



DEFEND-BIO LEGAL CLINIC SUBMISSION on Agri-business, food security and human rights to the UN Working Group on Business and Human Rights



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This submission for the UN Working group on Business and Human Rights was prepared by members of the Transnational Legal Clinic Defending a Living Earth (DEFEND-BIO legal clinic) hosted at the Raoul Wallenberg Institute of Human Rights and Humanitarian Law (RWI) and the Department of Sociology of Law at Lund University.¹ RWI is an independent academic institution that combines multi-disciplinary human rights research with education, support and outreach to contribute to a wider understanding of, and respect for, human rights and international humanitarian law. Currently, we have offices in Lund, Addis Ababa, Bangkok, Harare, Jakarta, Nairobi, Phnom Penh, and Yerevan. This Submission showcases challenges, lessons learned and recommendations on the role of judicial and non-judicial instances regarding business-related human rights in the context of food systems.²

Authors of this submission are: Dr. Claudia Ituarte-Lima (coordinating author) Paola Cortés, Drishti Alagh, Dr. Maria Andrea Nardi, Aline Fulgencio

Our main recommendations are: (a) integrate pollinator and pesticide impacts into mandatory human-rights due diligence acknowledging that safeguarding pollinators and healthy ecosystems, and preventing pesticide-related harms are essential components of human-rights-based food systems; (b) regulate pesticides guided by the precautionary principle and restrict or prohibit substances that pose risks to pollinators, biodiversity, and human health before the harm has occurred; (c) hold agribusinesses accountable for human rights and ecological harms caused by their products or practices, and ensure access to remedies for communities affected by them, including compensation and ecological restoration; (d) promote systemic transformation of food systems through public investment, policy coherence, and incentives for agroecology and integrated pest management prioritizing the public interest of present and future generations.

¹ More information about the Defendbio legal clinic can be found here: <https://rwi.lu.se/transnational-law-clinic-defending-a-living-earth-defend-bio-legal-clinic/>

² We focus on question 16 as specified in the call for inputs at <https://www.ohchr.org/en/calls-for-input/2025/call-input-report-agri-business-food-security-and-human-rights>

In this submission, we show the role of pollinators in sustainable food production, food security, and human rights, and the negative impact of agribusiness commercialized pesticides on pollinators and on a wide range of human rights. We identify the role of judicial and non-judicial mechanisms in preventing these pesticides' impacts as well as on access to justice, including remedy. Ultimately, we argue that preventing business-related human-rights abuses in the food sector requires more than regulatory oversight and judicial intervention; it requires support for a transition toward alternative approaches -such as biological control, agroecological practices, and integrated pest management- that would reduce reliance on synthetic chemicals while maintaining crop productivity. Reparations of human rights abuses in the food sector should aim at a systemic transformation of food systems, agricultural production, and associated value chains.

1. POLLINATORS UNDERPINNING FOOD SYSTEMS: WHY THEY MATTER FOR HUMAN RIGHTS

Pollinators are essential for numerous food crops, especially fruits, vegetables, nuts, oil seeds, and legumes. The 2016 IPBES assessment concludes that 75% of our food crops and nearly 90% of wild flowering plants depend at least to some extent on animal pollination and pollinators.³ Declines in wild and managed bees therefore reduce yields and crop quality, narrowing dietary diversity and threatening nutrient-rich foods. A significant cause of these pollinator declines are commercial pesticides such as neonicotinoids and glyphosate. The health of humans, and the wider environment are closely linked and interdependent, this is the reason why organizations like WHO recognize the value of the One Health integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems.⁴

While there is widespread agreement that commercial pesticides currently play a crucial role in modern food production systems, they have also raised serious human rights and environmental concerns.⁵ The Green Revolution developed a technological package intended to enhance agricultural productivity, prioritizing the adoption of commercial inputs such as synthetic fertilizers and chemical pesticides.⁶ Advocates argue that in their absence, farmers would face pests or weeds, infestations and plant pathogens, leading to food shortages and rising prices, thereby threatening food security. They also argue that commercial pesticides -

³ IPBES, *The assessment report on Pollinator, Pollination and Food Production. Summary for Policy Makers* (2016) Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), Bonn. https://files.ipbes.net/ipbes-web-prod-public-files/spm_deliverable_3a_pollination_20170222.pdf

⁴ Read more on One Health at https://www.who.int/health-topics/one-health#tab=tab_1

