Panel session:

How to safeguard biodiversity and support the sustainable use of natural resources

Speakers: **Dr Hariet L. Hinz, Dr Imtiaz Hussain, Dr Gina M. Swart, Marina Young, Dr Lusika Wasilwa, Marina Young**

Chair: **Professor Christian Borgemeister**

A brewing storm

How to safeguard biodiversity and sustainably use of natural resources in a planetary crisis?

Christian Borgemeister, ZEF - University of Bonn

* Image source: *icipe*

A planetary crisis in progress

Climate change

1

Biggest impacts in Global South

Societies already hugely affected

The worst is yet to come…

Image sources:
1- Greenpeace;

A planetary crisis in progress

Climate change

1

Demographic growth

2

World population to reach 10 billion by 2050

>90% to happen in South Asia & Africa

Image sources:
1- Greenpeace; 2-MIT

A planetary crisis in progress

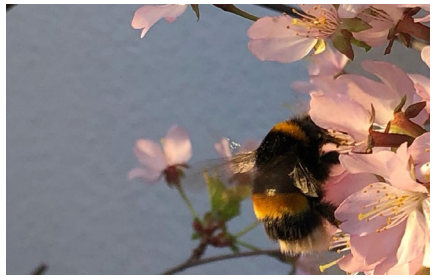
Climate change

1

Demographic growth

2

Biodiversity loss



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Presumably the 6th mass extinction

Impact on global GDP 55%

Image sources:
1- Greenpeace; 2-MIT; 3-Jaramillo

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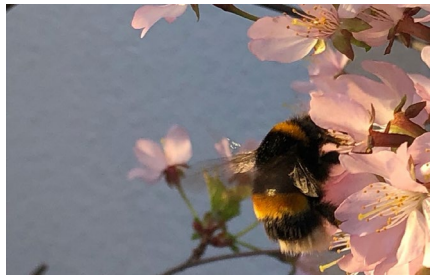
Climate change

1

Demographic growth

2

Biodiversity loss



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Global food security

4

Image sources:
1- Greenpeace; 2-MIT; 3-Jaramillo; 4-UNHCR

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Global food security

Climate change

Already huge impact on agriculture in the tropics

Important breadbasket regions in Global South will potentially disappear

Demographic growth

Today many regions can't feed themselves – e.g. Africa's annual food import bill >$ 2billon (pre Ukraine war)

Agricultural productivity growth lagging behind

Biodiversity loss

Globally important biodiversity zones like Amazon & Congo basin approaching tipping point

Critical ecosystem services like pollination & biological control significantly reduced

Image sources:
1- Greenpeace; 2-MIT; 3-Jaramillo; 4-UNHCR

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Global food security

Some major issues

More food is needed

Yet most arable land used

Expansion would come at expense of biodiversity

Unless land restored/ rehabilitated

Increasing yields possible (yield gaps)

Crucial up- and downsides of ↑yields and ↓biodiversity (sustainable intensification/ regenerative agriculture/ agroecological transition)

Trade flows (intra- & interregional)

& most importantly national & international political will

Image sources:
1- Greenpeace; 2-MIT; 3-Jaramillo; 4-UNHCR

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Implications for agriculture and natural resource use….

5

Approx. 40% of food lost pre- & postharvest to weeds, pests & diseases

Climate change & biodiversity loss additionally aggravating situation (twin crisis, they exacerbate each other)

Necessary intensification can, but not necessarily need to worsen biodiversity losses

Conventional plant protection often inefficient & environmentally hazardous

Most alternatives knowledge-intensive or often considered only suitable for niche markets

6

Image sources:
1- Greenpeace; 2-MIT; 3-Jaramillo; 4-UNHCR; 5&6-*icipe*

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What can be done? And are there any low hanging fruits??

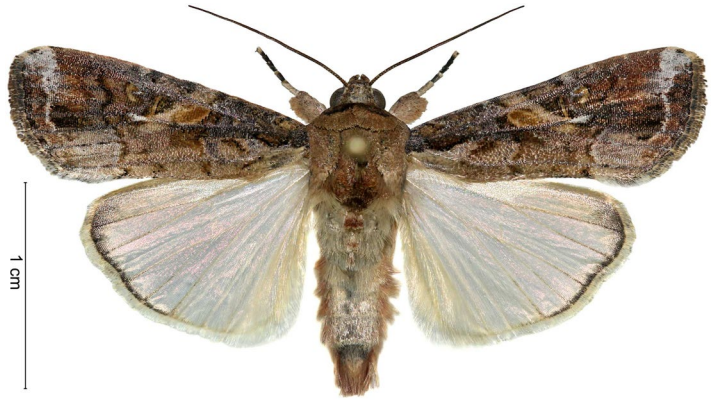

Fig 1. Adult male of *S. frugiperda* (Benin, Calavi Akassato, 6.vi.2016, G. Goergen). Photo by GG.

doi:10.1371/journal.pone.0165632.g001

Classical biocontrol against invasives is a no-brainer

Reduction of food waste & prevention and/or reduction of postharvest losses the 2 single most efficient interventions – why is nobody doing it?

Promotion of nature-based solutions in agriculture, incl. IPM & greater use of biological alternatives to highly toxic pesticides

Gene editing one of the most promising new technologies of 21st century for basically everything, why not in agriculture?

Image sources:
1- Greenpeace; 2-MIT; 3-Jaramillo; 4-UNHCR; 5-*icipe*; *6&7-icipe*; 8-IITA

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Most importantly….

A shift to system thinking!

Thank you

Image sources:
1- Greenpeace; 2-MIT; 3-Jaramillo; 4-UNHCR; 5-*icipe*; *6&7-icipe*; 8-IITA; 9-*icipe*