AGROECOLOGY
AS A CLIMATE SOLUTION

Why agroecology and pesticides reforms should underpin action on agriculture and food systems in support of the Paris Agreement

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KEY MESSAGES

01 **Agriculture and food systems are now on the UNFCCC agenda, but the response is not yet commensurate with the scale of the problem.** At 64th Sessions of the United Nations Framework Convention on Climate Change (UNFCCC) Subsidiary Bodies (SB64) (Bonn, 8–18 June 2026), Parties moved the Sharm el-Sheikh Joint Work on Agriculture and Food Security (SJWA) towards implementation. Yet the final SJWA text did not mention agroecology,[1] and there was no substantive discussion of reducing pesticides or phasing out Highly Hazardous Pesticides (HHPs).

02 **Agroecology is a proven mitigation and adaptation pathway.** The IPCC reports that agroecological farming – which helps reduce reliance on and risks and impacts from pesticides - could cut emissions by 2.8 - 4.1 GtCO2e per year while maintaining productive and equitable food systems underpinning adaptation.[2] This is equivalent to between 6.8% and 10% of global energy related CO2e emissions in 2021.[3]

03 **Pesticides carry a climate footprint that is rarely counted.** They are made from petrochemicals, emit greenhouse gases through production, distribution and application, and degrade the soil life that stores carbon.[4]

04 **Without a clear, rights-based direction, "climate action in agriculture" risks funding business as usual.** Precision and digital agriculture, carbon markets and offsets can entrench the monocultures, chemical inputs and corporate control that make food systems vulnerable.[6]

05 **Finance must reach those who can deliver.** Public, grant-based climate finance must reach small-scale food producers and community-led agroecological transitions.[7]

1. UNFCCC COP31: Where We Stand & Lessons From SB64

SB64 took place as climate disasters, biodiversity loss, land degradation, food insecurity and rural poverty worsened across regions. Parties agreed their agendas quickly, but early progress faded into stalemate, with few concrete results after two weeks of talks. Three outcomes are of relevance for COP31 and the food systems agenda:

1. **Recognition without direction.** More Parties recognised food systems as central to climate action, and SJWA discussions began to connect food production, biodiversity, ecosystems, livelihoods and resilience. But the shift in conversation was not backed by political commitment and agroecology was absent from the final SJWA document.
2. **Silence on pesticides.** Official events and workshop agendas contained no focus on reducing pesticide use or phasing out HHPs, despite the evidence linking pesticide-intensive agriculture to emissions, biodiversity loss and health harms.
3. **Finance deadlock.** Negotiations on the Global Goal on Adaptation (GGA) ended without consensus, after developed countries did not agree to include in the text the tripling of adaptation finance promised at COP30 in Belém. The GGA text must now be restarted at COP31. UNFCCC Executive Secretary Simon Stiell, in his closing statement, explicitly reminded Parties that commitments made at the first Global Stocktake—"on Loss and Damage; on 300 billion; on 1.3 trillion; on tripling adaptation finance; and more"—are "the baselines" that cannot be renegotiated or backslid upon. He condemned the "you-first-ism" that had paralyzed negotiations.

SB64 showed that people are paying more attention to food systems in climate talks. But just being aware is not enough. Without a clear move toward people-led agroecology and climate justice, the world could end up keeping the same systems that caused the climate crisis in the first place.

The way ahead is clear. Science shows that agroecology should be at the heart of climate adaptation and mitigation, biodiversity restoration, and food security. HHPs must be phased out, as already being demanded by other international agreements, notably the GFC, which calls for the phase-out of HHPs in agriculture by 2035, where safer and affordable alternatives are available. Public climate finance needs to reach small-scale food producers and community-led projects. Farmers, Indigenous Peoples, women, fisherfolk, and rural communities must have a real say in decisions. Developed countries must meet their past promises and provide enough resources for a just transition.

