NHSMUN

National High School Model United Nations

FAO **BACKGROUND GUIDE** | 53

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A Note on the NHSMUN Difference

Esteemed Faculty and Delegates,

Welcome to NHSMUN 2027! We are Armen Bagdassarian and Sabeeh Mirza, and we are elated to serve as this year's Secretaries-General. Thank you for choosing to attend NHSMUN, the world's largest and most diverse high school Model United Nations conference. As a space for collaboration, consensus, and compromise, NHSMUN strives to transform today's brightest thinkers, speakers, and collaborators into tomorrow's leaders. We believe that an emphasis on education through simulation is paramount to the Model UN experience.

Realism and Accuracy: Although a perfect simulation of the UN is never possible, we believe that one of the core educational responsibilities of MUN conferences is to educate students about how the UN System works. We strive to invite real UN, NGO, and field experts into each committee through our committee speakers program. Moreover, we arrange meetings between students and the actual UN Permanent Mission of the country they are representing. These exclusive resources are only available due to IMUNA's formal association with the United Nations Department of Global Communications and consultative status with the Economic and Social Council. No other conference goes so far to deeply immerse students into the UN System.

Educational Emphasis: At the heart of NHSMUN lies education and compromise. Part of what makes NHSMUN special is its diverse delegate base. As such, when NHSMUN distributes awards, we strongly de-emphasize their importance in comparison to the educational value of Model UN. In particular, our daises look for and promote constructive leadership and diplomacy that strive toward consensus, as real ambassadors do in the United Nations.

Research and a Dedicated Staff: Our staffers care deeply about delegates' experiences and what they take away from their time at NHSMUN. Our Directors spend over six months preparing Background Guides, in addition to Update Briefs written to reflect the rapidly changing nature of the topics to be discussed. Our staffers are trained rigorously to provide the best conference experience possible. Our daises provide thoughtful comments on submitted position papers. Our staff aims to tailor the committee experience to delegates' reflections and research, but also to facilitate an environment where all delegates' thoughts can be heard.

Empowering Participation: The UN relies on the voices of all of its member states to create resolutions. This is our philosophy at NHSMUN too. Our Rules of Procedure and our staff focus on making every voice in the committee heard, regardless of country assignment or skill level. Additionally, unlike many other conferences, we also emphasize delegate participation after the conference. Delegates spend countless hours researching topics critical to the UN and broader international sphere.

Delegates, it is our sincerest hope that your time at NHSMUN will be thought-provoking and stimulating. NHSMUN is an incredible time to learn, grow, and embrace new opportunities. We look forward to seeing you work both as students and global citizens at the conference.

Best,

Armen Bagdassarian
Secretary-General

Sabeeh Mirza
Secretary-General

Position Paper Requirements

Delegate research and preparation is a critical element of attending NHSMUN and enjoying the debate experience. We have provided this Background Guide to introduce the topics that will be discussed in your committee. We encourage and expect each of you to critically explore the selected topics and be able to identify and analyze their intricacies upon arrival to the conference.

The task of preparing for the conference can be challenging. To assist delegates, we have updated our **Beginner Delegate Guide** and **Advanced Delegate Guide**. These guides contain more detailed instructions on how to prepare a position paper and excellent sources that delegates can use for research. Use these resources to your advantage. They can help transform a sometimes overwhelming task into what it should be: an engaging, interesting, and rewarding experience.

To accurately represent a country, delegates must be able to articulate its policies. Accordingly, NHSMUN requires each delegation (the one or two delegates representing a country in a committee) to write a position paper for each topic on the committee's agenda. More information about how to write and format position papers can be found in the **Research Guide**. To summarize, position papers should be structured into three sections.

> **I: Topic Background –** This section should describe the history of the topic as it would be described by the delegate's country. Delegates do not need to give an exhaustive account of the topic, but rather focus on the details that are most important to the delegation's policy and proposed solutions.
>
> **II: Country Policy –** This section should discuss the delegation's policy regarding the topic. Each paper should state the policy in plain terms and include the relevant statements, statistics, and research that support the effectiveness of the policy. Comparisons with other global issues are also appropriate here.
>
> **III. Proposed Solutions –** This section should detail the delegation's proposed solutions to address the topic. Descriptions of each solution should be thorough. Each idea should clearly connect to the specific problem it aims to solve and identify potential obstacles to implementation and how they can be avoided. The solution should be a natural extension of the country's policy.

Each topic's position paper should be **no more than 10 pages long** double-spaced with standard margins and 12 point font size. This is a maximum; **3–5 pages per topic is often a suitable length**. The paper must be written from the perspective of your assigned country and should articulate the policies you will espouse at the conference.

Each delegation is responsible for submitting position papers on or before **February 26, 2027**. If a delegate wishes to receive detailed feedback from the committee's dais, their position paper must be submitted on or before **February 5, 2027**. The papers received by this earlier deadline will be reviewed by the committee dais and returned before February 26. Instructions on how to submit position papers will be shared directly with faculty advisors.

Submission instructions for position papers will be sent to faculty advisers via email. If delegations are unable to submit their position papers on time, please contact us at **nhsmun@imuna.org**.

Delegations that do not submit position papers will be ineligible for awards.

Committee History

The Food and Agriculture Organization of the United Nations (FAO) was founded on October 16, 1945, in Quebec City, Canada, in response to the urgent global need to address hunger and malnutrition.[1] It was established as a specialized technical agency, tasked with providing information and assistance to countries to improve all components of biodiversity such as agriculture, fisheries, forestry, and food production. It also seeks to achieve international agreement on policies for the sustainable use and conservation of genetic resources for food and agriculture, along with ensuring fair and equitable sharing of the benefits derived from their use.[2]

To meet the demands posed by major global trends in agricultural development and the challenges faced by member states, FAO has identified key priorities on which it is best placed to intervene, such as helping to eliminate hunger, food insecurity, and malnutrition; making agriculture more productive and sustainable; reducing rural poverty; ensuring inclusive and efficient agricultural and food systems; and protecting livelihoods from disasters. Furthermore, the FAO's ability to address these global challenges is strengthened by its nearly universal membership. This extensive representation enables the FAO to serve as a global platform for collaboration on pressing food and agricultural issues. With a technical and advisory focus, the FAO guides member states through evidence-based research and recommendations, distinguishing it from purely deliberative bodies.

Throughout its history, the FAO has collaborated with various international organizations, such as the World Health Organization (WHO) and the World Food Programme (WFP). These partnerships have been crucial in combating hunger and promoting nutritional security worldwide. Notable achievements include FAO's work with the International Fund for Agricultural Development (IFAD) in leading the United Nations Decade of Family Farming (2019–2028), which highlights the vital role family farmers play in ensuring food security, improving livelihoods, and sustainably managing natural resources. Family farming, which accounts for nearly 80 percent of the world's food production, is seen as a key driver in achieving the Sustainable Development Goals, particularly in rural areas, where it helps protect the environment and foster resilience.[3]

Despite its accomplishments, the FAO faces significant challenges in fulfilling its mission. Issues such as climate change, food insecurity in conflict zones, and the growing global population have complicated efforts to ensure food availability for all. These limitations are likely to influence the FAO's ability to address future topics and will require innovative solutions and stronger international cooperation. To achieve lasting impact, the FAO must focus on developing sustainable, long-term strategies that address immediate food security concerns and empower communities to adapt to changing circumstances and build resilience for the future.

Looking ahead, the FAO is committed to advancing the United Nations' Sustainable Development Goals (SDGs), particularly Goal 2: Zero Hunger. Its work in promoting sustainable agriculture, improving food systems, and reducing rural poverty will continue to be essential in the global effort to create a world free from hunger and malnutrition.[4]

1 "About FAO | FAO | Food and Agriculture Organization of the United Nations," AboutFAO, n.d., https://www.fao.org/about/about-fao/en/.
2 Food and Agriculture Organization of the United Nations. Biodiversity and Agriculture: A Contribution to the Global Biodiversity Assessment. Rome: FAO, 2020.
https://www.fao.org/fileadmin/templates/biodiversity_paia/PAR-FAO-book_lr.pdf.
3 Food and Agriculture Organization of the United Nations. "Family Farming." Accessed September 26, 2024. https://www.fao.org/reduce-rural-poverty/our-work/family-farming/en/.
4 Food and Agriculture Organization of the United Nations. "FAO Strategic Framework for Sustainable Development Goals." Accessed September 26, 2024, https://www.fao.org/about/strategy-programme-budget/strategic-framework/fao-sdg/en/.

TOPIC A

Protecting the World's Pollinators

FAO | NHSMUN 2027

Photo Credit: Anthony Colangelo, Pollinator Partnership

Introduction

Pollinators connect biodiversity, agriculture, food security, and human well-being in ways that often go unnoticed. From forests and grasslands to farms and home gardens, animal pollinators support the reproduction of countless flowering plants and contribute to the production of many of the foods people rely on every day. As concerns about pollinator declines have grown, so too has international recognition that conserving pollinators is essential to resilient ecosystems, sustainable agriculture, and food security.

Yet, pollinator conservation presents complex scientific and policy challenges. Protecting pollinators requires balancing biodiversity conservation with agricultural productivity, economic development, and the diverse environmental, cultural, and social circumstances of many different countries. Effective conservation also benefits from drawing upon multiple knowledge systems. These include scientific research as well as the long-term stewardship and place-based knowledge of Indigenous Peoples and local communities. These knowledge systems contribute valuable perspectives for understanding ecosystems, sustaining biodiversity, and developing locally appropriate conservation strategies.[1] While most nations recognize the importance of pollinators, they do not always agree on how conservation should be achieved. Together, these complexities make pollinator conservation a vitally important topic for international cooperation.

This guide introduces the science of pollination and the importance of pollinators, examines the major drivers of pollinator decline, explores current conservation efforts, and highlights the policy challenges facing the international community. As delegates will discover, pollinator conservation at regional, national, and international scales rarely involves simple answers. While many local conservation actions are well understood, coordinating conservation across different ecosystems, agricultural systems, governments, and cultures presents additional complex scientific and policy challenges.

History and Description of the Issue

POLLINATORS AND THEIR IMPORTANCE

Nearly every fruit, seed, and flowering plant begins with a remarkable biological process: **pollination**. Pollination occurs when pollen is transferred from the male reproductive structures of a flower, called the anthers, to the female reproductive structure, called the stigma, of the same or another flower of the same species. This transfer enables fertilization and the production of seeds and, in many plants, fruits. While some plants rely on wind or water to move pollen, approximately 87 percent of flowering plant species are pollinated by animals.[2] As animals forage for nectar or pollen, they transport pollen among flowers, benefiting both the plant by aiding reproduction and the pollinator, which obtains food resources.[3]

Bees are the most commonly recognized pollinator, but they are only one part of a much larger and more diverse community of animals that includes flies, butterflies, moths, beetles, wasps, birds, bats, and many other species that transfer pollen between flowers while foraging for floral resources.[4] Pollinators differ greatly in their biology, behavior, and the plants they visit. Different ecosystems around the world therefore support unique communities of pollinators adapted to local environmental conditions.

Pollination is essential not only for the reproduction of individual plants but also for the functioning of healthy ecosystems. When pollinators move pollen among flowers, they enable plants to produce seeds and fruits that provide food and habitat for countless other organisms. These interactions help sustain plant diversity, support wildlife populations, and contribute to the resilience of ecosystems as they respond to environmental change. Although the importance of individual pollinator species varies among ecosystems, pollination as a biological process plays a fundamental role in maintaining biodiversity worldwide.[5]

The benefits that people receive from healthy ecosystems are known as **ecosystem services**. Pollination is one of the most critical of these services because it supports both natural ecosystems and human societies. Animal pollination benefits approximately 75 percent of the world's leading food crop types, including many fruits, vegetables, nuts, seeds, and other crops.[6]

Perhaps the most familiar example is found at the dinner table: one out of every three bites of food consumed worldwide depends, at least in part, on animal pollination.[7] While staple grains such as wheat, rice, and maize are primarily pollinated by wind and provide much of the world's calories, many fruits, vegetables, nuts, legumes, spices, coffee, cocoa, and oilseed crops rely, to varying degrees, on animal pollinators.[8] As a result, pollinators contribute not only to agricultural production but also to dietary diversity, nutrition, and food security, since many pollinator-dependent crops are rich sources of essential vitamins, minerals, and healthy fats.[9]

Beyond food production, pollination supports plant species that contribute to medicines, fibers, cultural resources, and countless other ecosystem services that people rely upon. Healthy plant communities provide habitat for wildlife, stabilize soils, improve water quality, and contribute to recreation, tourism, and cultural practices. As the global population grows, maintaining healthy pollinator populations is becoming a vital challenge for balancing biodiversity conservation, agricultural productivity, and human well-being.[10]

Honey bees (*Apis mellifera*) are the pollinators most familiar to many people, but they represent only one species within a remarkably diverse community of pollinating animals. Scientists have identified more than 20,000 species of bees worldwide, yet only about a dozen species are commonly managed for agricultural pollination.[11] Most wild bee species are solitary, meaning they do not live in large colonies like honey bees. The colonial lifestyle and general foraging preferences of honey bees have made them easily managed by beekeepers, who maintain colonies for agricultural pollination and harvest products such as honey and beeswax.[12]

Managed honey bees provide valuable pollination services for many agricultural crops, while wild pollinators often complement these services by enhancing crop yield, stability, and resilience.[13] Collectively, managed and wild pollinators support productive agricultural systems, although their relative contributions vary among crops, regions, and landscapes.[14]

Animal pollination benefits approximately 75 percent of the world's leading food crop types.

At the same time, ecologists continue to study whether managed honey bees may compete with native pollinators for floral resources in some landscapes, particularly where floral resources are limited or sensitive wild bee populations are present. Current evidence suggests that these interactions are highly context-dependent and vary according to honey bee density, habitat quality, and the composition of local pollinator communities.[15] These findings reinforce the importance of maintaining abundant and diverse floral resources across landscapes.

