

## DISCUSSION DIGEST

### Implementing Pesticide Alternatives in Urban and Agricultural Contexts

Issue 1 of 2024  
Discussion: 07 Mar 2024

This document summarises the University of Cape Town’s (UCT) Division of Environmental Health’s (DEH) Pesticide Community of Practice discussion held on the 7<sup>th</sup> of March 2024, titled ‘Implementing Pesticide Alternatives in Urban and Agricultural Contexts’. View the discussion [recording here](#), [presentation slides here](#), and [newsletter here](#). This digest presents the issues and points raised and the information shared by participants in response to three questions prepared by the presenters:

- **Silke Bollmohr** (EcoTrac Consulting/INKOTA)
- **Stephanie Williamson** (Pesticide Action Network United Kingdom – PAN UK)
- **Alexander Stuart** (Pesticide Action Network United Kingdom)

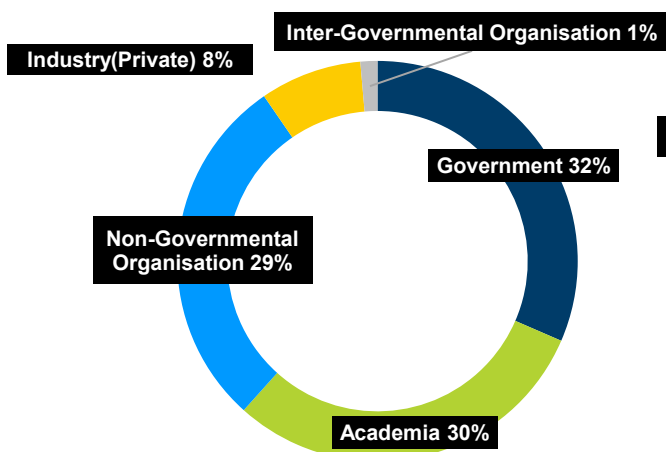
Silke described the concept of systems thinking, as it relates it to pesticide alternatives. Farming should be considered as a whole system, part of nature, understanding all parts are interconnected. In permaculture, a concept which incorporates systems thinking, the emphasis is on holistic design principles, focussing on natural pest control methods, with the goal of a self-sustaining system.

Stephanie talked about a PAN UK project aimed at reducing the high and unsustainable use of highly hazardous pesticides (HHPs) around Ziway Lake in Ethiopia. This included a “food spray” technique, which builds up natural biological control, and integrated pest management (IPM), empowering farmers to utilise agroecological practices on their farms.

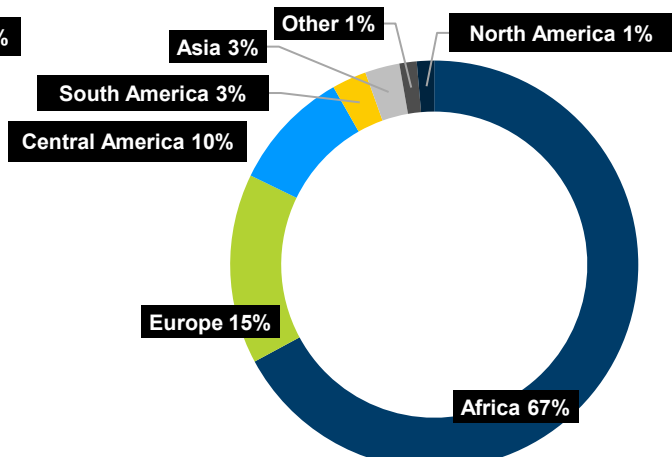
Alex discussed rodent control, explaining that the majority of chemical rodenticides are HHPs, with rodents becoming increasingly resistant to many of them. Reliance on chemicals alone is unlikely to achieve long-term control of rodent pests. Many alternatives exist, including cultural, control, and biological control methods. An integrated approach is most likely to be successful.

