** of traders, distributors, farmers and the extension workers on pesticide life cycle management is an essential step for effective and long-lasting use of products. This can be done through organizing trainings and awareness creation events by professionals from regulatory authority, the research system, universities and development partners who have rich experiences in the subject matter.
- National guidance on **safe disposal of obsolete pesticides**, including guidance on collecting empty containers from farmers is a necessity.
- In addressing the gaps in **monitoring pesticide residues in food, feed, soil, and water**, a national regulatory system has to be developed to collect and synthesize data; publicise the contamination level and its effects on health and the environment.
- **Registration and development of biopesticides**; creating demand and use. Therefore, making grants available for researchers, entrepreneurs, producers, and marketers will help to enhance production and availability of biopesticides. Priorly, prepare a registration legislation for non-chemical alternatives like biopesticides.
- There is a need to prepare **pesticide life cycle management extension guidelines** in different local languages that convey clear messages on how to implement the necessary practices at each life cycle stage.
- **Integrated pest management (IPM)** is one of the strategies in minimizing pesticide risks to human health and the environment. Thus, it is very important to demonstrate and promote IPM in order to create wider awareness and facilitate the adoption of IPM.



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## Annex I: List of participants

Full name	Institution
Dejene Abesha	RED&FS Secretariat, MoA
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Kidist Alemu	Markos PLC
Ferdu Azerefegne	Hawassa University
Arega Bedada	Adami Tulu Pesticide Company
Dereje Gessese	Ethiopia pulse and oil seeds processing and export association (EPOSPEA)
Wubishet Alemu	Lions international trading
Bayeh Mulat	FAO
Kirubel Getachew	SNV-Horti-LIFE
Yidnekachew Wondimu	World Vegetable center
Wubishet Beshir	Stichting Wageningen Research Ethiopia - Ethio-Netherlands Seed Partnership
Irene Koomen	Wageningen University & Research
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## Annex II: Challenges, leverage points, provisions and gaps in the regulations

Challenge/process	Leverage point	Provision, articles, sub articles, ...	Responsibility	Observation
<b>Legislation / Registration</b>	<ul style="list-style-type: none"> <li>Directives on disposing contaminated soil &amp; equipment;</li> <li>Database creation &amp; digitalizing registration &amp; certification</li> <li>Lack of provisions on biological products &amp; (HHPs),</li> <li>Lack policy on sub-standard/counterfeited pesticides (prohibited by law)</li> <li>No fulltime staff on pesticide registration</li> </ul>	<ul style="list-style-type: none"> <li>Articles 3-13 describe all the requirements for registration and certification; Article 14(1,2) &amp; (3)a-I;</li> <li>On bio-pesticides: Article 30(1)g</li> <li>Record keeping article 32(1-3)</li> <li>When breached penalties in Article 33</li> </ul>	<ul style="list-style-type: none"> <li>EAA/ MoA/MoH/R RB</li> </ul>	<ul style="list-style-type: none"> <li>No gap</li> <li>Lacks law enforcing body</li> </ul>
	<ul style="list-style-type: none"> <li>Weak coordination &amp; collaboration between regulating and law enforcing institutions</li> </ul>	<ul style="list-style-type: none"> <li>Not shown how the advisory board member institutions &amp; stakeholders link to each other</li> </ul>	<ul style="list-style-type: none"> <li>-</li> </ul>	<ul style="list-style-type: none"> <li>The linkage is missing</li> </ul>
<b>Certification</b>	<ul style="list-style-type: none"> <li>Professional staff hiring is temporary</li> <li>Companies do not hire professionals permanently (except few)</li> <li>.....</li> </ul>	<ul style="list-style-type: none"> <li>Articles 15-17 state required competency, licensing, and getting permit from the authorized body</li> </ul>	<ul style="list-style-type: none"> <li>RRB/ EAA/ MoA</li> </ul>	<ul style="list-style-type: none"> <li>No gap in the policy</li> <li>Law enforcement</li> </ul>
<b>Import &amp; formulation</b>	<ul style="list-style-type: none"> <li>Improving financial policy (hard currency and bank loan permit) for pesticide importers &amp; local formulators</li> <li>Limited raw material sources for active ingredient importation for formulating locally</li> </ul>	<ul style="list-style-type: none"> <li>Manufacturing and formulating permit is acquired (Article 15(2)a-b),</li> <li>Import permit: Article 17(1-5)</li> </ul>	<ul style="list-style-type: none"> <li>RRB/ EAA/ MoA</li> </ul>	<ul style="list-style-type: none"> <li>No gap</li> <li>Agriculture sector is 2nd priority in access to hard currency permit, following public health</li> <li>Liquidity problem</li> <li>Corruption</li> </ul>

