



## PILLAR I.3

**Agroecology as an alternative to  
HHPs and chemical fertilizers**





# IPM

Integrated Pest Management (IPM) is a term that has been somewhat abused. In its true form it is ecosystem-based and focuses on agroecological practices, using pesticides as a last resort. However, it has also been massaged into a form of 'business-as-usual' application of chemicals, in which pests are monitored and thresholds applied before spraying begins.



# Agroecology

The corruption of the term 'IPM' has led to the emergence of 'agroecology'.

Agroecology is an economically viable and socially just approach to sustainable agriculture and food systems, grounded in ecological and social principles and the integration of science with local and Indigenous knowledge and practice, emphasising farming in harmony with natural cycles and processes, and the political approach of food sovereignty.

<http://www.fao.org/agroecology/home/en/>



Small-scale family farms like this one in Latin America produce about 70 percent of our food.



# Agroecology

In 2015, the International Conference on Chemicals Management (**ICCM5**) adopted a resolution supporting concerted action on HHPs and encouraging “emphasis on promoting agroecologically based alternatives ....”.

Following that resolution, the **Stockholm Convention**’s POPs Review Committee placed emphasis on agroecology in replacements for the POP pesticide dicofol

Agroecologically-based alternatives are now included in the **Rotterdam Convention**’s *Handbook of working procedures and policy guidance for the Chemical Review Committee*.

# SDGs and Agroecology

Agroecology contributes to all the SDGs

5 examples:

***SDG 1 End poverty***: improves incomes and economic resilience

***SDG 2 End hunger***: provides safe nutritious food for all

***SDG 3 Healthy lives and well-being***: ends pesticide poisoning by removing the need for HHPs

***SDG 4 Life-long learning***: stimulates farmer-to-farmer learning

**SDG 15 Protect terrestrial ecosystems**: conserves biodiversity, natural cycles and relationships



# 5 Principles of Agroecology

1. Put farmers first
2. Promote soil health, biodiversity and natural ecosystem function
3. Integrate science with knowledge and practice
4. Promote complexity over simplicity
5. Minimise waste and optimises energy

# Agroecological Practices

Agroecology is knowledge-intensive and farmers need better access to practical, discovery learning.



Training farmers and extension staff to recognise beneficial insects and pests in the crop.

Photo: PAN Ethiopia and PAN-UK



Farmers, extension officers and scientists working together to identify the most effective practices in organic cotton in Benin.

Photo: OBEPAB and PAN-UK





# Agroecological Practices

## Biological control of pests

- A lot can be done to increase the biodiversity and encourage natural enemies into the crop



The mosaic of a diverse mix of crops and natural vegetation in smallholder farms can host many useful natural enemies and wildlife, Ethiopia.

Photo: PAN-UK



Biodiversity in this organic vineyard helps attract natural enemies of pests.



Natural pest management: dragonfly consuming a rice pest.

Photo: Jayakumar Chelaton



Ladybird larva eating aphids, a natural biological control often destroyed by insecticides.

- Natural enemies can also be introduced to the crop



A release sachet for predatory mites hangs among cucumber foliage in a greenhouse using biological controls, Germany.



Ducks have multiple benefits in rice paddy, including pest and weed control and fertility improvement.



# Agroecological Practices

## Agroforestry



Trees within cotton and maize fields provide fruits, fodder for livestock and prunings that can be used for compost or mulch; smallholder farm, Ethiopia.

Photo: PAN-UK



Agroforestry on organic farm Fazenda da Toca.

Photo: FoodTank



This permaculture food forest in Malawi mimics natural forest systems: the baobab tree forms a protective canopy over a grapefruit tree, which provides shade to the layer below.

Photo: June Walker



# Agroecological Practices

## Soil improvement and conservation



Increasing organic matter in the soil and mulching the surface, as in this organic ginger plot, helps agroecological growers cope with drought.