2. Agroecology and Pesticide Reform for Coherent Climate Action

Agroecology: mitigation and adaptation together

Agroecology offers a powerful climate solution. This productive, ecologically resilient, economically robust and sustainable approach to agriculture emphasizes farming in harmony with natural cycles and processes, and integrates cutting edge science with local and Indigenous knowledge, innovation and practice. Grounded in principles of equity, collectivity and justice, agroecology upholds a commitment to the political approach and social values of food sovereignty. This proven approach to farming has enabled farmers around the world to

replace dependence on highly hazardous pesticides with healthy, productive and resilient food and farming systems that nourish their communities, ecosystems and the planet. Beyond the mitigation contributions of agroecology mentioned above, the IPCC also found that agroecological farming enhances adaptation to climate change, including resilience to extreme events, and that adopting agroecological principles and practices will be highly beneficial to maintaining healthy, productive food systems under climate change.[8]

The climate & human costs of pesticides

- **Production:** 99% of synthetic chemicals, including pesticides, are derived from petrochemicals.[9] Most pesticide active ingredients generate roughly 11.9 to 29.2 kg CO2e per kg produced, and some generate over 40 kg.[10]
- **Whole life cycle:** one study estimated that global pesticide production, distribution and application generated 73.2 MtCO2e, equivalent to 3.1% (range 1.0–5.8%) of global cropland emissions. This does not include emissions[11] associated with disposal or packaging.
- **Soils:** pesticides harm soil microorganisms that regulate carbon and nitrogen cycles. Studies indicate that optimising soil carbon storage depends on reducing pesticides, and some commonly used pesticides have been shown to substantially increase soil nitrous oxide emissions.[12]
- **Air:** pesticide applications emit volatile organic compounds that contribute to ground-level ozone, a significant greenhouse gas that also damages plants.[13,14]
- **Adaptation:** Soil organic matter is important for climate adaptation, too. Healthier soils grow healthier crops and retain more water, thereby reducing the impact of droughts and floods.
- **Human health:** a recent study published in Frontiers in Public Health, established that over 400 million of the world's farmers and farmworkers suffer from (non-fatal unintentional) acute pesticide poisoning each year, with 11 000 of these poisonings resulting in fatalities every year.[15]

Evidence from farmers that agroecology is part of the solution

PAN's Agroecology is a Climate Solution! case study series, from Argentina, Benin, Burkina Faso, Costa Rica, Ethiopia, India and Kenya, shows what this looks like in practice:

- **Ethiopia (Lake Ziway):** after Farmer Field School training, many vegetable farmers significantly reduced their use of HHPs. Only 5.5% reported acute health incidents and 92% adopted at least one agroecological method.
- **Kenya:** over 15 years, community-led biointensive methods that many farmers first dismissed as "going backwards" transformed the agricultural landscape of central Kenya into vibrant, productive, biodiversified, healthy and nutritious farming systems.
- **India (Kerala):** since 2022, 26 women's farming groups (399 farmers) have been supported in their transition to agroecology, with benefits for climate adaptation, mitigation and gender equity.
- **Costa Rica:** the Los Sukias rice farm has operated at large scale without agrochemicals since 2012, showing that food can be produced sustainably, profitably and ethically.
- **Argentina:** three case studies show agroecological production in walnut, wheat-pasture-livestock and urban garden systems.

Farmers, Indigenous Peoples, women, and grassroots communities around the world already have real solutions. The problem is not a lack of options. The real question is whether governments will stand up to corporate power and support the changes needed for climate justice.

3. Policy Coherence: Capitalising on Complementary Commitments

Most Parties to the UNFCCC have already committed to relevant and specific agriculture-sector reforms in other related UN policy instruments, including:

the phase out of Highly Hazardous Pesticides (HHPs) in agriculture under Target A7 of the Global Framework on Chemicals (GFC);

an at least 50% reduction in risk to biodiversity from pesticides under Target 7 of the Global Biodiversity Framework (GBF); and

commitments to increase support for agroecology under GFC Target D5 and GBF Target 10.