### Breakdown of Discussion Participant Demographics

#### Regional Representation



#### Sectoral Representation



Total = 73 participants live, 4 responses posted on the Google Form



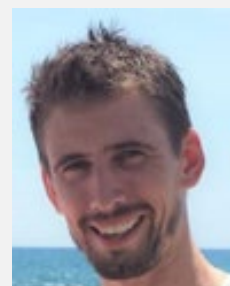
## PRESENTERS

**Dr Silke Bollmohr** is an ecotoxicologist with a PhD in environmental science and specialised expertise in permaculture design. Throughout her diverse career spanning various sectors, she has contributed to pesticide risk assessment and mitigation efforts across multiple African nations. For the past decade, Dr. Bollmohr has operated her consultancy, EcoTrac Consulting, to advocate for evidence-based policies concerning pesticide risk assessment. Her role involves providing scientific guidance to shape advocacy strategies aimed at promoting sustainable agricultural practices and advocating for the restriction of Highly Hazardous Pesticides (HHPs) globally. Dedicated to community empowerment through permaculture design principles, Dr Bollmohr has conducted training sessions in regions facing agricultural challenges, including South Africa, Kenya, and Somalia, intending to reduce reliance on agrochemicals and promote sustainability. Dr Bollmohr also serves as a senior policy advisor for global agriculture at the INKOTA (INformation, KOordination, TAgungen) network in Berlin, advocating for the prohibition of HHPs and promoting agroecological approaches on a global scale.



**Dr Stephanie Williamson** trained as an ecologist/biologist, with a Master of Science in Integrated Pest Management (IPM) and a PhD on pesticide use and impacts on African smallholders. Stephanie was formerly at the Centre for Agriculture and Bioscience International (CABI) working on biological control and IPM training. She joined Pesticide Action Network UK in 2000. She has over 30 years of experience relating to pesticide issues and sustainable agriculture, working in Africa, Latin America, Asia, and Europe. Stephanie's work covers the promotion of ecologically informed alternatives to hazardous pesticides, pesticide policy assessment, and advising food and fibre sustainability standards and companies on strategies for pesticide use and risk reduction. Along with an extensive bibliography, she has written numerous training materials including modules for the postgraduate Diploma in Pesticide Risk Management run by University of Cape Town, South Africa.

**Dr Alex Stuart** is an agroecologist at Pesticide Action Network (PAN) United Kingdom (UK). He has over 10 years of experience conducting research and training in agroecology and sustainable crop management and conducted his PhD on rodent ecology and management. Before joining PAN, Alex worked at the International Rice Research Institute, based in the Philippines and Indonesia.



## CONTRIBUTIONS FROM PARTICIPANTS

Disclaimer: The information in this digest represents the opinions of members participating from different stakeholder groups expressed during the discussion. The views expressed in this document do not necessarily represent the opinion or the stated policy of the Swedish Chemicals Agency (KemI) or DEH UCT, nor does citing trade names or commercial processes constitute an endorsement

The key discussion points raised by participants are presented under each question. Throughout the discussion, informal polls were conducted to help encourage discussion among the participants. They do not provide any representative data but rather provide a snapshot of the participants' views.

### QUESTION 1

**Have there been any efforts within your work/sector to shift away from reliance on pesticides? Give examples, including your sector and country in your response**

#### Guyana

- There are several non-pesticide methods used to deal with pests, ranging from traps to natural repellents such as flowers and plants
- The sugar industry uses flood following for 6 months (i.e. covering the fields with 12 inches of water). This helps nitrogen fixing in the soil, and weed control as a form of regenerative agriculture

#### South Africa

- In some workplaces, interior plants are cleaned and serviced frequently as a means of pest management by interior landscaping services. Bait stations, regularly serviced by pest control companies, are used for rodent control
- Vineyards use ducks to eat pests off vines. Ducks also produce fertiliser
- There is great interest in regenerative farming where farmers try to use more natural or organic means to protect their crops
- Research institutes conduct research and mass-rearing of biological control agents. Instead of using herbicides to control invasive plants, these institutes release viable agents. However, a challenge persists as many believe the process to be slow
- Efforts are common among backyard/subsistence farmers, but more challenging on a larger scale
- Biocontrol is used on invasive species like water hyacinth and cactus species to reduce the use of herbicides
- Industry: One company places significant emphasis on regenerative agriculture with growers. They are workshopping with growers, to implement a determination limit for all

crops sold. The primary focus is on soil health, along with IPM programmes for each crop. Given the major challenge of pesticide resistance, there is a heavy focus on highlighting findings and driving biological alternatives