⁵ Olivier De Schutter, *Report of the Special Rapporteur on the right to food. Final report: The transformative potential of the right to food* (2010). (A/HRC/25/57)

⁶ Brian S. Williams, *Pesticides and Sustainability, Pathways to Research Sustainability* (2023) EBSCO. <https://about.ebsco.com/sites/default/files/acquiadam-assets/Pathways-to-Research-Sustainability-Sample-Pesticides.pdf>

typically inorganic- facilitate consistent and efficient crop growth, ensuring a stable food supply for an expanding global population.⁷

However, scientific and policy evidence shows that pesticides can be a risk and threat to human and environmental health.⁸ Moreover, their sustainability has not been proven. In the first place, since chemical pesticides are not accessible to all farmers, many rely on subsidies or credit to purchase them, increasing risks associated with market dependence.⁹ In the second place, certain commercialized pesticides have a significant impact on the environment and other-than-humans, including pollinators, such as those neonicotinoids' pesticides and glyphosate herbicide which have been proven to harm bees. The 2019 FAO report on the state of the world biodiversity for food and agriculture highlights the link between biodiversity loss, pollinator decline and food insecurity. Smallholders, Indigenous peoples, women farmers and low-income rural communities experience disproportionate impacts of ecosystems' degradation and negative impacts to pollinators.¹⁰

The European Food Safety Authority's 2018 risk assessments concluded that key neonicotinoids - including clothianidin, imidacloprid, thiamethoxam - pose significant risks to honeybees and wild bees.¹¹ Glyphosate is further shown to affect pollinators' health by disrupting honeybee gut microbiota, thereby increasing susceptibility to pathogens and impairing behavior.¹² Further studies conducted on the impacts of glyphosate on pollinator health confirm related immune and cognitive effects with implications for colony health.¹³ Moreover, the interaction between pesticides, habitat loss, parasites, and nutritional stress of pollinators magnifies harm beyond a single-chemical exposure.¹⁴ Pollinators' exposure to neonicotinoids is known to reduce learning, impact colonial stability and adversely affect foraging, navigation, reproduction and their homing abilities.¹⁵

⁷ Marty Matlock, *Listen: How Pesticides Help Advance Sustainable Agriculture* (2024) Division of Agriculture, Research and Extension, University of Arkansas, <https://aaes.uada.edu/podcast/how-pesticides-help-advance-sustainable-agriculture/>

⁸ UNEP-FAO-WHO, *Environmental and Health Impacts of Pesticides and Fertilizers and Ways to Minimize Them*, (2022). Wei Zhou, Mengmeng Li, Varennyam Achal, 'A comprehensive review on environmental and human health impacts of chemical pesticide usage', *Emerging Contaminants* (2025) 11(1): 100410, , <https://doi.org/10.1016/j.emcon.2024.100410>

⁹ Brian S. Williams, *Pesticides and Sustainability, Pathways to Research Sustainability*, (2023) EBSCO. <https://about.ebsco.com/sites/default/files/acquiadam-assets/Pathways-to-Research-Sustainability-Sample-Pesticides.pdf>

¹⁰ J. Bé-langer and D. Pilling (eds.), *The State of the World's Biodiversity for Food and Agriculture* (2019) Food and Agriculture Organization of the United Nations (FAO) Commission on Genetic Resources for Food and Agriculture Assessments, Rome.

¹¹ EFSA, 'Clothianidin: peer review of pesticide risk assessment for bees' (2018) 16(2) *European Food Safety Authority Journal* 5177. See also, EFSA, 'Imidacloprid: peer review of pesticide risk assessment for bees' (2018) 16(2) *EFSA Journal* 5178 and EFSA, 'Thiamethoxam: peer review of pesticide risk assessment for bees' (2018) 16(2) *EFSA Journal* 5179.

¹² Erick VS Motta, Kasie Raymann and Nancy A Moran, 'Glyphosate perturbs the gut microbiota of honey bees' (2018) 115 *PNAS* 10305.

¹³ Balbuena MS, Tison L, Hahn M-L, Greggers U, Menzel R and Farina WM, 'Effects of sublethal doses of glyphosate on honeybee navigation' (2015) 218 *Journal of Experimental Biology* 2799.

¹⁴ Supra at Note 1.

¹⁵ Dave Goulson, 'An overview of the environmental risks posed by neonicotinoid insecticides' (2013) 50 *Journal of Applied Ecology* 977.