Challenge/process	Leverage point	Provision, articles, sub articles, ...	Responsibility	Observation
<b>Use of pesticides</b>	<ul style="list-style-type: none"> <li>Improper use of pesticides</li> <li>Limited training on proper handling &amp; use of pesticides &amp; use of personal protective equipment (PPE);</li> <li>Guidelines on use of pesticides</li> </ul>	<ul style="list-style-type: none"> <li>NO provision on safe use of pesticides</li> </ul>	<ul style="list-style-type: none"> <li>MoA, RRB/ EAA/</li> </ul>	<ul style="list-style-type: none"> <li>No provision</li> <li>Safety is given in articles 22 &amp; 23</li> </ul>
<b>Monitoring &amp; supervision (inspection)</b>	<ul style="list-style-type: none"> <li>Quality control guidelines (methods, procedures and protocols) missing/incomplete/needs updating;</li> <li>No random check of pesticides at rural vendors and farm stores for genuine, expiry dates, and proper storage;</li> </ul>	<ul style="list-style-type: none"> <li>Detail is given in Article 30(1-3)</li> </ul>	<ul style="list-style-type: none"> <li>RRB/ EAA/ MoA</li> </ul>	<ul style="list-style-type: none"> <li>No gap</li> <li>Exercise penalties in Article 33</li> </ul>
<b>Waste disposal</b>	<ul style="list-style-type: none"> <li>Improper obsolete pesticides &amp; empty containers disposal (burying, burning, throwing in field or reuse)</li> <li>No directive on waste disposal</li> <li>Lack of law enforcement</li> <li>Limited capacity building &amp; awareness creation efforts</li> <li>Obsolete pesticide stock tracking &amp; digital reporting system lacking</li> <li>No responsible organization for data management, collecting and disposing obsolete pesticides</li> <li>Most expired stock is under government holdings</li> </ul>	<ul style="list-style-type: none"> <li>Article 21 (3) on proper disposal of pesticide waste &amp; empty containers</li> <li>Penalty: Article 33(1)g (5-10 prison + 25-50K fine)</li> <li></li> <li>Any person who imports or sells pesticides shall be responsible for the disposal of any pesticide that he generates (Article 5 (18) 2012)</li> </ul>	<ul style="list-style-type: none"> <li>RRB/ EAA/ MoA</li> </ul>	<ul style="list-style-type: none"> <li>Lack directive</li> <li>Exercising the penalties in Article 33(1)g</li> </ul>
<b>Analysis</b>	<ul style="list-style-type: none"> <li>No laboratory &amp; analyst</li> <li>Absence of national MRLs in food &amp; feed</li> <li>Failure in developing capacity through the past 50 years of pesticide use on plant and animals</li> <li>Laboratory capacity to analyze active ingredients, physical and chemical properties of formulations;</li> </ul>	<ul style="list-style-type: none"> <li>Article 24. Designation of official laboratory and analyst</li> <li>Article 25. Certificate of analysis</li> <li>Article 26. Residue analysis</li> </ul>	<ul style="list-style-type: none"> <li>EAA/ MoA, MoH, Conformity assessment authority</li> </ul>	<ul style="list-style-type: none"> <li>No capacity</li> </ul>

Challenge/process	Leverage point	Provision, articles, sub articles, ...	Responsibility	Observation
<b>Human &amp; animal health</b>	<ul style="list-style-type: none"> <li>Sever exposure of agricultural workers to pesticide contamination/poisoning</li> <li>Lack of standard/quality PPE supply</li> <li>Lacking reporting system and database on pesticide poisoning cases;</li> <li>No enforcement on commercial farms to hire qualified crop protection expert or at least trained personnel</li> <li>Low awareness of the public</li> <li>Risk analysis (acute poisoning) during pesticide application (during solution preparation; field application, outbreak campaigns, public health pesticide applicants, farmers, spray service providers and consumers);</li> <li>Limitations in consumer protection against residues in food and feed (MRL determination capacity);</li> <li>Blood test for chronic poisoning (illnesses) on personnel with permanent exposure to pesticides (workers at laboratory, field, storage, transporting facilities ... etc.);</li> <li>Residue analysis on food, feed and water (via direct spray, drift, run-offs)</li> </ul>	<ul style="list-style-type: none"> <li>Article 22(1-3). Occupational safety</li> <li>Article 23(1-3). Reporting of accidents</li> </ul>	<ul style="list-style-type: none"> <li>EAA/MoA/RRB</li> </ul>	<ul style="list-style-type: none"> <li>Directives on many of the are missing</li> <li>Capacity not built</li> <li>No law enforcement</li> </ul>
<b>Environmental safety</b>	<ul style="list-style-type: none"> <li>Soil and water pollution testing</li> <li>Plant tissue test (treated with pesticides &amp; neighbouring plants)</li> <li>Limitations in environment protection against residues</li> <li>Knowledge gap of applicators, farmers, experts and traders on the danger from pesticides pollution of the environment.</li> </ul>	<ul style="list-style-type: none"> <li>MoA is delegated to issue regulation &amp; directives on issues related to pesticide management</li> <li>EPA is responsible all environment related issues</li> </ul>	<ul style="list-style-type: none"> <li>EPA, MoA, EAA/RRB, MoH</li> </ul>	<ul style="list-style-type: none"> <li>No capacity in MoA</li> <li>Clear demarcation of responsibilities &amp; roles is missing</li> <li>Lack law enforcing body</li> </ul>



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Resilient Agriculture for  
Inclusive and Sustainable  
Ethiopian Food Systems  
(RAISE FS)

[www.raise-fs.org](http://www.raise-fs.org)

Stichting Wageningen  
Research Ethiopia

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the Ethiopian food system. RAISE-FS will develop and  
implement a demand-driven and interdisciplinary  
approach to Research for Food System Transformation  
(R4FST) and as such contribute to the Government of  
Ethiopia's transformational agenda.

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