#### Malawi

- Biopesticides have been incorporated into the regulations. Guidelines for their registration (data requirements) are available but have not yet been adopted for use
- An IPM strategy has been developed and validated. This will help farmers reduce reliance on synthetic pesticides
- More than 16 farmer field school trainers, 700 agricultural staff, and 800 farmers have been trained on pesticide risk reduction strategies including IPM through the Food and Agriculture Organization (FAO) Pesticide Risk Reduction Project between 2017 and 2023

#### Burkina Faso

- Various initiatives and strategies are in place to find alternatives to pesticides. These include legislative and administrative measures, promoting cultivation practices such as crop rotation to reduce pesticide use, and employing biological control methods that utilise living organisms to combat pests
- In 2018, an "agroecology" focal point was appointed within the Ministry of Agriculture and, in 2022, the Burkina Faso government officially adopted a National Strategy for the Development of Agroecology, which provides a



reference framework for all stakeholders to synergise their efforts

- There has been permaculture design training for college students, mostly piloted by the private sector

### Iran

- For some years back in the 20th Century various ecosystem services and applied ecology concepts (now known as agroecology) were used for IPM to control agricultural pests under Economic Injury Lines to reduce the use of agrochemicals

### Ethiopia

- Attempts for natural pest control based on plants

### Tanzania

- IPM programmes

### Madagascar

- There have been efforts to reduce reliance on pesticides, but information on the extent of these efforts is limited

### Zimbabwe

- Intercropping vegetables with plants, such as Mexican marigolds and garlic, to reduce insect pests and nematodes
- Conservation agriculture, or “pfumvudza”, looks at natural mechanisms for plant protection including the removal of plant residues to prevent pest breeding
- An Italian company is in the process of registering biopesticides

### Zambia

- There has been an effort from the Environmental Agency. An example is the provision for information on the risks of the use of pesticides, and the need to embrace alternatives

### Nigeria

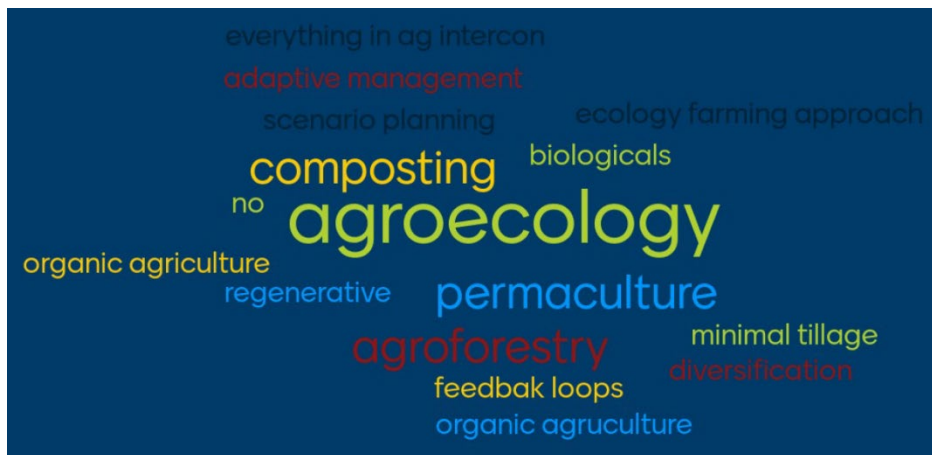
- Integrated pest control has been utilised

### Switzerland

- At the policy level, no encouragement is given to farmers to consider other options

## POLL RESULTS

### POLL 1: What systems thinking approaches in agriculture are you familiar with?



### POLL 2: Which permaculture principles do you already include in your efforts to shift away from reliance on pesticides?