While neonicotinoid insecticides (neonics) and glyphosate have long been linked to massive loss in bee and butterfly populations as well as to ecological harms, scientific studies also tie neonics to declining bird species, significant losses of fish populations, and birth defects in white-tailed deer.¹⁶ The impacts of these insecticides are farther reaching than this with studies indicating potential human health risks associated with pesticides. The International Agency for Research on Cancer has been labelled glyphosate as “probable carcinogen”.¹⁷ Certain studies on neonicotinoids have raised concerns on possible risks including prenatal developmental effects, autism-like neurobehavioral symptoms, and congenital heart and brain defects.¹⁸ Evidence of such risks thereby reinforces the applicability of the precautionary principle in regulating pesticides: even when certain cumulative ecological and human-health impacts remain uncertain, they are potentially severe especially to people in vulnerable situations such as children and pregnant women.

The 2022 FAO-UNEP-WHO report on the environmental and health impacts of pesticides and fertilizers calls for a profound overhaul of how these inputs are produced, used and managed, emphasizing ecosystem-based crop management, circularity, life-cycle approaches, improved economic incentives for sustainable products, and strengthened standards for environmentally and socially responsible supply chains.¹⁹ Importantly, the report stresses that this transformation must involve all actors in the agri-food system -farmers, input suppliers, companies, researchers, consumers and policymakers, reflecting the shared responsibility for food systems that protect biodiversity and human well-being.

2. JUDICIAL & NON-JUDICIAL MECHANISMS RELEVANT FOR PREVENTING HUMAN RIGHTS ABUSES IN THE FOOD SECTOR

2.1 Judicial mechanisms

While much more needs to be done, certain judicial mechanisms have been used to prevent further harm to pollinators by business products. Since there is no global international human rights or environmental tribunal, the respective cases have taken place at regional and national levels. For example, in *Bayer CropScience AG and Bayer AG v EU Commission* (C-499/18 P), the Court of Justice of the European Union (CJEU) upheld the legality of restrictions imposed by the European Commission on certain neonicotinoids.²⁰ Applying the precautionary principle, the Court recognized that, where scientific uncertainty persists regarding serious risks to bees, regulatory action to limit such risks is justified. Thus, the judgment confirms that

¹⁶ Jennifer Sass, ‘Neonic Pesticides: Potential Risks to Brain and Sperm’, NRDC Expert Blog, 6 January (2021). <https://www.nrdc.org/bio/jennifer-sass/neonic-pesticides-potential-risks-brain-and-sperm>

¹⁷ WHO, IARC Monograph on Glyphosate, 2018, International Agency for Research on Cancer (IARC) <https://www.iarc.who.int/featured-news/media-centre-iarc-news-glyphosate/>

¹⁸ Samantha L Carmichael and others, ‘*Hypospadias and residential proximity to pesticide applications*’ (2014) 22 *Birth Defects Research Part A: Clinical and Molecular Teratology* 1. See also, Wen-Jun Yang and others, ‘*Gestational exposure to neonicotinoid insecticides and risk of neural tube defects*’ (2014) 131 *Environmental Sciences Europe* 1; Staci Keil and others, ‘*In vivo effects of neonicotinoid pesticide exposure on behavioural development in mice: a potential model for autism-like outcomes*’ (2014) 231 *Journal of Applied Toxicology* 1.

¹⁹ UNEP-FAO-WHO, 2022, identified gaps in relation to knowledge of the effects of pesticides on health and the environment. https://www.fao.org/fileadmin/user_upload/soils/publications/pesticides.pdf

²⁰ Case C-499/18 P *Bayer CropScience AG and Bayer AG v Commission* EU:C:2021:3.

safeguarding pollinators is a legitimate and necessary component of ensuring the proper functioning of agricultural markets, given their role in supporting crop production. The European Commission actions in this case are aligned with the principles of precaution and other principles embedded in Article 37 of the EU Charter of Fundamental Rights (CFR) specifying the obligation of the EU to integrate in its policies a high level of environmental protection and the improvement of the quality of the environment.

In contrast to the above-mentioned case, the EU Commission re-approved glyphosate for 10 years - i.e. until 2033^[10]. In response to this, on December 2024, PAN Europe and the five NGOs filed a lawsuit (Case T-639/24) before the European Court.^[11] PAN and others argued that European Commission, the European Food Safety Authority (EFSA) and the European Chemicals Agency (ECHA) have not adhered to the EU law and case law on pesticide regulation and the precautionary principle and thereby have failed to implement their obligation to protect European citizen's health and the environment.^[12] PAN and others argue that glyphosate risks compromising the brain and nervous system and causing cancer-among other risks- have not been properly assessed. No judgement has yet been delivered by the European Court.