The UN Environment Assembly (UNEA) has also explicitly encouraged member states to enhance implementation synergies across different multilateral environmental agreements[5] and other relevant environmental instruments, and to phase out HHPs in agriculture.

Most Parties to the UNFCCC have already committed to relevant agriculture-sector reforms in other UN instruments, such as the Global Biodiversity Framework and Global Framework on Chemicals (see Table 1).

Instrument	Commitment	Deadline
GBF Target 7	'Reduce pollution risks and the negative impact of pollution from all sources by 2030... including: (b) by reducing the overall risk from pesticides and highly hazardous chemicals by at least half, including through integrated pest management...' Reported via Indicator 7.2 (ATAT/PEC), adopted Feb 2025.	2030
GBF Target 10	'Ensure that areas under agriculture... are managed sustainably... through a substantial increase of the application of biodiversity friendly practices... such as agroecological and other innovative approaches'.	2030
GFC Target A7	'By 2035, stakeholders must have taken effective measures to phase out highly hazardous pesticides in agriculture where the risks have not been managed and safer, affordable alternatives are available'. The target also states that 'stakeholders must promote the transition to these alternatives and make them available'.	2035
GFC Target D5	'By 2030, Governments implement policies and programmes to increase support to safer and more sustainable agricultural practices, including agroecology, integrated pest management and the use of non-chemical alternatives, as appropriate.'	2030

Table 1. Synergies across pesticide and pest management-related targets in the Global Biodiversity Framework and Global Framework on Chemicals.