Observe and interact	4
Apply self-regulation and accept feedback	3
Use and value diversity	6
Integrate rather than segregate	13





## QUESTION 2

Describe what actions specific stakeholders\* could take to enable farmers to benefit more from the pest control contribution by natural enemies? \*e.g., pesticide regulators, policymakers, industry, non-government organisations, academics, and intergovernmental organisations

### Regulators and policymakers

- Ensure farmers are informed about the advantages of natural pest predators
- Develop policies and regulations that promote the conservation and enhancement of natural predators. These may include incentives for adopting agroecological practices and restrictions on harmful pesticides
- Lobby for the necessary finances to implement natural control initiatives
- Limit harmful pesticides and promote biopesticides
- De-register/ban of Highly Hazardous Pesticides and publicise the effects of these pesticides

### Government

- Conduct training and publicity to increase uptake. In KwaZulu-Natal, a province in South Africa, the Durban Metro has an Agroeconomic department which offers such training to small-scale farmers
- Ensure that capacity-building is a priority to inform farmers about new technologies
- Lower import tax for green alternatives, and implement high import tax implications for highly toxic pesticides
- Support research, documenting, and promotion of indigenous knowledge as a means of reducing dependence on pesticides
- Redirect subsidies towards biopesticides rather than traditional pesticides and fertilisers
- The Canadian Food Inspection Agency, along with other federal departments such as Pest Management Regulatory Agency, Agriculture and Agrifood Canada, and Natural Resources Canada, has established a regulatory and management framework for numerous parasitic and predatory organisms used as biological control agents. The effectiveness of these organisms in pest control may vary regionally, but a link is provided for further consideration:  
<https://inspection.canada.ca/plant->

[health/invasive-species/biological-control-agents/eng/1514956211166/1514956212112](https://inspection.canada.ca/plant-health/invasive-species/biological-control-agents/eng/1514956211166/1514956212112)

### Farmers

- Learn how to use natural predators to control pests
- The transfer of knowledge from farmer to farmer has proven highly effective in adopting various methods
- Scale up the utilisation of proven effective alternatives

### Industry

- Development of effective strains of natural predators and biodiversity-friendly products
- Ensure farmers are informed about alternatives to synthetic chemical representatives commonly found on farms

### NGOs

- Help with training and capacity-building programs for farmers to identify and conserve natural predators on their farms/gardens
- Raise awareness and assist farmers in sustainable practices and the use of alternatives, while discouraging the use of pesticides
- Advocate for use of natural predators

### Academia

- Conduct studies on the effectiveness of alternatives like natural predators that can easily be utilised by farmers
- Share knowledge to optimise the use of natural predators

### IGOs

- Facilitate standardisation of practices and information-sharing

### General

- Farmers and regulators may not be aware of alternative methods or may lack the knowledge to implement and regulate them effectively. Therefore, it is necessary to sensitise them with coordinated action from the Ministries of Environment, Health, and Agriculture



- Government departments and private entities can collaborate to share information through symposiums, thereby equipping professionals working in the same sector
- Agricultural Extension Officers, along with the responsible Ministries and pesticide authorities, should collaborate to raise awareness about non-chemical pesticide alternatives
- Stakeholders could collaborate to provide incentives for farmers who adopt integrated pest management practices. These could include training, research support, and policy frameworks that prioritise the conservation and enhancement of natural predators for effective pest control
- Promote IPM practices that prioritise the conservation of natural predators. This could involve providing training and resources to farmers on how to identify and protect beneficial insects, as well as creating incentives for farmers to adopt IPM strategies
- Create farmer field demonstration centres where farmers can observe the results of the alternatives used

## POLL RESULTS

### POLL 1: Which methods to encourage more natural enemies into crops have you heard of before?

Using food sprays to attract predators to crops	10
Leaving some natural vegetation at field edges	16
Sowing strips of flowering plants/crops within the field	12
Avoiding the use of insecticides which harm natural enemies	15
Providing perches for insect-feeding birds	5
On-farm or in-field rearing of native predatory insects or parasitic wasps	6
Adapting an agronomic practice to avoid disturbing/provide more food/shelter for natural enemies	8
Another method (explain in the chat)	1

### POLL 2: How aware are agricultural extension staff in your country about natural enemies?

Fully aware, can identify the main groups and are actively working to encourage them in farmers' fields	2
Some awareness, can identify the best-known groups but knowledge mainly in theory, no practical experience	13
Very little or no awareness, do not appreciate their importance	6

## QUESTION 3

**In your country, what successful non-chemical techniques/methods have you come across to manage rodent pests in urban/domestic areas? Include your country in your response**

### Burkina Faso

- Trapping is a common technique where mechanical traps are set up to capture rodent pests. Natural predators are also used to manage their presence, and there has been experimentation with plant extracts as alternatives to pesticides in vegetable farming