Judgements by courts help delineate State duties and business responsibilities contextualized to the food sector. In *Pollinator Stewardship Council v EPA*, the Ninth Circuit set aside the Environmental Protection Agency's approval of the pesticide sulfoxaflor because the agency lacked adequate data on its effects on bees. On page 4 of Judge Schroeder's opinion, the Court states: "Bees are essential to pollinate important crops and in recent years have been dying at alarming rates."²¹ The concurring opinion further emphasizes that the agency failed to comply with its own scientific standards before granting approval.²² The EU and US case law therefore converge in recognizing that protecting pollinators is a matter of legal necessity for sustaining food production. Both systems treat inadequate evaluation of pesticide impacts on bees not only as a regulatory failure but as a threat to the integrity of the agrifood sector.

In the case of *Pollinator Stewardship Council v. EPA*, the U.S. The Ninth Circuit Court of Appeals vacated the EPA's approval of sulfoxaflor, finding the agency had failed to adequately assess risks to bees.²³ This case, therefore, demonstrated the role of judicial review in ensuring that agencies, corporations and regulators evaluate pollinator impacts as an indirect safeguard for food systems.²⁴²⁵

Business-related environmental harm in the food production chain can translate into human rights impacts requiring judicial intervention in national courts. A relevant illustration from

²¹ *Pollinator Stewardship Council v US Environmental Protection Agency* 806 F.3d 520, 523 (9th Cir 2015) (Opinion of Judge Schroeder). https://cdn.ca9.uscourts.gov/datastore/opinions/2015/09/10/13-72346.pdf?utm_source=

²² *ibid* (Concurrence of Judge N.R. Smith)

²³ *Pollinator Stewardship Council v EPA* 806 F.3d 520 (9th Cir 2015).

²⁵ *Hardeman v Monsanto Co* (N.D. Cal 2020). See also, *Johnson v Monsanto Co* (Cal Superior Court 2018) and *Pilliod v Monsanto Co* (Cal Superior Court 2019).

Mexico involves the long-running legal actions²⁶ brought by Indigenous Maya beekeeping²⁷ communities in the Yucatán Peninsula against Monsanto (now Bayer) after the government authorized the large-scale cultivation of genetically modified soybeans.²⁸ The permits, granted without prior consultation, enabled intensive use of glyphosate and the expansion of industrial monocultures near Indigenous territories. Maya beekeepers reported contamination of water sources,²⁹ degradation of surrounding ecosystems, and the presence of genetically modified pollen in their honey,³⁰ directly threatening their livelihoods, cultural practices, and access to international markets. Beginning in 2012, several amparo lawsuits were filed before Mexican courts, ultimately reaching the Supreme Court acknowledged that the State had failed to conduct free, prior, and informed consultation.³¹ Although this ruling led to the suspension of permits,³² the case exposed persistent deficiencies in regulatory oversight, continued unauthorized planting, and the broader vulnerability of pollinator-dependent food systems to agribusiness practices. Beyond courts in Mexico, also other countries have relevant jurisprudence e.g. a Colombian court ruling in Cartagena ordered the state to protect bees, recognizing their ecological importance.³³

While the court cases above refer to the use of the law to prevent socio-ecological damage, there is evidence of the law being used by businesses to obstruct the implementation of measures by the State to safeguard food-related human rights. The case of Mexico v. Monsanto responds to Mexico introducing measures to phase out glyphosate and restrict GM maize imports to protect biodiversity, health and food sovereignty.³⁴ In response to which,

²⁶ Torres-Mazuera G and Ramírez-Espinosa N, 'How a Legal Fight Against Monsanto Became an Indigenous Self-determination Claim in Mexico' (2022) 14 *Journal of Human Rights Practice* 223–242 <https://doi.org/10.1093/jhuman/huab033> accessed 19 November 2025.

²⁷ (Mexico, 2019 dir Adriana Otero & Robin Canul) <https://www.abejascine.com/que-les-paso-a-las-abejas> accessed 19 November 2025.