Because pollinators differ in how and when they forage, diverse pollinator communities can provide more reliable and resilient pollination than a single species alone.[16] Conserving pollinator diversity therefore supports not only biodiversity but also resilient ecosystems and food systems capable of adapting to changing environmental conditions.[17]

Pollination systems vary widely across the natural world. Some flowering plants are visited by many different pollinator species, while others have evolved highly specialized relationships with only one or a few pollinators. These relationships are examples of **mutualism**, a biological interaction in which both species benefit: pollinators obtain food resources such as nectar or pollen, while plants receive the pollination needed for reproduction. Over millions of years, plants and their pollinators have **coevolved**, resulting in an extraordinary diversity of flowers, pollinators, and pollination systems. Floral characteristics such as shape, color, scent, flowering time, and nectar production can influence which pollinators visit a plant, helping explain why different pollinator communities occur in different ecosystems.[18]

Pollination systems are also shaped by geography, climate, and land use.[19] The pollinators that support coffee production in tropical forests, for example, differ from those that pollinate apple orchards, almond groves, or wildflowers in temperate grasslands. Understanding this diversity is imperative because there is no single approach to pollinator conservation. Successful strategies must consider the species present, the habitats they require, and the ecological and land use systems in which they occur.[20]

LAND-USE AND AGRICULTURAL PRESSURES

Around the world, many pollinator populations face multiple pressures that often occur simultaneously. Habitat loss, agricultural intensification, pesticide exposure, climate change, diseases, invasive species, pollution, and other stressors often occur together. Rather than acting independently, they can interact in additive or compounding ways, making it difficult to identify a single cause of pollinator decline. The type and severity of these pressures vary among species, ecosystems, and regions, but together they have contributed to growing concern about the future of pollinators and the essential ecosystem services they provide.[21] For example, pesticide exposure may compound the effects of poor nutrition, habitat loss, and climate-related stress, making combined impacts more difficult to predict than any single threat alone.[22]

Crucially, pollinators do not all respond to these pressures in the same way. A factor that poses a significant challenge for one species may have little effect on another, depending on its biology, habitat requirements, geographic range, and life history. Likewise, the primary drivers of pollinator decline vary among ecosystems and regions of the world. Understanding these biological and geographic differences is essential for developing conservation strategies that are adapted to local pollinator communities and environmental conditions.[23]

Pollinators depend on healthy habitats that provide food, nesting sites, and places to reproduce throughout their life cycles. Native flowering plants, which have evolved within a region, supply diverse sources of nectar and pollen that local pollinators have coevolved alongside. Diverse natural habitats, including forests, grasslands, wetlands, and areas of bare

ground or hollow plant stems, provide the nesting and overwintering sites many pollinators need to complete their life cycles.[24] As natural habitats are converted to agriculture, urban development, resource extraction, or other land uses, these essential resources become reduced or may disappear entirely.[25]

Habitat fragmentation can further divide remaining habitat into smaller, disconnected patches, making it more difficult for some pollinators to find food, mates, and suitable nesting sites. Fragmented landscapes may also reduce the movement of pollinators among plant populations, affecting both pollinator survival and plant reproduction.[26] Protecting, restoring, and reconnecting habitats has therefore become a central component of many pollinator conservation efforts.[27]

Production of many agricultural crops depends on pollinators, yet some modern agricultural practices can also reduce the habitat and resources they need to survive. Over time, many agricultural landscapes have become larger, more simplified, and dominated by fewer crop species, reducing the diversity of flowering plants, nesting habitat, and other natural resources that support pollinator communities.[28]

While these changes can improve the efficiency of food production in the short term, they may also reduce biodiversity across agricultural landscapes, threatening ecosystem service provision to agriculture and the sustainability of crop production.

Many crops bloom for only a short period each year, providing abundant food for some pollinators during flowering but relatively few resources before or after bloom.[29] Landscapes that integrate a diversity of land use and flowering plants throughout the growing season, whether through multiple crop species, flowering field margins, hedgerows, cover crops, or nearby natural habitats, can provide more continuous food and nesting resources for pollinators.[30]

Several countries use agricultural policy and financial incentives to support habitat conservation. In Switzerland, agricultural direct-payment policies include Biodiversity Promotion Areas (BPAs), which encourage farmers to manage portions of agricultural land for biodiversity. Across the European Union, the Common Agricultural Policy (CAP) includes eco-schemes and other agri-environment measures that provide financial incentives for farmers to adopt practices that support biodiversity,

An insectary strip at an almond orchard. Insectary strips help improve crop yields and preserve pollinator populations.

Credit: Pollinator Partnership

including pollinator habitat and more sustainable land management. In the United States, the Conservation Reserve Program (CRP) and the Environmental Quality Incentives Program (EQIP) provide payments, cost-share assistance, and technical support to help agricultural producers establish pollinator habitat and implement conservation practices that support biodiversity while maintaining productive working lands.[31]

Pesticides are widely used worldwide in agriculture, forestry, public health, urban landscapes, and other settings to manage insects, weeds, fungi, and other pests that can damage crops or affect human health and activities. In agricultural systems, pesticides help farmers protect crops, improve yields, and support food production and rural livelihoods. At the same time, pesticides may also affect non-target organisms, including pollinators, depending on the type of pesticide, how it is applied, the timing of application, and the species exposed.[32]

Pollinators can be exposed to pesticides through direct application, pollen, nectar, water, soil, or contact with treated plants and surrounding environments.[33] The effects of pesticide exposure vary considerably among compounds and among pollinator species. These differences reflect not only variation in species' sensitivity to pesticides but also differences in how bees encounter pesticides through their biology, nesting behavior, and life history, creating challenges for pesticide risk assessment.[34] While exposure may cause immediate mortality, it can also result in sublethal impacts on navigation, foraging behavior, reproduction, immune function, or other aspects of pollinator health.[35] Because pollinators are often exposed to multiple environmental stressors simultaneously, pesticide exposure may interact with habitat quality, nutrition, disease, and climate to influence overall resilience.[36]

Reducing risks to pollinators while maintaining the benefits that pesticides provide in agriculture, public health, forestry, and other settings is an active area of scientific research and policy development. Countries and regions have adopted different approaches to pesticide risk. For example, the European Union has restricted and later prohibited outdoor uses of three neonicotinoid insecticides after European Food Safety Authority assessments identified risks to honey bees and wild bees. This example illustrates how governments may apply precautionary restrictions when evidence indicates significant environmental risk while debates continue over how pesticide regulation should account for both pollinator protection and pest-management needs.[37]

Scientists have called for pesticide risk assessments that consider not only acute mortality but also sublethal effects, pesticide mixtures, and the diversity of wild pollinator species, recognizing that different pollinator species may have different responses and experience different routes and levels of pesticide exposure. Strategies such as reducing unnecessary pesticide use, selecting lower-risk pesticides where appropriate, carefully timing pesticide applications, conserving pollinator habitat and protecting it from pesticide applications, and integrating other risk-reduction measures can help minimize unintended impacts on pollinators and other non-target organisms while continuing to achieve pest management objectives.[38]

ENVIRONMENTAL AND BIOLOGICAL PRESSURES

Climate change is altering environmental conditions in ways that affect both pollinators and the flowering plants on which they depend. Rising temperatures, changing precipitation patterns, and more frequent extreme weather events are influencing ecosystems across the globe, creating new challenges for many species.[39] Although some pollinators may adapt by shifting their geographic ranges, others are struggling to keep pace with rapidly changing environmental conditions.[40]

One major consequence of climate change is the

Monarch butterflies are strongly impacted by climate change

Credit: Amber Barnes, Pollinator Partnership

disruption of **phenology**, the seasonal timing of biological events such as flowering, migration, emergence, and reproduction.[41] Many pollinators have evolved alongside plants whose flowering coincides with their periods of activity. As temperatures and seasonal conditions change, plants and pollinators do not always respond at the same rate or in the same direction. This increases the potential for **phenological mismatches**, in which pollinators emerge before or after the flowers they depend on. These mismatches can reduce food availability for pollinators while also limiting pollination for plants.[42] Climate change may also alter the quantity and quality of floral resources. Elevated carbon dioxide, drought, and heat stress can change the quantity and composition of nectar and pollen, potentially reducing the nutritional value of floral resources available to pollinators even where flowers remain abundant.[43]

Climate change can alter the geographic distribution of both plants and pollinators.[44] As suitable habitats shift toward higher elevations or latitudes, some species are expanding into new areas while others face shrinking ranges or become more isolated.[45] Climate change may also alter floral traits, pollinator behavior, and other features that influence pollination, even when plants and pollinators continue to occur in the same general area.[46] Extreme weather events, including prolonged droughts, heat waves, floods, and wildfires, may further reduce floral resources, damage nesting habitat, and place additional stress on pollinator populations.[47] Because climate change often interacts with habitat loss, disease, and other environmental pressures, its effects can be difficult to separate from other drivers of pollinator decline.[48]

Like other animals, pollinators are susceptible to various diseases and parasites that can affect their survival, reproduction, and overall health. Managed honey bees are particularly vulnerable to several parasites and pathogens. Among the most significant are the *Varroa destructor* mite and, in some regions, *Tropilaelaps* mites, both of which can weaken colonies directly while also increasing susceptibility to pathogens.[49] Wild pollinators can also be affected by pathogens, parasites, and fungal infections, although the types and impacts are less well-known and vary among species.[50]

Because managed and wild pollinators often share flowers and habitats, researchers are investigating how some pathogens may spread between species, a process known as **pathogen spillover**. Although evidence suggests spillover can occur under certain conditions, the extent to which it contributes to pollinator declines varies among pathogens, species, and ecosystems and remains an active area of research.[51] Disease can also interact with other environmental stressors, such as poor nutrition and pesticide exposure, potentially reducing pollinator resilience.[52] New Zealand uses import-health requirements, border controls, surveillance, and reporting systems to reduce the risk that exotic bee pests and diseases will enter or spread within the country. These measures are particularly relevant to managed honey bees and the beekeeping sector, although no biosecurity system can eliminate every pathway of introduction.[53]

Invasive species can alter pollination systems by changing habitats, competing with native species, or disrupting ecological relationships that have evolved over long periods of time. Some invasive plants may outcompete native flowering plants, reducing the timing, abundance, and diversity of food resources available to pollinators.[54] Similarly, introduced insects, animals, and pathogens may compete with, prey upon, or spread diseases to native pollinator populations.[55]

The impacts of invasive species vary widely among ecosystems and depend on the species involved. Beyond affecting individual plants or pollinators, invasive species can also alter the interactions among plants and pollinators that form pollination networks. Because these ecological relationships are interconnected, changes caused by invasive species can ripple through entire communities, with consequences that vary according to the invading species, the ecosystem, and existing ecological relationships.[56]

Pollinators may also be affected by several forms of environmental pollution. Air pollution can interfere with floral scents that many pollinators use to locate flowers, while artificial light at night, known as light pollution, may alter the behavior of nocturnal pollinators such as moths and disrupt interactions between plants and their pollinators.[57] Heavy metals, microplastics, and other environmental contaminants are also being investigated for their potential effects on pollinator health. Although pollution is generally considered a less well-understood driver of pollinator decline than habitat loss, pesticides, and climate change, growing evidence suggests that it may contribute to cumulative stress on pollinator populations.[58]

Evidence suggests that pollinator declines are rarely caused by a single factor, and therefore, no single conservation action can address every threat. Effective conservation therefore generally combines habitat restoration, sustainable land management, pesticide-risk reduction, research, and cooperation among governments, farmers, scientists, and communities.

POLLINATOR CONSERVATION AND BUILDING RESILIENCE

Pollinator conservation has evolved considerably

Evidence suggests that pollinator declines are rarely caused by a single factor, and therefore, no single conservation action can address every threat.

over the past several decades as scientific understanding of pollination systems has expanded and general awareness of the issue has increased. Early conservation efforts often focused on individual species or specific threats, such as pesticide exposure or habitat loss.[59] The growing understanding that pollinator declines are usually a result of multiple interacting factors has led to broader conservation approaches that emphasize protecting ecological processes while building resilient pollination systems rather than addressing individual threats in isolation.[60]

Modern pollinator conservation therefore combines habitat protection and restoration, sustainable land use, scientific research, education, policy development, and international collaboration.[61] Together, these integrated approaches seek to conserve pollinators while supporting biodiversity, food security, and sustainable land use.[62]

Healthy pollinator populations depend on landscapes that provide the resources needed throughout their life cycles, including diverse floral resources, suitable nesting habitat, and places to overwinter. Protecting existing natural habitats is one of the most effective ways to conserve these essential resources and the ecological interactions upon which pollinators depend.[63] Because many pollinators move through landscapes in search of food and nesting sites, or when migrating or dispersing, maintaining and restoring habitat connectivity can also improve the long-term resilience of pollinator populations.[64]

Habitat conservation and restoration can take many forms depending on local ecosystems and land-use practices. Examples include restoring native plant communities, protecting grasslands, forests, wetlands, and other natural areas, establishing pollinator habitat along roadsides and field margins, and creating pollinator-friendly green spaces in urban environments.[65] Some countries use financial mechanisms to encourage habitat conservation and restoration on private land. For example, Costa Rica's Payment for Environmental Services Program provides financial recognition to owners of forests and forest plantations for environmental services that include biodiversity protection, water protection, and climate regulation. Although the program is not specific to pollinators, it illustrates how governments can support the conservation and recovery of habitats that provide broad ecosystem benefits.[66] Although restoration strategies differ among regions, a common goal is to maintain diverse, locally native plant communities that provide continuous floral resources throughout the growing season, suitable nesting habitat, and habitat connectivity for pollinators.[67]

In many regions, restoration planning also draws upon generations of ecological stewardship by Indigenous Peoples and local communities, whose observations of local landscapes can help guide species selection, restoration priorities, and long-term management.[68] These contributions may include knowledge of locally important plant species, seasonal flowering patterns, traditional beekeeping practices, and land-management approaches such as agroforestry or mixed cropping that support pollinators while sustaining local livelihoods. For example, a community-based program in Kenya's Eburu ecosystem documents traditional Ogiek beekeeping and a range of local farming and land-stewardship practices relevant to pollinator conservation and sustainable land management.[69]

A growing body of research demonstrates that habitat restoration can produce measurable benefits for pollinator communities in a wide range of ecosystems. Restoration projects have been shown to increase wild bee abundance and species richness, even when they were originally designed to restore plant communities rather than specifically benefit pollinators.[70] Recent research also found that restoring urban parks through native wildflower plantings and reduced mowing rapidly increased pollinator species richness, with those gains persisting over multiple years.[71]

A pollinator-friendly habitat

Credit: Amber Barnes, Pollinator Partnership

Restoring pollinator habitat with native plants and protecting these areas from pesticides and disturbance will help provide not only floral resources but also nesting and overwintering habitat in which pollinators can reproduce and thrive.

