

Subject: Provide support to PPD to take appropriate measures on regulating chemicals

Running title: Consultants meetings report

Introduction

Pesticide as any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, and any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant. Pesticides include insecticides, rodenticides, fungicides, herbicides, and other substances designed to kill target organisms (U.S. EPA 2013).

There are numerous consumer products licensed as pesticides that are readily available in stores, including cleaning products, pest traps, and lawn care products. There are a number of different types of pesticides consisting of various chemical properties and designed for many functions. Some examples are organophosphates, carbamates, organochlorines (many have been removed from the market due to their environmental effects), and pyrethroids. Pesticides have various effects on target and non-target species. They can disrupt the central nervous systems, alter behavior, cause endocrine system dysfunctions, affect immune systems, and inhibit growth in organisms (Mitra et al. 2011). The Environmental Protection Agency (EPA) under the authority of FIFRA regulates pesticides for use in the United States. The EPA requires the pesticide manufacturing company to determine the risk of the particular pesticide to certain test species using toxicity studies based on a standard protocol. This testing is mandated before registering the pesticides for commercial use. Pesticides are registered for use with certain restrictions based on the results of the toxicity tests. Once the pesticide is registered for use by the EPA, the states can either adopt the same list of pesticides or apply a more strict selection. States then register pesticides under specific state pesticide registration laws.

The Rift Valley/Red Sea flyway is the second most important flyway for migratory soaring birds (raptors, storks, pelicans and some ibis) in the world, with over 1.5 million birds of 3 migratory soaring species, including five globally threatened species, using this corridor between their breeding grounds in Europe and West Asia and wintering areas in Africa each year.

Sudan is home to an estimated 653 species of birds (Avibase 2020), and it ranks third among African countries used as flyways by migratory birds. It is spending the winter in Sudan, it returned to the breeding grounds on April.

Bird species that inhabit farmland or use farmland during migration (and in breeding and wintering areas) are at risk of exposure to pesticides used for crop protection, even if used normally per labeled requirements. Effects on birds arising

unintentionally from the approved use of pesticides in agriculture are inherently variable (Hart 2008).

The pesticides use in Sudan started in 1949 with the introduction of the chlorinated hydrocarbon DDT for the control of cotton jassid (*Jacobiasca lubica* deBerg) in Gezira scheme. This followed by the introduction of the organophosphate compounds, namely parathion in early 1950s and became a reliable partner to the organochlorines for the control of the complex of chewing and sucking insect pests, when dimethoate was first used in 1960/61 season.

The majority of the imported chemicals are used in the agricultural sector specially the irrigated schemes in central Sudan. Cotton (47% of annual import) is the major crop receiving most frequent spray followed by, vegetables (26%), sugarcane (15%), national pests (Plant Protection Directorate (PPD), 7%) and public health sector (2%). Spraying of cotton, sugarcane, and wheat (especially in irrigated schemes) is under the direct control of the ministry of agriculture (PPD).

The first meeting of the consultant's team was held on 24th September 2022 at the Faculty of Agriculture, University of Khartoum, to discuss the effects of pesticides of migratory soaring birds and other local birds. The discussion started by introductory about the importance of migratory soaring birds in the wildlife and the threats that face their existence in life that cause by abuse of pesticides to control agricultural pests.

The discussion of the team consultants covered the following main points;

- 1- Many types of pesticides use in Sudan to control agricultural pests including national pests (desert locust, *Quelea* birds, Dura Antad, etc.) without any consideration of risk that can face migratory birds due to the intensive spraying of such chemicals.
- 2- Some pesticides enter the country by smuggling and illegal ways, and there is no any available information of their toxicity, concentration and the pests

that registered for, definitely such pesticides can affect migratory birds and can make a fatal or unexpected risk to non-targeted birds. The use of obsolete and mixing of incompatible pesticides to control agricultural pests can result in a high damage and contamination to environmental different components and biodiversity as well.

- 3- The absence or lack of awareness from the governmental institutions or corporations particularly extension service centres regarding the use and application of pesticides in agricultural sectors and this gap should be filled by raising awareness workshops.
- 4- Fenthion is the only designated avicide to control Quelea birds in Sudan and weaver birds and other pest-birds in many parts of the world. The pesticide is classified by US, EPA as restricted use pesticide (RUP). The group discussed also the last workshop held by 2014 regarding the use of fenthion to control Quelea birds which concentrated to find an alternative pesticide to control such birds.
- 5- Types of registered pesticides in Sudan with their common and trade names; the team required from Miss Ahlam Hassan to provide recently and updated list for the last 5 years (attached).