Healthy soils have large numbers of earthworms as well as many other beneficial organisms.



*Gliricidia* and maize growing together, with the *Gliricidia* providing nitrogen for the maize



Composting, Tamil Nadu Women's Forum, India



Contour planting, Zarcero, Costa Rica.

Photo: Fernando Rameriz



# Agroecological Practices

- No-till or reduced till farming / conservation tillage without herbicides
- Cultivational control of weeds
- Locally adapted seeds



Zai pits ready for planting, Sahel



Using mechanical weeder, Cambodia.

Photo: CEDAC



Some varieties of Mexican maize

# Agroecological Practices

## Botanical extracts



Applying a natural pest control agent.

Photo: TNWF



Low cost local inputs: organic brews, including fish amino acid and fermented plant juice, to increase soil and plant health and control pests, Philippines.

Photo: Achim Pohl



A potent homemade pest repellent of hot chili peppers and garlic for use in chayote production.

Photo: Ryan Galt



Making botanical preparations for agroecological pest management.

Photo: Alter Vida Comunicación



# Agroecological Practices

## Pest attractants and traps



Home-made trap for baiting with alcohol attractant to trap Coffee Berry Borer, Nicaragua.

Photo: Stephanie Williamson



Rows of sunflowers planted among cotton as a trap crop for pests and refuge for natural enemies.

Photo: OBEPAB



A pheromone funnel trap for mass trapping Fall Armyworm.

# Agroecology – the benefits

- Improved health and nutrition
- Improved food and livelihood security
- Conservation of biodiversity and natural resources and sustaining critical ecosystem services
- Increased economic stability and ecological resilience
- Mitigation of climate change
- Increased social resilience and community capacity



Selling organic vegetables in a market in Thies, Senegal.

Photo: PAN Africa



# Agroecology – the benefits

## An example

The following data was collected by OBEPAB in two surveys of 500 cotton farmers (50% of whom were certified organic) in Benin in 2018 and in 2019

Yields were very similar between organic and conventional growers (organic farmers achieved yields 4% and 1% higher than conventional farmers in 2018 and 2019 respectively)

Organic farmers reported significantly lower production costs, giving them **net income / ha cotton over 47% higher than conventional growers** in both years

Organic producers did better on the other crops they grow, too. They achieved an **average net income 53% higher than conventional growers across all crops**

**44-52% conventional growers reported signs and symptoms of acute pesticide poisoning.** None of the organic growers experienced such exposure

Other benefits revealed by these organic growers include greater resilience to climatic and market shocks (due in part to greater diversity of crops), greater participation of women and better school attendance by organic producers' children (the organic certification prohibits child labour)



Mme Rosaline Okou is a successful organic cotton farmer in Benin. She is proud that her food crops are safe from hazardous pesticide residues and thinks that the secret of her success has been to invest a lot of work in ensuring she has healthy soils in which to grow her crops

# Policy

Transitioning towards sustainable agriculture in the 21st century requires a decisive shift of institutional and policy support towards agroecology—made urgent by new evidence that many ecosystems are verging on collapse, the effects of climate change are intensifying, and reliance on HHPs continues to destroy the health, lives and livelihoods of communities around the world.





# How to achieve the transformational change required?

- Global processes (UN organisations, SAICM, GEF) increase engagement and support the replacement of HHPs and chemical-intensive farming with agroecology
- Supportive economic policies
- Financial incentives and market opportunities established and investments towards pesticide-use intensive ways of farming redirected

# How to achieve the transformational change required?

Agroecology is knowledge intensive, rather than chemical intensive. Farmers need better access to practical, discovery learning

- Building capacity in agroecological research, extension and innovation
- Fostering horizontal collaboration among farmers, Indigenous peoples and scientists
- Prioritising participatory research and farmer-led innovation in agroecological practices
- Small and medium scale farmers and their organizations supported



# Thank you

Please do look at the accompanying  
briefing notes for more information and  
links to other resources

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