Agricultural landscapes occupy more than one-third of the Earth's land surface and therefore play an essential role in pollinator conservation. Many crops depend on animal pollination, and at the same time, many pollinators often rely on agricultural landscapes for at least part of their food and habitat.[72] As a result, conservation efforts seek to integrate pollinator protection into agricultural production rather than treating food production and biodiversity conservation as separate goals.[73]

Pollinator-friendly agricultural land management can take many forms depending on local crops, ecosystems, and farming practices. Examples include conserving flowering field margins and **hedgerows** (rows of trees or shrubs planted along field edges), planting **cover crops** to protect and improve soil, reducing unnecessary disturbance to nesting habitat where appropriate, and minimizing habitat exposure to pesticides.[74] Studies of restored hedgerows have shown that they not only support more abundant and diverse native pollinator communities but can also increase the movement of native bees and pest control insects into adjacent crop fields, extending pollination and pest control services into the crop and providing economic benefits for farmers.[75] Research also demonstrates that agricultural landscapes containing a greater diversity of crops and natural habitats can support higher biodiversity and more diverse pollinator communities than simplified agricultural landscapes.[76] Countries differ, however, in how pollinator-friendly practices in agriculture should be encouraged. Some support regulatory requirements or conservation standards, while others favor voluntary programs, financial incentives, technical assistance, or market-based approaches that allow producers greater flexibility in implementation.

Many pollinator-friendly farming practices reflect principles that have long been used by Indigenous Peoples and local communities to steward productive landscapes while maintaining ecological diversity. Traditional approaches to

managing soils, native vegetation, seasonal resources, and landscape heterogeneity continue to inform sustainable agriculture in many regions, alongside contemporary ecological research.[77] Mexico's National Strategy for the Conservation and Sustainable Use of Pollinators (ENCUSP) illustrates one effort to coordinate scientific research, sustainable and biodiversity-friendly agricultural production, public policy, and the exchange of traditional knowledge. This strategy includes actions intended to involve local producers and Indigenous, farming, and Afro-Mexican communities in pollinator research, planning, and conservation.[78]

Building resilient pollinator populations also requires reducing the environmental pressures that contribute to pollinator decline. Because these pressures vary among regions, ecosystems, and species, conservation strategies should focus on addressing multiple threats simultaneously rather than any single factor in isolation. Holistic efforts may include reducing pesticide risks, managing invasive species, controlling diseases and parasites in managed pollinators, restoring degraded habitats, and helping ecosystems adapt to a changing climate.[79]

One example of a framework used to reduce pesticide risk across a variety of settings is **Integrated Pest Management (IPM)**, a widely used approach that combines biological, cultural, physical, and chemical methods to manage pests while minimizing unnecessary risks to non-target organisms, people, and the environment. Rather than relying exclusively on routine pesticide applications, IPM emphasizes monitoring pest populations, preventing pest outbreaks where possible, and selecting management strategies that are effective while reducing unnecessary pesticide use. When used in agricultural settings, IPM can help balance productivity with environmental protection and has become an important component of many sustainable agriculture and pollinator conservation strategies.[80]

Effective pollinator conservation depends on understanding how pollinator populations are changing over time and how they respond to conservation actions. Scientific research and long-term monitoring provide the information needed to identify threats, evaluate conservation strategies, and inform policy and management decisions. Because ecosystems are constantly changing, conservation strategies must also

Hummingbirds are also pollinators

Credit: Anthony Colangelo, Pollinator Partnership

change over time. This approach, known as **adaptive management**, uses monitoring and new scientific evidence to continually refine and improve conservation decisions.[81] In many regions, Indigenous Peoples and local communities have observed seasonal cycles, flowering patterns, species distributions, and other ecological changes across generations. These long-term observations can help identify environmental change, establish historical context, and inform local conservation priorities, particularly in areas where formal scientific monitoring has been limited.[82]

Monitoring pollinators can include field surveys, museum collections, long-term ecological studies, and **community science** programs in which members of the public contribute observations.[83] Monitoring programs often combine traditional field research, Indigenous and local knowledge, community science, and emerging technologies to better understand pollinator populations and inform conservation decisions.

Although scientific understanding of pollinators has expanded considerably over the past several decades, critical knowledge gaps remain due to the immense diversity of pollinator species and the lack of consistent long-term funding in many regions. For most species, researchers still lack basic information about their distribution, population trends, life histories, ecological requirements, and responses to environmental change. These gaps make it difficult to assess conservation status and prioritize management efforts in many parts of the world.[84]

One of the greatest challenges facing pollinator research is the limited availability of long-term monitoring data. While some regions maintain extensive monitoring programs for managed honey bees and certain groups of wild pollinators, most regions and countries lack consistent long-term datasets.[85] Studies in less extensively monitored regions are beginning to address some of these gaps. For example, research in Nepal's Shivapuri-Nagarjun National Park found that pollinating insect communities varied across habitat types and elevations, providing important baseline information about local pollinator diversity and distribution.[86] In addition, accurate identification of many pollinator species requires specialized taxonomic expertise, a challenge often described as a taxonomic impediment, also called a **taxonomic bottleneck**, that limits the speed and scale of biodiversity monitoring.[87]

New technologies are helping address some of these challenges. Artificial intelligence can assist with species identification through image analysis, while **environmental DNA** (eDNA) allows scientists to detect species using genetic material collected from soil, water, flowers, and other environmental samples.[88] Automated sensors, remote sensing, and community science programs are also expanding the scale at which pollinators can be monitored. Although these technologies cannot currently replace traditional field research, they are rapidly evolving and creating new opportunities to improve biodiversity monitoring and conservation planning. Access to monitoring technologies, technical expertise, and long-term funding varies considerably among countries, raising questions about how international organizations such as the FAO can support monitoring capacity, data sharing, and technology transfer in regions with limited research infrastructure.

Beyond improving species monitoring, researchers are increasingly evaluating the outcomes of habitat restoration, pollinator-friendly farming practices, and other conservation interventions to better understand what works, where, and why.[89] As monitoring programs and emerging technologies continue to improve data collection, scientists and policymakers will be better equipped to adapt conservation strategies in response to new evidence.[90]

Current Status

INTERNATIONAL POLLINATOR CONSERVATION

Pollinator conservation is a global challenge that extends beyond national borders. Some pollinator species migrate across national borders and have ranges that extend through multiple countries, while environmental pressures such as climate change, habitat loss, invasive species, and emerging pests and diseases affect ecosystems worldwide. Because these challenges are interconnected, no single country can address every aspect of pollinator conservation alone.[91]

International cooperation enables countries to share scientific knowledge, coordinate research and monitoring, develop conservation policies and strategies that are aligned and complementary, and exchange information on successful practices. As scientific understanding of pollinators has grown, international organizations have recognized that pollinator conservation is closely linked to sustainable agriculture, biodiversity, and food security on a global scale.[92]

Over the past several decades, a growing number of international organizations and agreements have advanced pollinator conservation through scientific assessment, technical guidance, policy frameworks, capacity building, and international cooperation. The **Food and Agriculture Organization of the United Nations** (FAO) supports countries in strengthening sustainable food systems through technical guidance, capacity building, and the promotion of sustainable agricultural practices, while helping advance global awareness of the importance of pollinators to agriculture and food security.

The FAO is currently developing, and seeking input on, a Global Pollinator Platform to strengthen international collaboration on pollinator conservation. The Platform is intended to bring together stakeholders to improve global coordination and knowledge sharing, support capacity development and technical and policy guidance, and foster partnerships. Because the Platform is still being developed, countries may differ in their views regarding its future role, including the extent to which it should focus on technical assistance, research coordination, information sharing, capacity building, or resource mobilization.

The **Convention on Biological Diversity (CBD)** recognizes pollinators as essential components of biodiversity and provides an international policy framework for their conservation, including through initiatives such as the **International Pollinator Initiative (IPI)**, which encourages countries to develop national pollinator conservation strategies adapted to their own ecological, agricultural, and socioeconomic circumstances. More recently, the **Kunming-Montreal Global Biodiversity Framework (GBF)** has reinforced the importance of conserving pollinators as part of global biodiversity goals while recognizing that implementation must be adapted to national and local priorities.[93]

The Convention on Biological Diversity recognizes pollinators as essential components of biodiversity

The **Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)** produces independent global scientific assessments that synthesize current knowledge on pollinators, pollination, and food production, providing evidence that supports policy and decision-making at national and international levels.[94]

These initiatives play different but complementary roles. The CBD provides an international policy framework and biodiversity goals, IPBES supplies independent scientific assessments to inform decision-making, and the FAO supports countries through technical guidance, capacity and partnership building, and agricultural expertise. Despite these efforts, many countries continue to face challenges related to monitoring capacity, implementation, coordination across sectors, and access to resources. These continuing challenges have helped shape discussions surrounding the development of the FAO's proposed Global Pollinator Platform.

Rather than prescribing a single approach, these initiatives provide scientific assessments, policy guidance, technical resources, and opportunities for collaboration that countries can adapt to their own environmental conditions, agricultural systems, and conservation priorities. By fostering collaboration and shared learning across countries, these initiatives help build more coordinated and effective responses to pollinator declines while allowing conservation strategies to be adapted to local ecological and socioeconomic conditions.

Although international cooperation provides an important framework, pollinator conservation is most often implemented at national, regional, and local levels. Ireland's All-Ireland Pollinator Plan (AIPP) relies heavily on voluntary participation by farmers, businesses, schools, local governments, and community groups.[95] The United States adopted a federally coordinated strategy that established national habitat restoration, research, and conservation goals for pollinator health.[96] France has integrated pollinator conservation into broader biodiversity and environmental policies through its National Plan for Pollinating Insects and Pollination.[97] Mexico recently launched the Estrategia Nacional para la Conservación y Uso Sustentable de los Polinizadores (ENCUSP), an 8-point strategy that seeks to integrate the cultural and ecological value of pollinators into agricultural and economic strategies. Significant attention was given to Indigenous knowledge systems in the development of this strategy. These examples illustrate how national priorities and governance structures can shape conservation strategies. Successful implementation depends on collaboration among governments, researchers, industry, farmers, land managers, and local communities while balancing biodiversity conservation with agricultural productivity and food security.[98]

GLOBAL STATUS OF POLLINATORS

Current scientific evidence indicates that pollinator population trends vary considerably among species, regions, and ecosystems. While some pollinator populations have experienced documented declines, others remain stable or have increased under certain conditions. This variation reflects differences in habitat, land use, climate, conservation efforts, and the availability of long-term monitoring data. As a result, scientists generally avoid broad conclusions about all pollinators and instead evaluate trends within defined geographies for individual species or groups where sufficient evidence exists.[99]

Although the availability of data varies among regions and species, several global assessments have concluded that many pollinator groups face increasing pressures from habitat loss, climate change, pesticides, diseases, invasive species, and other interacting stressors.[100] Wild bees, butterflies, and some other pollinating insects have shown documented declines in parts of Europe and North America. For example, an assessment of North American bumble bees found that the relative abundances of four of

eight species studied had declined by up to 96 percent, while their surveyed geographic ranges contracted by 23–87 percent, some within the previous two decades.[101] Recent analyses of more than 1,000 wild bee species across the contiguous United States have documented widespread changes in species occupancy, although trends vary among species and regions.[102] Additionally, a continental-scale analysis found that butterfly abundance across the contiguous United States declined by approximately 22 percent between 2000 and 2020.[103] A broad assessment of nearly 1,600 native pollinator species in the United States and Canada found that more than one in five were at elevated risk of extinction, with bees among the groups facing the greatest risk.[104] However, information remains limited for many regions of Africa, Asia, Latin America, and Oceania, highlighting important gaps in global monitoring.[105]

Managed and wild pollinators face different but overlapping challenges. Managed honey bee colonies can often be replaced or replenished by beekeepers, even when individual colonies experience losses.[106] In contrast, declines in wild pollinator populations may be more difficult to detect and reverse because many species are not routinely monitored and cannot be actively managed.[107] Conserving both managed and wild pollinators therefore remains a crucial priority for supporting biodiversity, resilient agricultural systems, and food security.[108]

Despite ongoing challenges, conservation efforts have also demonstrated encouraging results in some regions. One example is Ireland's AIPP, which, though built on a voluntary framework, has expanded steadily since its rollout in 2015. It now includes more than 120 organizations, 400 businesses, and all 42 local councils across the island.[109] This example illustrates that pollinator declines are not inevitable and that coordinated conservation efforts can produce measurable benefits when adapted to local ecological and agricultural conditions.[110]

CHALLENGES AND OPPORTUNITIES

Around the world, pollinators are recognized as essential to biodiversity, agriculture, and food security. The challenge now is determining how best to conserve them while meeting growing demands for food production, economic development, and environmental sustainability. As a result, pollinator conservation has become both a scientific and a policy challenge that requires balancing multiple, and sometimes competing, priorities.[111]

Many decisions that affect pollinators also present opportunities for conservation. Designing cities, transportation corridors, energy infrastructure, managed forests, and other working landscapes with pollinators in mind can help conserve habitat and protect pollinators while continuing to meet economic and societal needs. One of the most significant examples involves balancing agricultural productivity with pollinator conservation. Farmers depend on healthy pollinator populations to produce many crops, yet they must also respond to changing environmental conditions, pest pressures, market demands, and the need to maintain viable

Butterfly abundance across the contiguous United States declined by approximately 22 percent between 2000 and 2020

Credit: Pollinator Partnership

agricultural systems. Policies and programs that encourage pollinator conservation in agricultural landscapes should balance ecological goals with the practical realities faced by agricultural producers.[112] Countries differ in how this balance should be achieved. Some favor stronger conservation requirements and environmental safeguards, while others emphasize voluntary programs, incentives, or flexibility for producers.