²⁸ USDA Foreign Agricultural Service, *Genetically-Enhanced Soybeans Approved for Commercial Use — Mexico* (GAIN Report MX2035, 8 June 2012) <https://apps.fas.usda.gov/newgainapi/api/report/downloadreportbyfilename?filename=Genetically-Enhanced%20Soybeans%20Approved%20for%20Commercial%20Use%20Mexico%20Mexico%206-8-2012.pdf>

²⁹ Jaime Rendón-von Osten and Ricardo Dzul-Caamal, 'Glyphosate Residues in Groundwater, Drinking Water and Urine of Subsistence Farmers from Intensive Agriculture Localities: A Survey in Hopelchén, Campeche, Mexico' (2017) 14 *International Journal of Environmental Research and Public Health* 595 <https://doi.org/10.3390/ijerph14060595>

³⁰ S Suryanarayanan, 'Milpa-Melipona-Maya: Mayan Interspecies Alliances and the Politics of Indigenous Beekeeping in Mexico' (2020) *ACME: An International E-Journal for Critical Geographies* 19(3) 351–375 <https://acme-journal.org/index.php/acme/article/view/1746> accessed 19 November 2025.

³¹ Suprema Corte de Justicia de la Nación, *Detalle de publicación, Asunto ID 203923* <https://www2.scjn.gob.mx/ConsultaTematica/PaginasPub/DetallePub.aspx?AsuntoID=203923> accessed 19 November 2025.

³² Suprema Corte de Justicia de la Nación (Segunda Sala), "Apicultores mayas logran suspender el cultivo de soya transgénica" (Amparo en revisión 241/2015) (9 Feb 2017) https://www.scjn.gob.mx/sites/default/files/sinopsis_asuntos_destacados/documento/2017-02/2S-041115-JFFGS-0241.pdf accessed 19 November 2025.

³³ Joaquín Augusto Torres Nieves v Ministerio de Agricultura y Desarrollo Rural & Ors (Tutela No 13001-31-04-001-2018-00077-00, Juzgado Primero Penal del Circuito de Cartagena, Colombia, 26 November 2018). https://ecojurisprudence.org/wp-content/uploads/2022/02/Colombia_Court-decision-protecting-bees-in-Colombia_370.pdf

³⁴ SEMARNAT, Decreto para la sustitución gradual del glifosato (31 December 2020).

Monsanto/Bayer and allied industry groups filed legal challenges against these restrictions before the Mexican administrative courts.

2.2. Non-judicial mechanisms

As part of UN Human Rights Special Procedures, Special Rapporteurs are independent experts with mandates to report and advise on human rights from a thematic or country-specific perspective, including on the food-biodiversity interface.³⁵ Already in 2010, the UN Special Rapporteur on the right to food (A/HRC/16/49) highlighted agroecology as a highly productive, sustainable mode of agricultural development that is strongly aligned with the realization of the right to food. Agroecology delivers tangible benefits for vulnerable groups, enhances resilience, reduces dependence on harmful inputs, and contributes to broader economic development. Scaling-up agroecological systems requires targeted public policies: investment in public goods rather than input subsidies; reinvestment in agricultural research and extension services; support for farmer-led innovation networks and field schools; gender empowerment; and the creation of enabling macro-economic conditions, including fair market access for sustainable producers. These measures are not only environmentally sound; they are human rights obligations.

Non-judicial grievance mechanisms, such as the OECD National Contact Points (NCPs) have been used in the context of human rights and environmental harms linked to agribusiness operations. For example, in 2024, several organizations from Argentina, Bolivia, Brazil and Paraguay documented how Bayer's genetically modified soybean seeds and glyphosate-based pesticides contributed to violations of the rights to health, food, land, and a clean, healthy and sustainable environment in rural and Indigenous communities. The complaint argues that Bayer failed to conduct adequate human rights and environmental due diligence, did not prevent or mitigate known harms, and has not provided remedy, amounting to breaches of the OECD Guidelines for Multinational Enterprises. Although NCP outcomes are not legally binding, the mechanism plays a crucial role in clarifying expected corporate conduct, enabling mediated dialogue, and generating public recommendations that can exert meaningful pressure on agribusiness actors. This example demonstrates the relevance of OECD NCPs as accountability tools in the agricultural sector, particularly where domestic remedies are ineffective or unavailable.³⁶

Another example of a non-judicial mechanism is the International Monsanto Tribunal -a civil-society initiative (2016-2017) wherein a panel of experts assessed Monsanto's conduct in light of international human rights and environmental law- which found that Monsanto's practices

³⁵ Koh NS, Ituarte-Lima C, Hahn T. Mind the Compliance Gap: How Insights from International Human Rights Mechanisms Can Help to Implement the Convention on Biological Diversity. *Transnational Environmental Law*. 2022;11(1):39-67.