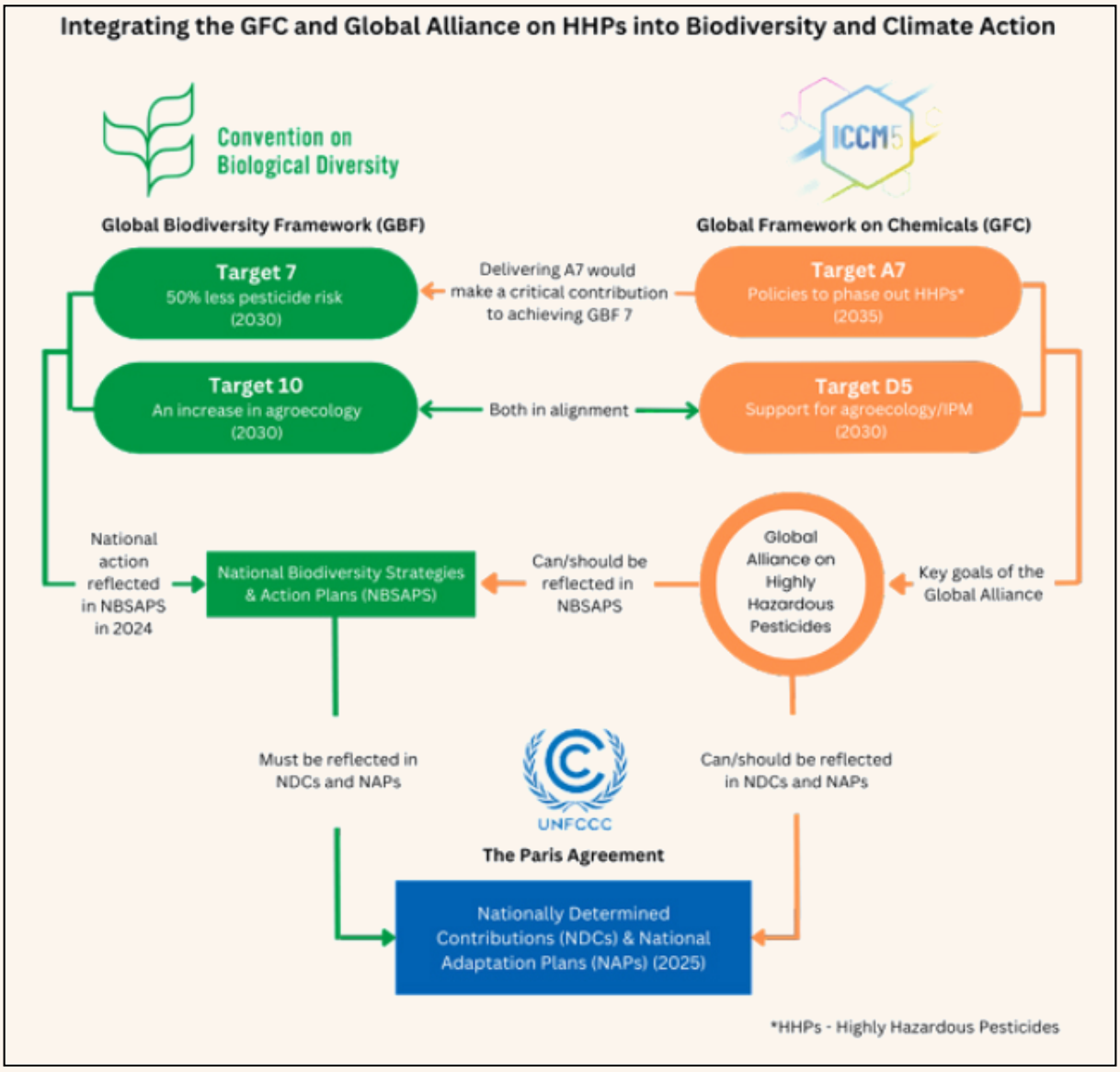


Figure 1: Synergies & complementarities on pesticides and agroecology across critical global Policy Frameworks

The UN Environment Assembly (UNEA-6) has called for greater synergies across multilateral environmental agreements (Resolution 6/4) and explicitly encouraged phasing out HHPs in agriculture in line with GFC Target A7 (Resolution 6/11).

- **Phasing out HHPs would be the single most effective step towards attaining GBF Target 7 and GFC Target A7.**

The Global Alliance on HHPs, agreed at the fifth International Conference on Chemicals Management, offers a ready vehicle for governments and companies to deliver.

Additionally, in the COP28 UAE Declaration on Sustainable Agriculture, Resilient Food Systems, and Climate Action,[16] 160 Parties committed to integrate agriculture and food systems into their climate and biodiversity plans. Delivering this credibly means reflecting agroecology and pesticide reform in those plans (Figure 1).

4. Policy Recommendations for COP31

A. Make agroecology and pesticide reform part of the SJWA outcome

1. Include explicit reference to agroecology, defined in line with its rights-based principles, in SJWA decisions and in the implementation work that follows.
2. Recognise pesticide reduction, agroecology and the phase-out of HHPs as part of climate-resilient agriculture, in line with GFC Target A7, Target D5 and UNEA Resolution 6/11.
3. Invite the FAO's Scaling up Agroecology Initiative to contribute to implementation of SJWA outcomes.

B. Reflect these commitments in national climate plans and reporting

4. Encourage Parties to integrate in their NDCs, National Adaptation Plans and long-term strategies measures to scale up agroecology (GFC D5, GBF 10), reduce pesticide risk (GBF 7) and phase out HHPs (GFC A7), supported by whole-of-government approaches.
5. Request that national reporting and inventories take account of the emissions from pesticide production and use, and the soil carbon effects of pesticides, so that reductions are visible and rewarded.
6. Align climate plans with NBSAPs and with chemicals and biodiversity commitments, in line with the UNEA call for synergies across the UNFCCC, GBF and GFC.

C. Deliver finance that reaches farmers and communities

7. Restore momentum on adaptation finance by writing the tripling of adaptation finance, promised at COP30, into the GGA outcome.
8. Direct new, additional, public and grant-based finance to small-scale food producers, women, youth and Indigenous Peoples, with simplified access for community-led agroecological transitions.
9. Ensure adequate and meaningful public sector support for agroecological transformation and adaptation, so that farmers and communities are not dependent on market mechanisms or private investment alone.