Another key area of discussion is how conservation decisions can be informed by multiple knowledge systems. Scientific research and the knowledge of Indigenous Peoples and local communities provide complementary perspectives for understanding ecosystems and developing practical conservation strategies. Indigenous and local knowledge systems are grounded in long-term relationships with place and can contribute information about seasonal flowering patterns, locally important plant species, pollinator behavior, traditional beekeeping practices, and land-management approaches that have supported biodiversity and livelihood for generations. Scientific research contributes additional approaches for studying ecological processes across larger geographic areas and longer periods of time. Successful international conservation efforts recognize that respecting the integrity of each knowledge system, rather than expecting one to validate the other, can strengthen biodiversity conservation and environmental decision-making.[113]

While many countries have increased support for pollinator conservation, available resources vary widely, particularly in regions with limited financial or technical capacity. International partnerships, public-private collaborations, and innovative funding mechanisms are being explored to help expand conservation efforts.[114]

Looking ahead, many questions surrounding pollinator conservation remain unresolved. Countries continue to debate how conservation efforts should be funded, what responsibilities should be shared among governments, agricultural producers, businesses, and consumers, how pesticide risks should be managed, and how farmers can be supported while transitioning to more pollinator-friendly practices. Recent discussions in countries such as Brazil demonstrate that even where pollinator conservation is widely recognized as

important, coordinating policies across sectors and institutions remains a significant challenge.[115] Successful implementation will require countries to decide how conservation should be financed, whether pollinator-friendly practices should be voluntary or mandatory, how pesticide risks should be regulated, and how farmers can be supported during the transition to new practices.

Bloc Analysis

Although most countries recognize the importance of pollinators, they do not always agree on how pollinator conservation should be achieved. Differences in environmental conditions, agricultural systems, economic priorities, governance, and available resources often lead countries to support different policy approaches. Major disagreements include whether pollinator protections should be mandatory or voluntary, how strictly pesticides should be regulated, who should pay for conservation, and whether all countries should be expected to meet similar standards and timelines. As a result, delegates may find themselves aligning with different countries on different issues rather than negotiating within fixed blocs.

PRIORITIZING LONG-TERM ECOLOGICAL RESILIENCE

Countries that emphasize this perspective generally view healthy pollinator populations and broader biodiversity as the foundation of resilient ecosystems, long-term food security, and economic prosperity. They often argue that development should mitigate impacts to natural systems, that agricultural systems should be managed in ways that reduce pressures on pollinators, and that governments should play a leading role in protecting biodiversity through conservation policy, environmental regulation, and long-term planning. From this perspective, the short-term costs of stronger conservation measures may be justified by reducing long-term risks to biodiversity, food security, and economic stability. Delegates representing this perspective may therefore support precautionary approaches when scientific uncertainty exists, particularly when there is evidence that environmental pressures could contribute to long-term pollinator declines. They may be willing to restrict certain pesticides, require habitat protections, or establish enforceable conservation standards even when producers argue that these measures will increase costs.

As a result, these countries often advocate stronger environmental monitoring, national pollinator conservation strategies, habitat protection and restoration, ecological connectivity, pollinator-friendly agricultural standards, and international guidance that reduces unnecessary risks to pollinators, including science-based approaches to pesticide regulation and pest management. They may also support deadlines, national reporting requirements, and measurable habitat-restoration targets rather than relying entirely on voluntary participation. Examples of policies associated with this perspective include Ireland's All-Ireland Pollinator Plan, France's national pollinator action plans, and other initiatives that emphasize biodiversity conservation, habitat restoration, and long-term ecological resilience.

Critics of this approach may argue that strict standards can raise production costs, limit farmers' access to pest-management tools, or place unequal burdens on countries with fewer financial and technical resources.

SUPPORTING SUSTAINABLE AGRICULTURAL PRODUCTIVITY

Countries adopting this perspective generally recognize the broader ecological and biodiversity benefits of pollinator conservation but place particular emphasis on advancing agricultural productivity, farmer livelihoods, and food security through conservation-compatible approaches. These delegates tend to emphasize conservation approaches that also maintain productive,

Credit: Amber Barnes, Pollinator Partnership

economically viable agricultural systems. Delegates representing this perspective may argue that conservation measures are most likely to succeed when they align with the practical realities faced by farmers and agricultural producers, particularly where concerns exist about production costs, food security, or the availability of effective alternatives to existing pest-management tools. Rather than relying primarily on regulation, they typically support scientific innovation, research, and improved voluntary farming practices that encourage conservation within working agricultural landscapes. They may oppose broad pesticide bans or uniform habitat requirements when affordable and effective alternatives are not available to farmers. Instead, they generally favor evaluating agricultural chemicals and conservation measures according to crop, region, level of risk, and available scientific evidence.

As a result, these countries may advocate increased investment in research and development, farmer education, pest management strategies such as IPM, pollinator-friendly crop management practices, and public-private partnerships that encourage innovation while supporting both agricultural productivity and pollinator conservation. They are likely to argue that farmers will adopt conservation practices more successfully when governments provide workable alternatives, technical assistance, and financial support rather than imposing immediate restrictions. Examples of policies associated with this perspective include Switzerland's Biodiversity Promotion Areas and the United States Conservation Reserve Program, which use incentives and conservation planning to support pollinators while maintaining productive agricultural landscapes.

Critics may argue that voluntary programs are implemented unevenly, allow harmful practices to continue, and may not produce conservation gains quickly enough to prevent further declines.

STRENGTHENING CAPACITY AND EQUITABLE IMPLEMENTATION

Countries emphasizing this perspective generally recognize pollinator conservation as important but emphasize that successful conservation must reflect differences in ecological conditions, development priorities, available resources and

capacity, and food security needs. Delegates representing this perspective may argue that countries should not be expected to meet the same conservation goals or timelines without comparable financial resources, technical capacity, monitoring infrastructure, and access to technology. They may therefore support differentiated timelines and nationally determined conservation strategies rather than uniform international requirements. They may also argue that wealthier countries and industries that have benefited most from intensive agricultural production should contribute more toward the cost of conservation.

As a result, these countries may advocate greater technical assistance through organizations such as the FAO, expanded capacity-building and training, international financing, equitable access to technology, support for smallholder farmers and community-based conservation, and locally adapted strategies that strengthen both climate resilience and sustainable development. They may also support greater contributions from wealthier countries, international organizations, and private-sector partners to help fund conservation efforts, monitoring programs, habitat restoration, and scientific research.

However, they may resist funding arrangements that impose policies designed without meaningful local participation or make assistance dependent on standards that lower-income countries cannot immediately meet. They may also oppose the use of pollinator standards as disguised restrictions on agricultural trade. This perspective may be particularly relevant for biodiversity-rich countries facing resource constraints and countries balancing conservation goals with broader development priorities. Their critics may argue that differentiated standards and flexible timelines could weaken accountability or delay urgent conservation measures.

In practice, few countries align completely with any single perspective. Most seek to balance competing environmental, industrial, agricultural, economic, and social priorities in ways that reflect their own national circumstances. These positions are not fixed, as a country might support stronger pesticide regulation while favoring voluntary habitat programs or request international financing while accepting measurable reporting requirements. Understanding these differing priorities will help delegates anticipate areas of agreement, recognize potential sources of disagreement, and negotiate more effective solutions during committee.

Committee Mission

The Food and Agriculture Organization of the United Nations (FAO) plays a central role in advancing sustainable agriculture, improving food security, supporting rural livelihoods, and promoting the sustainable management of natural resources. Although responsibility for implementing pollinator conservation ultimately rests with individual member states, the FAO provides a crucial forum for international cooperation by promoting scientific research, developing technical guidance, strengthening national capacity, and facilitating the respectful exchange of scientific, Indigenous, and local knowledge and best practices among countries.[116]

As delegates to the FAO, committee members should consider how international cooperation can support practical, science-informed approaches to pollinator conservation while recognizing the diversity of agricultural systems, ecosystems, economic conditions, and national priorities represented by member states. Recognizing that no single approach will be appropriate for every country, delegates should explore policies that are adaptable, evidence-based, and capable of supporting both biodiversity conservation and resilient food systems under a wide range of local circumstances.

As delegates develop proposals, they may wish

to consider questions such as how the FAO can strengthen technical assistance and capacity-building, encourage research and innovation, incorporate pollinator conservation across sectors and landscapes, support farmers in adopting pollinator-friendly practices, promote international collaboration, and facilitate the sharing of knowledge across regions. Delegates should also consider how conservation efforts can respect multiple knowledge systems, respond to emerging scientific evidence, and remain accessible to countries with different levels of technical and financial capacity.

Ultimately, the committee's goal is not simply to conserve pollinators but to develop collaborative recommendations that recognize the remarkable diversity of pollinators, ecosystems, industries, agricultural systems, and the communities that depend upon them. By balancing scientific evidence with practical implementation, delegates have the opportunity to develop recommendations that strengthen biodiversity, food security, and international cooperation across the varied ecological, agricultural, and socioeconomic realities of FAO Member States.

Credit: Amber Barnes, Pollinator Partnership

TOPIC B

Desertification and Food Security

FAO | NHSMUN 2027

Photo Credit: Sivabalachandar03

Introduction

Water scarcity and land degradation are major threats to food security, and their effects stretch far beyond the farms they directly impact. Water scarcity occurs when there is not enough freshwater in an area to meet human and environmental needs.[117] Land degradation refers to the decline of soil quality, making it harder for land to support healthy plant growth. Together, these problems contribute to desertification. The United Nations defines desertification as land degradation in arid, semi-arid, and dry sub-humid regions.[118] Desertification does not necessarily mean that existing deserts are physically expanding. Instead, it means that dryland ecosystems are losing their ability to support crops, livestock, wildlife, and human communities.

Desertification can lower agricultural production, reduce rural incomes, disrupt supply chains, and raise food prices. These effects are especially serious for low-income households, small farmers, and countries that depend heavily on agricultural trade. As a result, preventing land degradation is central to improving food security and protecting rural livelihoods.[119]

Water scarcity can both contribute to and result from the degradation of drylands. Limited rainfall, drought, excessive water withdrawal, and poorly managed irrigation can damage soil and vegetation. As land becomes degraded, it absorbs and stores less water, further increasing pressure on already limited supplies.[120] The World Resources Institute reports that 25 countries and approximately one quarter of the world's population face extremely high water stress.[121] Water stress occurs when the demand for water comes close to the available supply. This leaves little room for unexpected increases in demand. Countries facing this issue struggle to manage the water they have, but many also face growing populations and a rising water demand. During droughts, it becomes harder to decide how water should be used between farms, homes, and businesses, while also supporting food production.

Land degradation creates a similar problem. Land is important for food security because it supports farming, livestock, and rural communities. Rural communities can lose income and job opportunities due to a loss of fertile land for crops and grazing. This can worsen poverty and weaken local economies. It especially affects areas where people depend heavily on agriculture. These problems can also translate into social and political instability. When fertile land and clean water become harder to access, governments have to manage food aid, migration, and conflict over water and land distribution. This can escalate tension between local communities and the government.[122]

Although countries generally agree that land and water must be protected, they disagree about how to do so. Some prioritize large-scale irrigation, drought-resistant crops, and agricultural technology to maintain food production. Others emphasize locally led restoration, traditional land-management practices, and protections for small farmers and pastoralists. Countries also disagree over whether international assistance should take the form of grants, loans, private investment, or technology transfer. These disagreements will shape how the FAO can help countries address desertification without threatening food production or rural livelihoods. Overall, countries need long-term strategies to protect land and water resources. By protecting these resources, countries can strengthen food security, support

rural livelihoods, and lessen the impacts of desertification.

History and Description of the Issue

CAUSES AND IMPACTS OF DRYLAND DEGRADATION

The United Nations Convention to Combat Desertification (UNCCD) defines desertification as land degradation in arid, semi-arid, and dry sub-humid regions caused by climatic variations and human activities.[123] Dryland ecosystems are naturally vulnerable to changes in rainfall and temperature, but human activities can place them under additional pressure. Activities like overusing land, cutting down trees, and misusing water can damage vegetation, soil, and water resources. Further, land recovery can take a long time in these environments. This means desertification is not only about dry land expanding but also about productive drylands losing the soil, water, vegetation, and biological activity needed to support ecosystems and human livelihoods.[124]

Overgrazing, deforestation, and unsustainable farming practices are among the main causes of desertification. Overgrazing occurs when too many animals feed on the same land for a prolonged period of time. This is especially harmful in dry areas where grasses and shrubs need time to grow back after animals eat them. If livestock keep returning before the land has enough time to recover, plants become weaker and can eventually disappear.[125] Further, plant roots hold the soil together and prevent wind and water from carrying it away. If the plants are gone, topsoil is exposed and can be blown away. The topsoil has many of the nutrients that are essential for the growth of the crops. Without it, the soil may lose its ability to retain moisture, support root growth, and provide nutrients for plant growth.[126] As a result, soil becomes less fertile, the quality of land decreases, and livestock struggle to find food.