### Malawi

- Use of different methods including predators such as cats, traps which are placed in areas where rodents are active e.g. in storerooms, and sealing cracks and holes with cement to prevent their entry



## South Africa

- The City of Cape Town has placed bait stations as a means of rodent control in the city
- Live-capture traps have been used in the country, but in rural areas and informal settlements glue traps have been used which are readily available in the streets
- Some keep cats as pets
- Sticky boards are used but might not be legal

## Iran

- Rodent-proofing buildings by sealing cracks and holes
- Using traps such as snap traps or live traps to capture rodents
- Keeping food stored in rodent-proof containers and cleaning up spills promptly
- Removing clutter and debris that can provide hiding spots for rodents
- Using ultrasonic devices that emit sound waves to deter rodents

## Guyana

- The use of sticky boards is widespread. Families tend to use these more as they are affordable and less toxic to use in households
- A campaign initiated a few years ago, which continues to this day, involves the chemical authority of Guyana

conducting training sessions across different regions of the country. The aim is to raise awareness about the hazards associated with using illegal rodenticides

- Bird resting sticks are placed in sugar cane fields to control rodents

## Germany

- A limited number of poster campaigns discourage the open disposal of rubbish or leftover food in open bins. These posters feature slogans such as "Don't feed rats" and provide information on the risks associated with discarding leftover food down toilets, as rats can gain access into households through swimming and diving
- An example of information on managing rats to the general public by the city of Kiel (Northern Germany): [https://www.kiel.de/de/umwelt\\_verkehr/tiere/\\_dokumente\\_Ratten/Ratten\\_Flyer\\_web.pdf](https://www.kiel.de/de/umwelt_verkehr/tiere/_dokumente_Ratten/Ratten_Flyer_web.pdf)

## Zambia

- Use of mechanical traps
- Keeping cats as natural predators
- Good sanitation
- Designing crop storage that discourages rodents

## Madagascar

- Trapping using wire cages to capture rats alive

## POLL RESULTS

### POLL 1: Do you think rodents in urban/domestic areas are being successfully managed in your country?

Yes	2
No	14
Don't Know	1

### POLL 2: What barriers are there to large-scale non-chemical rodent control?

- Resistance to non-chemical control methods: rodents may adapt to non-chemical control methods over time, reducing their effectiveness
- Lack of funding to implement large-scale non-chemical rodent control
- Lack of information for government departments implementing rodent control on non-toxic measures
- Education and institutional building
- Time-consuming and labour-intensive
- Poor governance is the main barrier
- Greater intent is required by municipalities
- In Uganda: lack of mass sensitisation on alternatives, ignorance, foreign influence, and lack of finance, access, and effectiveness
- Reliance on chemical methods, particularly by the government. An outbreak of rodents is handled by the



- Ministry of Agriculture in Tanzania, but they always opt for chemical methods
- Lack of organised efforts, low level of awareness, and low level of knowledge
- Limited public awareness and education: many people are not aware of non-chemical rodent control methods or may not understand their effectiveness, leading to a lack of support for these measures
- People need to change their behaviour and the way they manage waste
- Government support in terms of providing proper sanitation and waste management practices is lacking, so most people resort to "effective" pesticides which seems to be the quickest method of eradicating pests
- Lack of information on chemical dangers and the benefits of non-chemical approaches, limited research, and neo-colonialism

## RESOURCES

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**If you are not already a member, we invite you to join UCT's Pesticide Discussion Forum:**

<https://forms.gle/NzYH5REfUruL3jdm6>

The Division of Environmental Health (DEH) Pesticide Discussion Forum is a bi-monthly online seminar for pesticide regulators and resource persons, as well as students in the postgraduate Professional Masters in Chemical Risk Management (MCRM) and Diploma in Pesticide Risk Management (DPRM). Our aim is to provide support for managing pesticide risks and implementing risk reduction strategies.

DEH is based in the School of Public Health at the University of Cape Town (UCT). [environmentalhealth@uct.ac.za](mailto:environmentalhealth@uct.ac.za)

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**Acknowledgement:** Financial assistance from the Swedish International Development Cooperation Agency (SIDA), has been arranged by the Swedish Chemicals Agency (KemI)