D. Build an enabling environment for national transitions

Drawing on the recommendations in PAN's case-studies collection, national governments should:

10. Establish dedicated public budget lines and transition support for farmers moving from chemical-intensive to ecological farming, and develop national agroecology action plans across ministries.
11. Adopt public procurement policies favouring agroecological products for schools, hospitals and other public institutions, and support short value chains and participatory guarantee systems.
12. Reorient extension services and research towards farmer field schools and farmer-led participatory research, and protect farmer-managed seed systems and land and water rights.

E. Make the Just Transition Mechanism work for rural communities

13. Ensure the Just Transition Mechanism addresses land rights, resource control, labour rights, gender justice, corporate power and the livelihoods of small-scale food producers, and includes local governments and food producers in its design and governance.

PAN urges Parties to approach COP31 as a genuine opportunity to identify and overcome the barriers to implementation and hold one another accountable to the commitments made at COP28 in the UAE Declaration on Sustainable Agriculture, Resilient Food Systems and Climate Action. Parties must also build on the political momentum emerging from COP30, as well as the ongoing work in other international multilateral environmental agreements, such as the GFC, the Global Alliance on HHPs and the GBF, to take immediate action to transform food and agriculture systems, in order to stave off the worst consequences of overshooting 1.5°C in global temperature, as is expected to occur within this decade. off the worst consequences of overshooting 1.5°C in global temperature, as is expected to occur within this decade.[17]

5. Conclusion

Recent international commitments to integrate agriculture and food system transformation into targeted national climate action under the UNFCCC and Paris Agreement are welcome and urgently needed.

The COP28 UAE Declaration on Sustainable Agriculture, Resilient Food Systems, and Climate Action establishes clear obligations and timelines for at least 160 countries to detail their plans in NBSAPs under the CBD, and NDCs and NAPs under the Paris agreement, during 2024 and 2025. The Baku Harmoniya Climate Initiative for Farmers, stemming from COP29 in Azerbaijan, must reinforce and catalyse implementation of the Declaration, and help countries and farmers to transition.

These initiatives, and national plans to align corporate practices and finance flows with the goals of the Paris Agreement and the Global Biodiversity Framework, should harness the potential and reach of the participants of the COP28 Action Agenda on Regenerative Landscapes. In doing so, all UNFCCC stakeholders should harness efficiencies presented by complementary commitments across UN policy frameworks, including the GFC – in line with UNEA resolutions, including on the Bern Process, the GFC, and HHPs.

Agriculture and food system reforms integrated into NDCs and NAPs, and into corporate policies, must:

- **Prioritize support to scale up agroecological farming systems, in line with GFC Target D5 and GBF Target 10;**
- **Prioritize the phase out of Highly Hazardous Pesticides (HHPs), in line with GFC Target A7; and**
- **Set ambitious pesticide risk reduction targets in line with GBF Target 7, that build on the above two actions.**

These actions will help deliver key global commitments on agriculture and food systems common to the three UN policy frameworks and address the triple planetary crisis of climate change, biodiversity loss, and pollution, while reducing the national burden of delivery.

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Pesticide Action Network International (PAN) is a global coalition of over 600 participating non-governmental organizations, institutions and individuals in 90 countries, working to replace hazardous pesticides with ecologically sound and socially just alternatives. Founded in 1982, PAN works to end reliance on hazardous pesticides and achieve health, resilience and justice in food and farming. PAN advocates for agroecology as a powerful solution to the negative effects of chemical intensive agriculture and the converging planetary and societal crises of climate chaos, biodiversity loss, pollution and failing public health. PAN situates its work within a rights-based approach that prioritizes agroecology, food sovereignty and climate justice.

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