Another major cause of desertification is deforestation. Deforestation is the clearing or removal of trees from land. Forests may be cleared for agriculture, firewood, construction, infrastructure, and other human needs.[127] Trees and shrubs also help protect dryland soil by blocking wind, holding loose ground in place,

Harsh winds play a major role in soil erosion

Credit: Jim Bain / Soil erosion, brownout / CC BY-SA 2.0

and helping water soak into the soil. Although clearing forests may provide land and resources for short-term economic development, removing vegetation also eliminates an important source of protection for the soil. This results in the ground being drier and easier to erode. As a result, short-term human benefits can lead to long-term damage to the land.[128]

Unsustainable farming also plays a role in dryland degradation. While certain farming methods may work in the short term, they create long-term problems for the agriculture industry. Monocropping is a practice where farmers plant the same crop over and over again. When only one crop is repeatedly planted in an area, the same nutrients may be removed from the soil each growing season unless they are replaced through careful management. Additionally, limited crop diversity and periods when soil is left uncovered can make land more vulnerable to erosion. This causes the land to become weaker and less fertile over time. However, crop rotation or diversification is not always economically practical for farmers. In most areas, farmers need to be able to grow specific, desirable foods to make an income, so they plant the same reliable crops again and again. While monocropping may be successful in the short-term, the long-term damage can cause major problems. Over time as the land degrades, farmers may need to compensate for the poor quality of the land with more water and fertilizer to yield the same amount of food.[129]

Another cause of desertification is unsustainable irrigation. Irrigation is the process of supplying water to crops through human-made systems. It is often used when rainfall is not enough for crop growth. These systems commonly include canals, pipes, and sprinklers. Irrigation helps crops grow, but it can also cause severe damage when managed unsustainably. One major problem within irrigation is salinization, which occurs when salt builds up in the soil. This happens when the water in irrigation systems evaporates and leaves the dissolved salts behind. This makes the soil too salty and makes it difficult for crops to absorb water. For example, parts of Central Asia have experienced severe soil salinity because of decades of inefficient irrigation practices.[130]

Moreover, while desertification is often linked to a lack of water, too much water or the improper use of water can also cause soil damage. Poor drainage systems prevent excess water from leaving the soil. This can lead to problems such as waterlogging, which is when soil becomes saturated with water and lacks enough oxygen for plant roots to survive.[131] In the worst cases, farmers have had to completely abandon fields because of drastic decreases in crop yields, primarily due to water damage over time. This phenomenon highlights that improving access to water is not enough to prevent agriculturally driven land degradation. Instead, solving this problem requires sustainable use and management of water to prevent the spread of soil degradation.[132]

Human activity is only one part of the problem. Climatic conditions can also contribute to land degradation. Drought and environmental change worsen the problems associated with desertification. While a single drought may be temporary, repeated droughts can push land

In the worst cases, farmers have had to completely abandon fields because of drastic decreases in crop yields.

into long-term decline.[133] The United Nations Office for Disaster Risk Reduction describes desertification as a slow-onset disaster because its effects accumulate gradually over time. This process does not happen suddenly. Instead, it occurs when practices that harm the land compound over long periods of time. Climate change adds to this because hotter temperatures dry out soil faster and make rainfall less reliable. When climatic pressures are paired with harmful human activities such as overgrazing, deforestation, and unsustainable farming, land degradation can accelerate. This leaves soil and vegetation with less time to recover, potentially causing long-term declines in land productivity.[134]

The Sahel region of Africa provides a clear example of this challenge. The UNCCD's 2019 West Africa Thematic Report describes the Sahel as the region that experienced the greatest rainfall anomalies in the world during the twentieth century, with recurring droughts and large year-to-year variations in both rainfall and vegetation productivity.[135] Rising temperatures and unpredictable rainfall can make crops more vulnerable, while droughts and intense storms can damage vegetation and expose soil to erosion.[136] When combined with overgrazing, deforestation, and intensive agriculture, these climatic pressures can further degrade already fragile landscapes.[137] All of these pressures combined make it difficult for communities to restore degraded land and ensure food security. The Sahel therefore demonstrates how climatic pressures and human land use can interact, making both restoration and long-term food security more difficult.

AGRICULTURAL PRESSURE ON SOIL AND WATER RESOURCES

Agriculture depends on healthy soil and reliable water, making food production especially vulnerable to the loss of either resource. This relationship is especially important in drylands, where limited and unpredictable rainfall already places pressure on agriculture. When soil becomes less productive or water becomes harder to access, crop yields and livestock production may decline. Desertification is therefore not only an environmental issue; it also threatens food security and rural livelihoods.

Agriculture accounts for about 70 percent of global freshwater use.[138] Freshwater sources, including rivers, lakes, and groundwater, are heavily pressured in drylands. The high demand for freshwater means that often, water is withdrawn from rivers and underground aquifers faster than natural processes can replenish it. As a result, groundwater levels can fall, rivers may carry less water, and irrigation systems can become less reliable. A 2020 report from the FAO's State of Food and Agriculture cites water problems as the main limitation of farming.[139]

Two main factors to consider are physical water scarcity and economic water scarcity. Physical water scarcity occurs when there is not enough water available in a region. Jordan provides an example because it has extremely limited renewable freshwater resources and declining groundwater supplies.[140] In contrast, economic water scarcity occurs when water exists in a region, but states lack the resources to access it. The Democratic Republic of the Congo possesses immense freshwater resources, but limited infrastructure and public services prevent many households and rural communities from accessing safe and dependable water.[141] Both forms of scarcity can affect agriculture: physical scarcity limits the water available for irrigation, while economic scarcity can prevent farmers and rural communities from accessing and managing available supplies. As climate change worsens and droughts become more frequent, these challenges are expected to increase.[142]

Healthy soil can help land withstand long, dry periods because it contains minerals, organic matter, water, air, and living organisms that help store water, provide nutrients, and support plant roots. As soil loses organic matter, nutrients, structure, and biological activity, it becomes less fertile and less capable of supporting

agriculture.[143] Degraded soil leads to weaker crops and lower yields. Soil security is closely connected to global food security because food production depends on protecting fertile soil.[144] In drylands, rebuilding lost soil can take decades, making erosion a serious threat to agricultural productivity. If the land becomes too degraded, farmers may be forced to abandon their fields.[145]

Growing populations and increasing food demand create agricultural pressure. Farmers may need to produce more crops and raise more livestock on the same land than in the past. This leaves less time for the soil to recover. As a result, farmers may rely on increasing amounts of fertilizer and water to maintain previous crop yields. Although these measures can support production in the short term, continued degradation can eventually damage the soil so severely that additional fertilizer is no longer enough to restore its productivity.[146] This creates a feedback cycle: declining land productivity encourages more intensive use of soil and water, which can accelerate the original degradation. Governments must therefore find ways to meet immediate food needs without sacrificing the long-term productivity of agricultural land. Agricultural education, efficient irrigation, soil-conservation practices, and land-restoration programs can help farmers maintain production while reducing further degradation.[147]

Countries need long-term plans to protect soil and water. Sustainable land management, better irrigation, soil restoration, and climate-resilient farming can help farmers maintain food production while reducing additional land degradation. Governments must decide how to balance immediate production needs with the long-term protection of agricultural land. This is especially important as the world population is expected to hit nearly 10 billion people by 2050, placing additional pressure on food systems, agricultural land, and water resources.[148]

EFFECTS ON RURAL FARMERS, PASTORALISTS, AND FOOD ACCESSIBILITY

The effects of desertification are felt most directly by people who depend on land for survival. Rural farmers, pastoralists, and low-income communities are often the first to suffer from desertification. The food, income, and daily life activities of these groups are connected to the quality of the land. When soil degrades, these groups lose more than just farmland. They also lose stability. This makes desertification to both an environmental and financial issue. It directly affects how much food can grow, how many animals can be raised, how much income is available, and whether families can remain in their communities.[149]

In areas where people depend heavily on farming or herding, damaged land can force families to move, searching for better land or work. Up to 216 million people could be forced to migrate globally by 2050 due to a combination of desertification, drought, declining crop productivity, and water scarcity, according to estimates shared by the Geneva Environment Network based on UNCCD data.[150] This creates larger problems because migration can put pressure on nearby cities, increase competition

In drylands, rebuilding lost soil can take decades, making erosion a serious threat to agricultural productivity.

Farmers tending crops in dry soil

Credit: Ibn Dagara

for jobs, and make it harder for governments to provide basic needs like food and housing.[151]

Pastoralists are people who depend on livestock, such as cattle, sheep, goats, or camels, for food and income. Their animals need grazing land and water to survive. When vegetation declines, there is less grass and fewer shrubs for these animals to eat. When water sources dry up or become unreliable, herders must travel farther with their herds. This creates stress for both people and livestock. Animals may become weaker, produce less milk, lose weight, or die. For pastoral families, this is a major loss because livestock are often one of their most important forms of revenue. Losing animals can mean losing food, savings, transportation, and income all at once.

During droughts, pastoralists may move their herds into farming areas in search of water and grazing land. Livestock may then damage crops, while fences or expanding farms may block traditional livestock routes. Some disputes can be resolved through local leaders, grazing agreements, compensation, or community mediation. However, when land ownership is unclear, governments may struggle to manage disputes, leading to livestock theft, destroyed crops, displacement, or violence between communities.[152]

Such is the case in Nigeria. Farmers require land to grow crops, but pastoral herders need access to pasture and migration routes for their livestock. Both groups live on a declining amount of productive land, which has made competition fierce. The United Nations Human Security Unit describes the struggle between farmers and herders over farmland and pasture in Nigeria as a serious and escalating conflict that has caused significant casualties and threatened the livelihoods and security of both groups.[153] For these reasons, desertification extends beyond an environmental concern and can also affect migration, economic stability, urban services, and relationships among communities.

Small farmers are especially vulnerable because they depend on the same land year after year. When land is healthy, farmers can grow crops with few outside resources. The soil can hold water, support roots, and provide nutrients. But when the land becomes degraded, farmers have to work harder and spend more money to

produce the same amount of food. Crops may grow slower, fail more often, or produce smaller harvests. This hurts farmers because they lose food for their families as well as income from selling crops.[154] The Food and Agriculture Organization (FAO) and its partners recognize that food insecurity is a serious global issue, and many people are unable to regularly access enough safe and nutritious food.[155] Desertification adds to this problem because it weakens the land that many rural families depend on for nutrition, creating food insecurity.

Lower crop yields also create financial burdens. When farmers produce less food, they have less to sell in markets. This lowers household income and makes it harder to afford agricultural inputs such as seeds, fertilizer, and equipment. It also makes it more difficult for families to afford personal costs like schooling or medical needs. As the land becomes less productive, farmers earn less money and then have fewer resources to restore or protect their land. Over time, rural poverty worsens because families are trapped between declining land quality and rising farming costs.[156]

When farms produce fewer crops, there is also less food for transport companies, storage facilities, mills, food processors, wholesalers, and retailers to handle. These businesses may lose income, reduce employee hours, or eliminate jobs. If production falls across a large region, governments may become more dependent on imported food. When this occurs, consumers face higher prices and less reliable supplies. Thus, desertification of lands and farms can quickly spread and impact entire societies. To avoid this, governments must focus on building resilient food systems to produce food even when land, water, and climate conditions become more difficult.[157]

The Global Report on Food Crises explains that food crises are often driven by overlapping pressures such as conflict, economic shocks, climate extremes, and displacement.[158] Desertification can intensify these pressures by weakening livelihoods and worsening already difficult conditions. One significant consequence is reduced access to food. Food security is not only about whether food exists, but also whether people can afford and reach it. When local harvests decline, food availability in nearby markets decreases. When livestock herds shrink, so does the availability of meat, dairy, and other animal products. When food becomes scarce, prices rise. This significantly impacts low-income households. Low-income households are most at risk for food insecurity because they already spend a large share of their income on food. If prices rise even a little, families may have to buy cheaper foods, eat smaller portions, or skip meals.[159]

Migration is another consequence of desertification. When farming and herding no longer provide enough food or income, some families are forced to leave rural areas in search of work. Sometimes this movement may be temporary, such as when some family members leave for seasonal work. In other cases, entire families may be forced to abandon their homes to find employment. While migration can help families survive, it also creates new challenges. People who move to large cities may face crowded housing, limited jobs, and higher living costs. Rural areas may also lose workers, which makes it harder for communities to maintain farms, care for livestock, and rebuild local economies.[160]

Because this movement is partly caused by drought, water scarcity, declining crop production, or damaged grazing land, it can be described as climate-related migration. Desertification is rarely the only reason for relocation. But when combined with poverty, unemployment, conflict, and rising food prices, remaining in farming communities is no longer sustainable. Whether movement is temporary or permanent, the effects of climate-related migration impact individuals, communities, and governments.[161]

Women and children can be affected by

desertification in specific ways. In many rural communities, women play a major role in growing food, collecting water, preparing meals, and caring for animals. When water sources are farther away or crop yields decline, their workload may increase. Children may also be pulled from school to help with farming, herding, or collecting water, reducing opportunities for education. Additionally, when food becomes less available, children are more likely to suffer from poor nutrition. These effects can last for years because hunger and lost education can limit future opportunities.[162]

Addressing this issue requires long-term support. Sustainable land management can help farmers protect soil, use water more carefully, and restore damaged land.[163] However, farmers and pastoralists often need training, funding, and local support to make these changes possible. One example is FAO's Action Against Desertification program, which supports the restoration of drylands and grazing areas in several African countries. The program places rural communities at the center of restoration by preparing damaged soil, planting native grasses and trees, restoring land for farming and grazing, and creating local committees to help manage restored areas. In Niger, FAO has supported the restoration and management of more than 20,000 hectares across 55 sites.[164] This program demonstrates how international funding and technology can be combined with local participation to improve land for both farmers and pastoralists. Programs like these are necessary to secure the future of farming.

Overall, desertification is much more than damaged soil. Its impacts threaten entire communities. Without intervention, families will continue to struggle to afford food as prices rise. In some cases, they may even be forced to migrate, searching for work or better land. Therefore, protecting rural livelihoods and food accessibility begins with protecting soil.

INTERNATIONAL RESPONSES TO DESERTIFICATION

Land degradation often crosses borders. Dryland regions are linked through shared water systems, trade, migration routes, and climate patterns. This makes international cooperation very important in addressing this issue. While countries need individual plans, they also need global support, funding, research, and shared goals within the international community. The main aim of the international response is to slow land damage, restore land, support rural communities, and improve farming systems.[165]

One key framework is the aforementioned United Nations Convention to Combat Desertification (UNCCD). This convention focuses on desertification and drought. It especially focuses on countries with serious land damage. It recognizes that desertification is linked to poverty, hunger, and environmental harm. This is important because it treats desertification as both an issue that affects both the environment and human lives. The UNCCD helped to establish an international framework, but most action is carried out within individual countries through national plans. Countries also cooperate through regional programs when they share dryland

In Niger, FAO has supported the restoration and management of more than 20,000 hectares across 55 sites.