The following recommendations drawn from the discussion resulting from series of meeting to support PPD to appropriate measures on regulating agrochemicals are itemized below;

Recommendations

1. Substitute (remove and replace) substances of high risk to birds

An effective pesticide regulatory system limiting effects on birds includes both preventative and evaluative factors to ensure substances of high risk to migratory birds are not permitted for use in activities that could result in exposure of migratory bird populations and allow for removal of substances if evidence indicates risks to migratory birds from their use.

2 Include criteria on birds when prioritizing areas for obsolete pesticide removal programs.

Many developing countries import pesticides to increase agricultural production and control vector-borne diseases such as malaria. Over time, unused pesticides become obsolete and unsafe for use.

Often, the most harmful substances for birds are older compounds. Many of the now highly regulated stocks of pesticides exist in stockpiles throughout the Rift Valley/Red. These obsolete stocks are owned by national governments (eg, locust control insecticides) and by farmers.

3. Install pesticide container management scheme

The management of pesticide containers is a significant factor in preventing risks of bird poisoning. Containers need sufficient labelling requirements so that their contents are used correctly; and when they are finished or no longer needed, adequate disposal to limit likelihood of containers being re-used for counterfeit products or contributing to stockpiles of old and/or obsolete products.

For a successful container management scheme it is important to engage and involve all stakeholders, particularly in the development of the scheme.

4. Incorporate effects on birds into Integrated Pest Management principles

Integrated pest management (IPM) is a strategy that encourages the reduced use of pesticides by employing a variety of pest control options in combination to control and manage pests. IPM protects crops from yield losses while offering the least amount of disturbance to ecosystems. Effective IPM reduces pesticide use, thereby reducing likelihood of exposure of migratory birds to pesticides, and should be the first course of action for fighting crop pests.

5. Create restricted pesticide zones in high risk areas

In high-risk areas, such as bottleneck sites, insecticides of risk to birds can be limited by creating restricted pesticide zones. These zones would restrict the use of pesticides of high risk to birds and could include existing protected areas and

public areas. A network of restricted pesticide zones throughout the Red Sea Flyway may be an effective way of ensuring a reduction in exposure to pesticides within high-risk sites.

7. Apply integrated pest management to change cropping strategies and reduce pesticide use to control Quelea

Crop protection strategies should be developed for each particular damage situation. The FAO currently encourages the use of integrated pest management (IPM) approaches, such as working with farmers in examining all aspects of farming practices in relation to quelea damage, and seeking to minimize pesticides. It includes modifying crop husbandry, planting time, weed reduction, crop substitution (eg, maize, which quelea do not consume), bird scaring, exclusion netting, and only uses chemical control for birds directly threatening crops when other methods have failed.

8. Harvesting quelea as a food source

The nutritional content of quelea is high, with a greater calorie content than mammalian meat and around five times the protein found in staple cereals.

9. Use best practice to prevent and manage rodent irruptions

10. Restrict/ban SGAR use in open field agriculture

In many areas rodents are not resistant to the first generation anticoagulant rodenticides, which may be a reflection of a lack of historical use of anticoagulant rodenticides in the Rift Valley/Red Sea area. Therefore, the less toxic and persistent first-generation anticoagulant rodenticides (FGARs) can be effective in these areas, while minimizing the risk to migratory birds.

11. Prohibit permanent baiting

12. Apply alternative predator control methods

13. Provide compensation and/or insurance for livestock predation

14. Effective monitoring and enforcement mechanisms

15. Immediately substitute (remove and replace) diclofenac for veterinary use in domestic livestock
16. Mandatory safety-testing of NSAIDs of risk to scavenging birds.
17. The national and international agencies should do more efforts on education and training on safety in the use of pesticides.
18. Enforcement of laws and regulations as well as other guidance in area of chemical safety during handling and use.
19. Awareness rising in the whole community addressing the hazards of chemicals and how the humans and environment can be protected.
20. The used of biological pesticides, mycopesticides based on the fungus *Metariziumanisoplae* (Var.acridum) has been registered in Sudan which have limited side-effect on other groups of the organisms (birds).

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Regards;

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