³⁶ European Center for Constitutional and Human Rights (ECCHR) and others, *Impactos de las semillas de soja modificada genéticamente y los pesticidas a base de glifosato de Bayer AG sobre los derechos humanos y el medio ambiente en Argentina, Bolivia, Brasil y Paraguay: Instancia Específica presentada ante el Punto Nacional de Contacto alemán para las Líneas Directrices de la OCDE para Empresas Multinacionales* (25 April 2024).

had negatively affected the rights to food, health, environment and scientific freedom.³⁷ Though not binding, it established a normative record linking agrochemical business practices to human rights harms.

5. CONCLUSION AND RECOMMENDATIONS

The evidence and cases presented above demonstrate that the protection of pollinators is inseparable from the protection of human rights, including the rights to food, health, a clean, healthy and sustainable environment, and an adequate standard of living. States therefore have clear obligations under international human rights law to regulate pesticides, ensure precautionary and science-based decision-making, prevent foreseeable harm caused by private actors, and secure access to effective remedies. Likewise, under the UN Guiding Principles on Business and Human Rights, companies across the agri-food chain (including pesticide manufacturers and distributors) have a responsibility to avoid infringing on human rights and to identify, prevent, mitigate and account for adverse environmental and social impacts associated with their products and operations.

Ultimately, protecting pollinators is not a peripheral environmental issue; it is a foundational condition for sustainable food systems and the realization of human rights. Ensuring that business activities do not contribute to ecological degradation or food insecurity is therefore indispensable for States and companies committed to building resilient, equitable and rights-respecting agri-food systems.

Taken together, these findings indicate that safeguarding pollinators, ensuring healthy ecosystems, and preventing pesticide-related harms are essential components of human-rights-based food systems, underpinning the rights to food, health, a clean and sustainable environment, and an adequate standard of living. States, as main human rights duty-bearers and regional international institutions such as the EU should:

(a) Integrate pollinator and pesticide impacts into mandatory human rights due diligence requiring that agribusinesses, pesticide manufacturers, and other actors in the food system integrate the impacts of pesticides on pollinators, ecosystems, and human health into their human-rights and environmental due diligence obligations with heightened due diligence obligations when pesticides have potential impacts in groups in vulnerable situations such as children. National Action Plans on Business and Human Rights should explicitly incorporate these obligations to ensure businesses prevent foreseeable harms and mitigate risks across agricultural supply chains.

(b) Regulate pesticides guided by the precautionary principle. States should strengthen regulatory frameworks for pesticide approval and use, ensuring substances that pose potential risks to pollinators, biodiversity, or human health are restricted or prohibited before the harm occurs, including consideration of sub-lethal, cumulative, and synergistic effects. Regulatory

³⁷ Monsanto Tribunal, *Advisory Opinion* (The Hague 2017).

oversight should prioritize scientific evidence and independent risk assessment, ensuring that precautionary measures are applied to safeguard both ecosystems and human rights even if the scientific evidence is not conclusive.

(c) Hold agribusinesses accountable and ensure access to justice including remedies.

States should establish and enforce mechanisms to hold agribusinesses legally accountable for human rights and ecological harms resulting from their products or practices. This includes ensuring that affected communities have access to justice including effective remedies, such as compensation for health, livelihood, or cultural losses, and ecological restoration of degraded environments by pesticides. Judicial and non-judicial grievance mechanisms should be accessible, impartial, and capable of delivering timely and meaningful redress, reinforcing accountability across the agri-food sector. Recognize emerging rights-of-nature approaches as complementary protections for pollinators, biodiversity and food systems.

(d) Promote systemic transformation of food systems. States should support a long-term transformation of food systems to reduce reliance on harmful synthetic pesticides and build resilient, rights-respecting agriculture. This requires **public investment** in agroecological research, extension services, farmer-led innovation, and sustainable market development. Policies should be coherent across agriculture, trade, environment, and public health sectors, and incentivize practices such as **agroecology and integrated pest management** that prioritize the public interest and the well-being of present and future generations.

Questions or comments regarding this submission, please contact: Dr. Claudia Ituarte-Lima at claudia.ituarte-lima@rwi.lu.se. Research for this article was conducted with funding from the Swedish Research Council for Sustainable Development (Formas) and Biodiversa+ under the Defendbio project, Biosphere Defenders Leveraging Legal and Governance Tools For Just Sustainability Transformation (2024-00900) and from Formas under the project, Environmental Human Rights Defenders (2022-697 01684).