Residents of Mbale District, Uganda, spend hours waiting to access water

Credit: LUBEGA IBRAHIM

ecosystems, water resources, migration routes, or similar environmental challenges. These plans address both environmental protections and the needs of people who depend on the land.[166]

A major part of the UNCCD is the use of national action plans. These plans outline specific goals and strategies individual countries can take to work toward solving this issue, while also including local examples of desertification. This is important because desertification looks different in each place. In some areas, overgrazing is the main issue. In others, it may be poor irrigation, deforestation, or drought. National action plans allow countries to respond in ways that fit their land and communities. These plans may include restoring soil, improving water use, planning for drought, supporting farmers, or setting land-use rules.

Although these plans are designed for individual countries, international cooperation still plays an important role. Countries can share information about drought monitoring, soil conditions, restoration methods, and successful farming practices. International organizations may provide technical experts, satellite data, training, and funding. Neighboring countries can also coordinate grazing routes, watershed management, and restoration projects. This allows countries to learn from one another instead of developing every strategy on their own. This helps not only to fix damage but also to prevent future problems.[167]

Another important goal of the UNCCD is Land Degradation Neutrality (LDN). This is the idea that countries should balance land damage with land restoration. In simple terms, if land is damaged in one place, it should be restored somewhere else. This helps prevent any net loss of healthy land. The UNCCD's Target Setting Programme helps countries measure their land, set goals, and track progress toward LDN by 2030. The program provides countries with land data and a framework to identify where degradation is occurring, establish a national baseline, select priority areas, and create measures to avoid, reduce, or reverse land damage. Participation is voluntary and available to parties to the UNCCD, allowing each country to establish targets that match its own environmental and development needs. As of June 2025, 113 countries had successfully

established and technically validated voluntary LDN targets and related measures.[168]

LDN is also linked to the United Nations Sustainable Development Goals (SDGs). Specifically, Goal 15 focuses on "Life on Land," and Target 15.3 calls for action to stop desertification and restore land by 2030. The SDGs connect desertification to larger global goals. They link land restoration to biodiversity, forests, farming, and climate action. It also notes that restoring land can improve food security, protect ecosystems, support rural economies, and reduce pressure on water.[169]

The FAO plays a key role in promoting sustainable land management. This means using soil, water, plants, and animals in ways that meet current needs while also protecting future supplies. While farmers need to grow crops now, they also need to keep the land healthy for future uses. FAO supports practices that protect soil, store water, reduce erosion, and improve farming methods overall. These include planting trees, rotating crops, restoring soil, improving irrigation, and managing grazing more carefully.[170]

One project that supports this is the Great Green Wall. This African-led effort began in the Sahel, a dry region south of the Sahara Desert. It was created in response to severe land degradation, desertification, food insecurity, and declining rural livelihoods across the Sahel and Sahara. The goal of the project is to restore land, support communities, improve food security, and create jobs. The project aims to restore 100 million hectares of land, store 250 million tons of carbon, and create 10 million jobs by 2030.[171] This project emphasizes that land restoration is not just about trees but also about improving lives.

The Great Green Wall connects environmental goals with human needs. Restored land can help farmers grow more crops and give pastoralists better grazing areas. Communities can gain stronger markets and better protection from drought. New jobs can also reduce the need for migration. Local responses have varied because the Great Green Wall is made up of many projects across different countries. Communities have generally responded more positively when restoration creates visible benefits, such as better grazing land, improved soil, jobs, food, water access, or income from restored plants. However, the project faces certain challenges. It needs long-term funding, local support, and stable governments. If local communities are not involved, projects may fail. Success depends on strong local participation.[172]

The World Bank is an international institution that helps to provide loans, grants, and support to developing countries.[173] It works to support land restoration through programs like Sahel RESILAND. This program focuses on restoring land, creating jobs, and building resilience in West Africa while linking restoration with peace and economic growth. It does this by combining environmental restoration with employment, strengthening local institutions, and improving management of natural resources. The program also creates restoration-related jobs and strengthens the ability of communities and governments to manage land. This is important because land damage can increase poverty and conflict. By improving land and livelihoods, programs like RESILAND help reduce these risks.[174]

Funding from donors is another key part of the response. Many affected countries face poverty, debt, or conflict. This makes it hard for them to finance large projects alone. Groups like the Global Environment Facility provide financial support to reduce and reverse land degradation. This funding can support soil restoration, better farming, water management, and training.[175] However, funding must also last for long periods of time. Land restoration takes time, and short-term projects may not succeed.

These organizations play related but distinct roles. The UNCCD provides the principal international framework for combating desertification, while the FAO focuses on agriculture, rural livelihoods, food systems,

technical assistance, and data. WFP may address immediate hunger and help communities strengthen resilience, while development banks finance larger infrastructure and restoration programs. National and local governments remain responsible for land and water policies, and community participation is necessary to ensure that projects reflect local livelihoods and land-use practices.

Further, local knowledge is key to combatting the issue of land degradation. People who live in dry areas often understand their land well. They know which plants survive drought, where water collects, and how animals graze. International programs work best when they combine scientific knowledge with local experience. This helps create solutions that are applicable in real communities. Projects are more likely to succeed when local people help design and manage them.[176]

Ultimately, international responses like policy agreements, goals, funding, and restoration projects can help combat desertification. Initiatives such as the UNCCD, LDN, Sustainable Development Goals, the Great Green Wall, and Sahel RESILAND show how land restoration can support jobs and communities. Finally, cooperation between countries, organizations, and local communities is essential to create solutions that work best for everyone.

Current Status

CURRENT GLOBAL SCALE OF LAND DEGRADATION AND DESERTIFICATION

Land degradation and desertification are closely connected, but they are not the same problem. Land degradation is the decline or loss of biodiversity, ecosystem functions, or the land's ability to support human needs.[177] Desertification is a specific form of land degradation that occurs in arid, semi-arid, and dry sub-humid regions because of climatic variations and human activities.[178] When land degradation occurs in dryland regions and becomes severe or persistent, it can contribute to desertification. Land can be degraded even when the damage is not immediately visible. For example, a field may appear to be healthy, but the soil may have a lack of nutrients and an inability to hold water, eroding the land quality.

The UNCCD found that 40 percent of the Earth's land was degraded in some way in 2022. This puts pressure on food supplies and economic growth, putting billions of people at risk. Land degradation is connected to issues that develop over long periods of time. Once the land is very damaged, the cost of restoring it can be much greater than the cost of addressing the problem earlier.[179]

Agriculture sits right in the middle of these issues. In 2025, the FAO reported that roughly 1.7 billion people live in places where human-driven land degradation has cut crop yields by at least 10 percent. These declines reduce food

The UNCCD found that 40 percent of the Earth's land was degraded in some way in 2022.

supplies while global demand continues to rise. Over time, lower yields can weaken household incomes, increase food prices, and reduce national food reserves. Small yield changes are manageable for short periods of time. But over time, they become dangerous when they line up with droughts, fertilizer costs, conflicts, debt, or ineffective transportation systems.[180] A UNCCD assessment found that 77.6 percent of the world's land became drier between 1991 and 2020, when compared with the previous 30-year period. Over the same time period, drylands grew by about 4.3 million square kilometers. They now cover 40.6 percent of the planet's land, excluding Antarctica.[181]

A drought is a temporary period of unusually low rainfall, while aridity is a lasting condition in which evaporation regularly exceeds rainfall. A region can bounce back from one bad drought year. However, it is much harder to bounce back from a climate that is permanently drier. This changes which crops can grow, where herds can graze, and how much water can safely be pulled from the ground.[182] Water stress worsens this situation. At least half of the global population deals with highly stressed water conditions for at least one month out of every year.[183] Because crop irrigation competes with households and factories for the same water resources, farming is especially vulnerable to water shortages. While pumping groundwater can help, doing it at a rate faster than it can replenish will cause the problem to worsen later.[184] Either way, the push to grow more food in the present can quietly wreck the land's ability to grow food in the future.

Land degradation also damages the soil and ecosystems that support agriculture. Healthy soil should store carbon and filter water. It also provides for the surrounding ecosystem. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services found that land productivity has fallen well below its natural potential across large stretches of the planet. This degradation has already cut into global plant productivity and soil carbon, affecting climate patterns and global warming. This matters for food security because the health of these ecosystems affects farmers, pastoralists, economies, and countries.[185]

While this is a burden, it is not shared evenly worldwide. Most rural households rely directly on rainfed farming, livestock, forests, or fishing. Most of them also have limited access to resources such as credit, insurance, irrigation, or secure land rights. This imbalance is pointed out in the FAO's 2025 analysis. These data show how most household farms are tiny compared to massive farms that control a disproportionate share of agricultural land. A large commercial operation can afford precision irrigation, or to absorb a bad harvest and move on. However, a small farmer cannot afford to leave a field unplanted, buy drought resistant tools, or wait several years for restored soil to pay itself off. Policies that do not address this gap tend to favor people who already have capital, leaving the most vulnerable farmers still struggling.[186]

The economic costs of drought are also increasing. The Organisation for Economic Co-operation and Development (OECD) estimates that drought-related losses have grown globally by somewhere between 3 and 7.5 percent per year since 2000. Even the more cautious projections say drought will get substantially more expensive by 2035.[187] Agriculture is typically impacted first, but the damage spreads. Food processing, transport, power generation, government budgets, and trade are all affected. A country that loses part of its harvest often has to import more food at exactly the moment rural incomes are falling. If several producing regions hit drought at the same time, global prices climb, and food-importing countries end up exposed on both sides. For rural households, lower harvests reduce income and make food harder to afford. Urban populations are also affected as shortages raise food prices, strain public budgets, and increase dependence on imports.[188]

The international community has responded through restoration commitments, land degradation neutrality targets, and international

funding programs. However, implementation remains uneven across countries. Governments have committed to restoring large areas of degraded land, and more than 100 countries have adopted voluntary land degradation neutrality targets. The Global Land Outlook argues that restoration can create jobs, improve water security, protect biodiversity, and strengthen food systems, but it also warns that restoration cannot replace prevention. Planting trees without protecting water supplies, land rights, or local livelihoods may produce impressive short-term numbers without lasting recovery. The most effective programs generally combine soil and water conservation, sustainable grazing, better farming practices, secure tenure, local participation, and monitoring over time.[189]

Therefore, the current global status is not simply that the world is running out of farmland. A growing share of land and water systems is becoming less dependable, right as food demand, climate pressure, and economic instability are all rising together. As food demand rises, addressing desertification and land degradation on a global scale becomes more important than ever.

CASE STUDY: THE SAHEL AND HORN OF AFRICA

The Sahel faces overlapping environmental, political, economic, and security crises. Military takeovers, armed conflicts, economic crises, and low agricultural output have caused widespread malnutrition and hunger.[190] In this region, around 8 million children under five years old suffer from malnutrition.[191] The World Food Programme (WFP) currently categorizes the conflict in the Sahel as a level three emergency. This is the highest level possible.[192] These overlapping conditions demonstrate that desertification does not produce hunger on its own. Its effects become more severe when conflict prevents farming, blocks trade routes, displaces communities, and limits humanitarian access.

The Sahel is a semi-arid region between the Sahara Desert and the wetter savannas to its south. Communities here have adapted to unreliable rainfall for generations. They move with the seasons, store grain, and share resources. However, environmental strain is now layered on top of conflict, displacement, high prices, weak public services, and blocked humanitarian access. Burkina Faso, Mali, Niger, and Chad comprise the Central Sahel. The World Food Programme reports that around 10 million people in the Central Sahel are facing acute hunger. It also estimates that 3.5 million people across Burkina Faso, Mali, and Nigeria are trapped in besieged or isolated areas, cut off from regular aid.[193]

WFP points to conflict, the climate crisis, tension between communities, falling agricultural output, and rising food and fuel prices as the main drivers of food insecurity. These factors often reinforce one another. A drought can wipe out a harvest, but political insecurity can stop farmers from planting in the first place. While food might be available sitting in a market, a displaced family may have neither the income nor a safe way to get there. As a result, nearly 18 million people in this region are on the brink of starvation.[194]

Mali faces a combination of conflict and environmental stress. A 2026 blockade by Jama'at Nusrat al-Islam wal-Muslimin (JNIM) provides an example of how insecurity can disrupt pastoral livelihoods and food access. In May, militants attacked vehicles and blocked major routes into Bamako, Mali, limiting the movement of livestock and other goods.[195] As fewer animals reached the capital before Eid al-Adha, sheep prices nearly doubled, making meat unaffordable for many households. The crisis demonstrates how armed groups can prevent livestock from reaching markets, reduce herders' incomes, and raise food costs for consumers even when animals and food remain available elsewhere in the country. FAO and WFP listed Mali among the hunger hotspots of highest concern in 2025, warning that conflict, high grain prices, and access restrictions were pushing some populations toward catastrophic conditions.[196]

Refugees from the Ali Hussein camp during a 2011 famine

Credit: Oxfam

Niger also faces unpredictable rainfall, poor soil fertility, and frequent droughts. To reduce their vulnerability, many households combine crop farming and livestock herding with migration and seasonal employment.[197] However, conflict can make roads and grazing routes unsafe, limiting families' ability to move livestock, reach markets, find work, or cultivate their land. According to WFP, low agricultural productivity, climate shocks, and unstable markets continue to increase food insecurity in Niger. Even when favorable rainfall improves the country's overall cereal harvest, conflict-affected communities may continue to experience hunger. Displaced families may miss the planting season or return to farmland that has not been maintained. Therefore, national harvest figures may conceal severe food insecurity in particular communities.[198]

Another country struggling with this issue is Chad, which links the Central Sahel to both the Lake Chad Basin and the war in Sudan. As a country, it already deals with land and water stress, thin infrastructure, and expensive transport. Chad has also recently started hosting large numbers of refugees and displaced people. Those arrivals put more pressure on water, grazing land, firewood, and services that were already stretched thin. Refugees are not the cause of desertification. However, a sudden jump in population can overwhelm governments and aid groups that cannot expand infrastructure and jobs fast enough to keep up. Food insecurity in the region is thus connected to both regional conflict and local farming conditions. This shows how environmental stress in one country can spread through migration, trade, humanitarian needs, and regional instability. It also demonstrates why land restoration must be paired with refugee support, infrastructure, and conflict prevention.[199]

Access to agricultural and food markets connects land degradation to hunger. Farmers depend on these markets to sell their products, purchase agricultural supplies, and obtain food when their own harvests are insufficient. Rural families may also sell crops or livestock to pay for medicine and other necessities. When environmental conditions change, fuel and fertilizer prices rise, or other unexpected disruptions occur, the resulting costs place additional pressure on both farmers and consumers. In 2026, the World Bank projected

that 52.8 million people across West and Central Africa could face acute food insecurity during the June to August lean season, with the Central Sahel and Lake Chad Basin among the hardest hit.[200] Although the region had produced a relatively strong harvest, the conflict, displacement, high food prices, and unequal access to markets prevented its benefits from reaching many vulnerable communities.

