

“Breaking Barriers: Advancing the One Health Agenda with a Focus on Environment”

Factsheet based on the presentations and discussions in Breakout Session No.3 “Invertebrate Biodiversity Services and Invasive Species” on 12 October 2023

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Pest control impacts

Chemical footprint equivalent to annual output of 18.4 coal-fired power stations

Carbon intensive - up to 136.6 Mt CO₂ e per year

Biocontrol:

- 70–90% ↓ pesticide use -US and tropical Asia
- Benefit-cost ratio 5:1 to >1000:1
- Mitigate GHG emissions
- Sustainable, self-perpetuating, cost effective

(Wyckhus et al. 2022; Wyckhus et al. 2020)

Invasive insect impacts

- Insect pests damage ~ 35Mha of forests, globally (CBD 2009, FRA 2010)
- Invasive pests an important cause of biodiversity loss (IPBES 2019, Low 2017)
- Invasion costs increased 702% from 1980-1999 (Turbelin et al. 2022)
- New insect invasions are estimated to increase by 35% worldwide (Bonnamour et al. 2023)

Economic value of ecosystem services provided by Insects

Pollination: Worldwide economic value of:

- ✓ pollination service ~ €153 billion (75% of the world’s major crops rely on bee pollination).
- ✓ Estimated annual crop value at stake due to pollinator loss: US\$ 235-577 billion
- ✓ Biological control: US\$ 417 billion.

Insect farming: For food and feed

- ✓ Is estimated to be worth US\$2.6 billion
- ✓ Biofertilizer through waste recycling by insects: US\$19.4 billion

Role of soil biota including (nutrient cycling, decomposition of organic matter, carbon sequestration, soil structure, water flow, soil erosion):

- ✓ Estimated to be worth US\$1.5 trillion.

Losey & Vaughn, 2006; Naranjo et al., 2014; Verner et al. 2021

Solutions & best practices and pollution

Threat/Driver/Problem	Solution
Pesticides and pollution – Ag practices That kill, reduce foraging and nesting opportunities	Transformation of industrial agriculture toward agroecology - IPM and organic practices that reduce use of synthetic pesticides and herbicides. Avoid unguided pesticide application and over-use of industrial fertilizers, replace with alternatives as biopesticides and semio-chemicals.
Invasive species – displaces and negatively impact	Removal, re-planting of native species, employ classical biological control approaches; quarantine restrictions
Habitat loss and degradation – decline in habitat due to ag intensification	Identifying and promoting climate refugia - hedgerows, woodlots, sown vegetation, and flower strips represent microclimatic refuges for agrobiodiversity. Agri-environment schemes incentivize habitat improvement; insect friendly gardening.
Climate change – insects responding to shifting climate	Diverse measures - Road verges, public green spaces, local gardens form important habitats and refugia, protect and preserve natural areas; enabling policies, broad awareness-raising, and stakeholder education. existing natural areas need to be strictly preserved.