Similar conditions can be seen in the Horn of Africa. The Horn of Africa refers to the peninsula in Eastern Africa that projects into the Arabian Sea and Indian Ocean. Ethiopia, Somalia, and Kenya have all been through repeated droughts that wrecked crops and killed livestock, worsened by conflict and rising prices. The 2020 to 2023 droughts hit especially hard, and rain returning afterward did not instantly rebuild herds, erase debt, or send displaced families home.[201] Food security outcomes depend on exposure to climate hazards, but also on poverty, institutions, markets, conflict, and how much room people have to adapt.[202] A community's vulnerability, including its income, infrastructure, political stability, and ability to adapt, helps determine how severely climate pressures affect it.

Current responses increasingly try to combine immediate food assistance with longer-term resilience.[203] A 2026 WFP report on its Sahel Integrated Resilience Initiative provides a recent example from Doungoulou, Chad. The report examines a project that began in 2021, when community members worked with WFP and partners to construct a 6,000-meter dike that captures seasonal rainwater, replenishes groundwater, and supplies water for crops and livestock.[204] The community helped select the land, determine where water should be retained, and establish how the restored area would be managed. WFP reports that harvests on rehabilitated land increased from 0.5 to 2 metric tons per hectare.[205] Water points supplied by the project are also shared by farmers and herders, helping to reduce competition over scarce resources. The project operates alongside nutrition assistance, school meals, and livelihood support, showing how humanitarian assistance can address immediate hunger while strengthening communities' long-term resilience. However, such projects still depend on communities being able to access, manage, and remain on the restored land.

The current status of the Central Sahel is therefore a compound crisis. Desertification and drought reduce agricultural productivity and make rural livelihoods less secure. Conflict then prevents people from using the land, moving livestock, reaching markets, or receiving aid. High prices and weak infrastructure spread the damage beyond the places where rainfall failed. A serious response must address all parts of this chain. Restoring land is necessary, but it will not end hunger without security, market access, local governance, and protection for displaced people.[206] In the same way, emergency food aid can save lives, but it cannot create lasting food security if the land and livelihoods people depend on continue to decline.

Although dryland degradation is particularly severe in parts of Africa, it is not limited to one region. Countries in Central Asia, the Middle East, Latin America, South Asia, the Mediterranean, and Australia also face combinations of soil erosion, salinization, drought, groundwater depletion, and pressure on agricultural land. In Central Asia, countries across the region face soil erosion, declining soil fertility, salinization, overgrazing, and pressure on agricultural land caused by unsustainable farming practices and poorly maintained irrigation and drainage systems.[207] These problems can reduce agricultural productivity, weaken rural livelihoods, and threaten long-term food security. The specific causes of global desertification may differ, but desertification is a global food-security challenge.

Lake Chad as seen from Nigeria

Credit: Sani Ahmad Usman

CURRENT EFFORTS AND REMAINING IMPLEMENTATION GAPS

Governments and international organizations increasingly combine land restoration with water management, climate-resilient agriculture, infrastructure, and livelihood support. However, implementation remains uneven. Projects may receive short-term funding, lack local support, or struggle to operate in areas affected by conflict and weak institutions.[208] Examples from the Lake Chad Basin, Central Asia, and Latin America show that implementation gaps take different forms. Conflict and displacement may prevent projects from operating in some regions, while other regions struggle with cross-border coordination, limited institutional capacity, insufficient monitoring, or short-term funding.

The Lake Chad Basin illustrates the difficulty of implementing restoration and livelihood programs across areas affected by conflict. In 2020, the World Bank approved two operations totaling USD 346 million, including the Lake Chad Region Recovery and Development Project (PROLAC).[209] The funding supported PROLAC in Cameroon, Chad, and Niger, as well as a separate recovery project in northeastern Nigeria. Together, these operations support infrastructure, agricultural production, livelihoods, and natural-resource management. By 2025, the World Bank reported progress in several of these areas. However, conflict and restrictions on movement can still prevent farmers, herders, and fishers from reaching markets, water, grazing land, and restored areas.[210] Because people and resources move across borders while most government agencies operate nationally, implementation also requires cooperation among governments and local organizations.[211] PROLAC therefore demonstrates that major investments may produce infrastructure and other measurable results without guaranteeing that vulnerable communities can safely access or maintain them.[212]

Central Asia presents a different implementation challenge of coordinating restoration across borders. The World Bank's RESILAND program supports landscape restoration across Kazakhstan, the Kyrgyz Republic, Tajikistan, and Uzbekistan.[213] Projects include restoring forests and rangelands, planting drought-resistant trees, protecting riverbanks, reducing

landslide and flood risks, and developing shared approaches to ecosystems that cross national borders. Progress depends on governments coordinating policies, sharing environmental information, and maintaining projects over time. A 2025 review of Tajikistan's RESILAND project found improvements in water access, pasture management, farming, and local livelihoods. In one village, a new two-kilometer pipeline now irrigates 205 hectares of land. Other communities have created pasture-restoration areas, greenhouses, and beekeeping programs.[214] The project's review also included discussions about membership fees and equipment maintenance, showing the importance of planning for how local communities will maintain these systems over time.

Latin America demonstrates another gap between ambitious commitments and implementation. Initiative 20x20 brings together governments, financial institutions, and civil society organizations with the goal of restoring 50 million hectares of degraded land across Latin America and the Caribbean.[215] This regional commitment can attract investment and encourage countries to share restoration methods. However, announcing a restoration target does not guarantee that land has recovered. Initiative 20x20's 2024-2030 strategy calls for better monitoring systems to measure progress, more public and private financing, and greater participation by women, young people, Indigenous Peoples, and local communities.[216] The strategy also identifies funding gaps affecting monitoring and other parts of its work. This matters because the number of trees planted or hectares included in a program does not reveal whether vegetation survives, communities benefit, or ecosystems recover over time.

Across these regions, the strongest resilience strategies work at several levels at once: local, national, and regional. Local communities need real authority over where water points, restoration areas, grazing corridors, and livelihood projects go. National governments must provide stable funding, legal protections, and systems for monitoring whether restored land remains productive. Neighboring countries also need shared data, early-warning systems, and clear rules for managing water, rangelands, and ecosystems that cross borders. Local participation is equally important. Farmers, pastoralists, Indigenous Peoples, women, and young people often possess detailed knowledge of changing land and water conditions but may have little influence over where projects are placed or how resources are managed.[217]

These examples demonstrate that implementation gaps differ across regions. Conflict and unsafe movement constrain projects around Lake Chad, cross-border coordination and long-term maintenance affect restoration in Central Asia, and Latin American commitments require reliable monitoring to demonstrate lasting results. Governments and international organizations already recognize many possible solutions, but successful implementation depends on stable financing, local participation, continued maintenance, and accountability. Restoration programs must therefore be judged not only by the projects they begin, but also by whether their environmental and social benefits continue after outside support ends.

Bloc Analysis

POINTS OF DIVISION

The disagreement among countries on this topic focuses on how limited funding and resources should be divided among land restoration, water security, food production, and rural livelihoods. Some countries prioritize restoring damaged land and protecting the communities that depend on it. These countries tend to support soil conservation, sustainable grazing, agroforestry, and locally led restoration. Others may argue that governments must first protect crop yields and national food supplies through irrigation, agricultural technology, and drought-resistant

crops.

A second division concerns the role of technology in addressing water and food insecurity. Countries that have large populations, agricultural sectors, dry climates, or a heavy dependence on irrigation worry about keeping crop yields steady as rainfall becomes less predictable. They usually support efficient irrigation systems, drought-resistant crops, water monitoring, crop insurance, and climate-smart farming practices. Critics warn that technology-centered programs may benefit large agricultural producers while excluding small farmers who cannot afford new equipment, obtain credit, or access technical training. This creates a larger debate over whether funding should prioritize advanced technology or affordable, community-based methods that small-scale farmers can use and maintain.[218]

Another major disagreement focuses on sources of funding. Lower-income countries that are especially vulnerable to climate change argue that higher-income states, development banks, and international organizations have a responsibility to step in with grants and technical support. Donor countries are often willing to help, but they usually require proper financial oversight. Countries also do not always agree on what form this support should take, whether that means grants, loans, private investment, or forgiving existing debt. Donor and recipient countries may also disagree over how much control funders should have over project design, reporting requirements, and evaluations of success.[219]

All of these points of division are interconnected. Some countries prioritize local land rights and community-led restoration, while others emphasize crop yields, water efficiency, international financing, or technological innovation. Most countries will find that they agree with pieces of every approach.[220] Delegates must therefore decide which programs should receive priority, who should finance them, how success should be measured, and how solutions can reach small farmers and pastoralists without weakening food production.

COUNTRIES FOCUSED ON LAND RESTORATION AND RURAL LIVELIHOODS

This bloc includes countries that prioritize restoring degraded land and protecting rural livelihoods first. Members include sub-Saharan African countries like Mali, Senegal, and Niger. The bloc's core argument is that emergency food aid alone cannot fix desertification. Long-term investment is needed to restore soil health, regenerate vegetation, improve water retention, and create income for farmers and herders.[221]

Members of this bloc favor community-led restoration, agroforestry, and farmer-managed natural regeneration. They are likely to push back on plans that are designed without local participation, weaken customary land rights, or replace workable local practices with expensive imported technologies. The African Union's updated Great Green Wall Strategy supports a broader approach than simply planting a line of trees.[222] It emphasizes community-led land restoration and regenerative agriculture.

The bloc's core argument is that emergency food aid alone cannot fix desertification.

The bloc would use this model to argue that projects should be designed collaboratively with villages, pastoral groups, women, and local governments. They would not be opposed to water monitoring and climate-smart practices, but these approaches would need to be feasible for small-scale farmers who may need to combine local knowledge with appropriate new practices. These same countries often push back against programs that lean too heavily on expensive technology or broad national targets.[223] Technology can be expensive, require maintenance, depend on infrastructure that rural communities lack, and ignore local methods of farming. Certain technologies may also create environmental risks or increase farmers' dependence on outside suppliers.

Members would also support funding that lasts long enough for restored land to become productive and for local institutions to maintain it. Countries would retain flexibility to choose methods suited to their rainfall, soils, land-tenure systems, and pastoral traditions. The World Bank's Sahel RESILAND program connects ecosystem restoration with jobs, governance, climate-resilient farming, pastoralism, and conflict reduction.[224] Based on that approach, this bloc might favor grants and low-cost financing for water harvesting, plant nurseries, extension services, local land agreements, and maintenance after construction. It would resist evaluating projects only by the number of hectares treated or profits generated. Instead, success would be judged through soil health, water availability, crop and livestock productivity, household income, lower conflict over resources, and whether communities continue protecting the land after outside support ends.[225]

However, critics may argue that locally led projects are difficult to expand, take years to produce measurable results, and may not increase food production quickly enough to meet immediate national needs.

COUNTRIES FOCUSED ON WATER SECURITY AND FOOD PRODUCTION

This bloc includes countries that prioritize maintaining food and water supplies, especially as their populations grow. Members include India, Pakistan, Egypt, Mexico, Brazil, South Africa, and Australia. This is a diverse group in terms of income and political influence, but it is united by large agricultural sectors, water-stressed farming regions, or heavy reliance on irrigation. While land restoration matters to them, these countries need practical ways to maintain food production during droughts and periods of severe water stress.[226]

The bloc supports measures such as repairing leaking canals, soil-moisture monitoring, drought-resistant seeds, crop diversification, treated-water reuse, and better weather and early-warning services. It would also push for water accounting so governments know who is withdrawing water and whether aquifers are being depleted. The World Resources Institute finds that about 60 percent of irrigated crop production is already located in areas of high or extremely high water stress. Ten countries produce 72 percent of global irrigated crops, and two-thirds of those crops face high or extremely high stress.[227] These states would argue that water policy is directly connected to both national and global food security.

Members would promote climate-smart agriculture, but they would likely prefer flexibility instead of one universal model. The World Bank defines climate-smart agriculture around increasing productivity, strengthening resilience, and reducing emissions where possible.[228] In negotiations, this bloc would likely support research partnerships, farmer training, crop insurance, digital forecasting, and technology transfer. Critics may argue that this approach places national production targets above ecosystem health and that expensive technologies may primarily benefit commercial farms rather than small producers. To address these concerns, the bloc may combine efficient

technology with water-withdrawal limits, groundwater monitoring, affordable credit, and financial protection for small farmers. Such support could prevent farmers from carrying the full cost when new technologies are unaffordable or initially unsuccessful.[229]

COUNTRIES FOCUSED ON INTERNATIONAL FUNDING AND TECHNOLOGY

This bloc focuses on international financing, monitoring, and technology transfer. It may include higher-income donors and technology-producing states such as the United States, South Korea, the United Kingdom, the United Arab Emirates, and European Union member states. Countries with extensive restoration experience, including Morocco and Costa Rica, may support parts of this approach while also seeking international financing for their own programs. However, they do not form a fixed coalition and may disagree over the amount, form, and conditions of international assistance. Some members may bring large amounts of financing and technology. Others may bring restoration experience, regional leadership, or working policy models. They recognize that desertification is a global food-security risk, and vulnerable countries should not be expected to bear the financial burden alone.[230]

Some proposals include a larger international restoration fund, debt-sensitive financing, grants for least-developed and conflict-affected states, satellite monitoring, open climate data, technical training, and stronger early-warning systems. The European Union's Soil Strategy for 2030 calls for sustainable soil management, restoration of degraded soils, and mobilization of resources, showing how donor states can connect domestic soil policy with international commitments.[231] The coalition would also encourage development banks and private investors to support projects that have clear social and environmental safeguards.

Accountability would be a central part of this bloc's platform. Because financing requires measuring effectiveness, members would push for evidence-based outcomes, public reporting, and community consultation before funding is renewed. It would also support heavily affected countries as they develop stronger land policies, humanitarian plans, and crop-insurance systems. Member countries would also push for stable trade so a drought in one region does not automatically spiral into a wider food-price crisis or push vulnerable countries into unsustainable emergency borrowing.[232] Recipient countries may criticize this approach if loans increase their debt burdens, donor requirements limit national or local control, or monitoring systems measure outcomes without reflecting community priorities.

Committee Mission

The FAO works to make agriculture and food systems more efficient, inclusive, resilient, and sustainable. Desertification falls within this mission because degraded soil, water scarcity, and the loss of grazing land can reduce food production, weaken rural livelihoods, and make nutritious food less accessible. The FAO's mission is to help countries build food systems that work long-term. This includes being more efficient, fair, resilient, and sustainable. Its Strategic Framework for 2022 to 2031 focuses on improving production, nutrition, environment, and life.[233] This connects directly to the issues of this topic. When considering farming practices, nutritional support for populations, and more stable food systems, this ultimately connects to the health and stability of the food produced from land. Soil loses quality, water becomes harder to access, crop yields drop, livestock lose grazing land, and rural families often lose their main source of income if lands are not maintained and protected.[234]

In this committee, delegates should treat these issues as more than just environmental. They should have an understanding that they are

linked to food security, poverty, and development. The FAO does not have the power to stop conflicts or force countries to change their land policies, but it can encourage policies, create frameworks, and advise countries.[235] The goal of the FAO is to support countries in making more responsible decisions for people, farmers, and the environment. If land is supported, food and livestock can thrive, and so can the populations that depend on them.[236] The FAO can develop voluntary guidelines, coordinate research, strengthen national institutions, expand early-warning systems, support demonstration projects, and connect governments with technical and financial partners. Proposals should therefore remain within the FAO's advisory and capacity-building mandate.

Sustainable agriculture should remain at the center of the committee's work. Delegates must balance immediate food-production needs with the long-term protection of soil and water. They should also recognize that countries have different climates, agricultural systems, financial resources, and technical capacities.[237] A policy that succeeds in one region may be unaffordable or environmentally inappropriate in another.

Delegates should develop realistic and affordable proposals addressing land restoration, water management, climate-resilient agriculture, support for farmers and pastoralists, international financing, technology transfer, and long-term monitoring. They should determine how programs will reach vulnerable communities, how success will be measured, and how projects can continue after international funding ends.

Research and Preparation Questions

Your dais has prepared the following research and preparation questions as a means of providing guidance for your research process. These questions should be carefully considered, as they embody some of the main critical thought and learning objectives surrounding your topic.

TOPIC A

1. Which pollinators are most important to your country's ecosystems and agricultural production, and what evidence exists about their current population trends?
2. What are the primary drivers of pollinator decline in your country, and how do its agricultural practices, land-use policies, climate conditions, or invasive species contribute to these pressures?
3. Does your country have a national pollinator strategy, pesticide regulations, habitat-restoration programs, or incentives for pollinator-friendly farming? How effective have these measures been?
4. How should governments balance pollinator protection with agricultural productivity, farmer livelihoods, food security, and access to effective pest-management tools?
5. What financial, scientific, or technical barriers limit pollinator conservation and monitoring in your country? What assistance could the FAO or other international partners provide?

TOPIC B

1. In your country, what are the main causes of desertification and land degradation? Which regions or communities are most affected?
2. How have water scarcity and land degradation affected food production, prices, and agricultural livelihoods in your country?
3. What kinds of policies does your country have towards desertification? Have these policies been successful?
4. How can proposed solutions ensure small-scale farmers are supported with the needed resources to adapt to land degradation? What funding, technology, or additional training might they need?
5. How can previous and current international programs and agreements, such as the UNCCD, Land Degradation Neutrality, and the Great Green Wall, be improved to produce more effective results?
6. How should countries balance the immediate need to increase food production with the long-term need to protect soil, water, and agricultural land?
7. How can desertification and food insecurity be addressed in regions where conflict, displacement, weak governments, or limited market access make land restoration programs difficult to implement?

Important Documents

TOPIC A

Convention on Biological Diversity. Updated Plan of Action 2018–2030 for the International Initiative on the Conservation and Sustainable Use of Pollinators. Montreal: Secretariat of the Convention on Biological Diversity, 2018. CBD/COP/DEC/14/6, Annex I. https://www.cbd.int/international-pollinators-initiative/2025/plan-of-action.

Dicks, Lynn V., et al. "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline." Nature Ecology & Evolution 5 (2021): 1453–1461. https://doi.org/10.1038/s41559-021-01534-9.

Frontiers in Ecology and the Environment 12, no. 8 (2014): 439–447. https://doi.org/10.1890/130330.

Garibaldi, Lucas A., et al. "From Research to Action: Enhancing Crop Yield Through Wild Pollinators."

Høye, Toke T., et al. "Emerging Technologies for Pollinator Monitoring." Current Opinion in Insect Science 69 (2025): 101367. https://doi.org/10.1016/j.cois.2025.101367.

Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production. Edited by Simon G. Potts et al. Bonn: Secretariat of IPBES, 2016. https://www.ipbes.net/assessment-reports/pollinators.

National Biodiversity Data Centre. All-Ireland Pollinator Plan 2026–2030. Waterford: National Biodiversity Data Centre, 2026. https://pollinators.ie/about/aipp2026-2030/.

Potts, Simon G., et al. "Safeguarding Pollinators and Their Values to Human Well-Being." Nature 540 (2016): 220–229. https://doi.org/10.1038/nature20588.

TOPIC B

African Union. African Union Great Green Wall Initiative Strategy and Ten-Year Implementation Framework: Enhancing Ecosystems Restoration and Livelihoods Resilience, 2024–2034. Addis Ababa: African Union Commission, 2024. https://au.int/en/documents/20240530/african-union-great-green-wall-initiative-strategy-and-ten-year-implementation.

Food and Agriculture Organization of the United Nations. The State of Food and Agriculture 2025: Addressing Land Degradation Across Landholding Scales. Rome: FAO, 2025. https://doi.org/10.4060/cd7067en.

Food and Agriculture Organization of the United Nations. "FAO Strategic Framework 2022–31." Accessed June 6, 2026. https://www.fao.org/strategic-framework/en.

Intergovernmental Panel on Climate Change. "Chapter 5: Food Security." In Climate Change and Land. Geneva: IPCC, 2019. https://www.ipcc.ch/srccl/chapter/chapter-5/.

United Nations Convention to Combat Desertification. Global Land Outlook 2: Land Restoration for Recovery and Resilience. Bonn: UNCCD, 2022. https://www.unccd.int/resources/global-land-outlook/glo2.

United Nations Convention to Combat Desertification. United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa. Bonn: UNCCD, 1994. https://www.unccd.int/resource/convention-text.

About the Authors

TOPIC A: POLLINATOR PARTNERSHIP

Pollinator Partnership is the world's largest nonprofit organization dedicated exclusively to conserving pollinators and the ecosystems that support them. Since 1997, the organization has advanced pollinator health through science-based conservation, research, education, and collaboration. Working with governments, businesses, researchers, farmers, land managers, and communities, Pollinator Partnership develops practical solutions that support pollinators, biodiversity, sustainable agriculture, and food security across North America and beyond. Pollinator Partnership has also provided scientific and policy expertise that has informed major national and international pollinator conservation initiatives. Signature initiatives include the North American Pollinator Protection Campaign (NAPPC), National Pollinator Week, Bee Friendly Farming, Pollinator Steward Certification, Project Wingspan, and the Ecoregional Planting Guides.

Bee Redfield is an ecologist whose work focuses on pollinator conservation, habitat restoration, and environmental education. She has developed conservation programs and partnerships across North America and has extensive experience translating scientific research into educational resources for diverse audiences. **Lora Morandin, PhD,** is a conservation ecologist whose work over the past three decades has focused on integrating biodiversity conservation and ecosystem services into human-dominated landscapes. She has partnered with governments, industry, farmers, conservation organizations, and communities to advance pollinator conservation through research, policy, education, and on-the-ground conservation. She is a National Geographic Explorer and has authored numerous peer-reviewed scientific publications, technical guides, and educational resources, and has helped thousands of people better understand and conserve pollinators and biodiversity through research, outreach, and training. **Vicki Wojcik, PhD,** is a conservation ecologist who has worked on pollinator ecosystems for over 20 years. Her work aims to understand how pollinators interact with natural and modified habitats, including their responses to environmental change, and has focused on farmscapes, urban areas, and more recently Arctic ecosystems, in each case working with community members and stakeholders to improve outcomes for pollinators. Her work has seen impressions in peer-reviewed journals, books, community-based publications, and on social media platforms.

TOPIC B: DANIEL BASELEWS

Daniel Baselews is an undergraduate at the University of California, Los Angeles, where he studies business economics. Born in Egypt, Daniel moved to California at the age of five and has lived there ever since. He first became involved in Model United Nations as a freshman in high school and has remained active in MUN throughout high school and college, participating as both a delegate and staff member. Over the years, MUN has given him the opportunity to compete at conferences, take on leadership roles, and develop a strong interest in international affairs and collaborative problem-solving. Outside of MUN and school, Daniel is involved with Bruin Strategy Network, UCLA's premier consulting club, volunteers with UCLA Health, and works at In-N-Out Burger. He is excited to pursue dental school in the years following his bachelor's degree.

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Endnotes

1 Hill, R., et al. (2020), Working with Indigenous, local and scientific knowledge in assessments of nature and nature's linkages with people, Current Opinion in Environmental Sustainability, 43, 8–20; Tengö, M., et al. (2014), Connecting diverse knowledge systems for enhanced ecosystem governance: The Multiple Evidence Base approach, AMBIO, 43, 579–591.
2 Ollerton, J., Winfree, R., & Tarrant, S, (2011), How many flowering plants are pollinated by animals? Oikos, 120(3), 321–326.
3 The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production, prepared by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (Bonn: Secretariat of IPBES, 2016); Simon G. Potts et al., "Safeguarding Pollinators and Their Values to Human Well-Being," Nature 540 (2016): 220–229.
4 IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Potts et al., "Safeguarding Pollinators and Their Values to Human Well-Being,."
5 IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Potts et al., "Safeguarding Pollinators and Their Values to Human Well-Being,."
6 Alexandra-Maria Klein et al., "Importance of Pollinators in Changing Landscapes for World Crops," Proceedings of the Royal Society B: Biological Sciences 274, no. 1608 (2007): 303–313.
7 Klein et al., "Importance of Pollinators in Changing Landscapes for World Crops."; Simon G. Potts et al., "Safeguarding Pollinators and Their Values to Human Well-Being," Nature 540 (2016): 220–229.
8 IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Klein et al., "Importance of Pollinators in Changing Landscapes for World Crops."
9 IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Potts et al., "Safeguarding Pollinators and Their Values to Human Well-Being,."
10 IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Potts et al., "Safeguarding Pollinators and Their Values to Human Well-Being,."
11 Potts et al., "Safeguarding Pollinators and Their Values to Human Well-Being."
12 Potts et al., "Safeguarding Pollinators and Their Values to Human Well-Being."
13 Lucas A. Garibaldi et al., "Stability of Pollination Services Decreases with Isolation from Natural Areas Despite Honey Bee Visits," Ecology Letters 14, no. 10 (2011): 1062–1072; Lucas A. Garibaldi et al., "Wild Pollinators Enhance Fruit Set of Crops Regardless of Honey Bee Abundance," Science 339, no. 6127 (2013): 1608–1611.
14 Lucas A. Garibaldi et al., "From Research to Action: Enhancing Crop Yield Through Wild Pollinators," Frontiers in Ecology and the Environment 12, no. 8 (2014): 439–447; Potts et al., "Safeguarding Pollinators and Their Values to Human Well-Being."
15 Victoria A. Wojcik et al., "Floral Resource Competition Between Honey Bees and Wild Bees: Is There Clear Evidence and Can We Guide Management and Conservation?" Environmental Entomology 47, no. 4 (2018): 822–833.
16 Ben A. Woodcock et al., "Meta-Analysis Reveals That Pollinator Functional Diversity and Abundance Enhance Crop Pollination and Yield," Nature Communications 10 (2019): 1481.
17 IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Lynn V. Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline," Nature Ecology & Evolution 5 (2021): 1453–1461.
18 IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Potts et al., "Safeguarding Pollinators and Their Values to Human Well-Being,."
19 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
20 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
21 Lynn V. Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline," Nature Ecology & Evolution 5 (2021): 1453–1461; IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Potts et al., "Safeguarding Pollinators and Their IPBES Values to Human Well-Being."
22 Nigel E. Raine and Maj Rundlöf, "Pesticide Exposure and Effects on Non-Apis Bees," Annual Review of Entomology 69 (2024): 551–576; Simone Tosi et al., "Lethal, Sublethal, and Combined Effects of Pesticides on Bees: A Meta-Analysis and New Risk Assessment Tools," Science of the Total Environment 844 (2022): 156857.
23 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
24 IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Potts et al., "Safeguarding Pollinators and Their Values to Human Well-Being,."
25 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
26 Garibaldi et al., "Stability of Pollination Services Decreases with Isolation from Natural Areas Despite Honey Bee Visits."
27 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
28 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" Garibaldi et al., "From Research to Action: Enhancing Crop Yield Through Wild Pollinators;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Tharaka S. Priyadarshana et al., "Crop and Landscape Heterogeneity Increase Biodiversity in Agricultural Landscapes: A Global Review and Meta-Analysis," Ecology Letters 27 (2024): e14412.
29 Garibaldi et al., "From Research to Action: Enhancing Crop Yield Through Wild Pollinators."
30 Garibaldi et al., "From Research to Action: Enhancing Crop Yield Through Wild Pollinators;" Woodcock et al., "Meta-Analysis Reveals That Pollinator Functional Diversity and Abundance Enhance Crop Pollination and Yield."
31 "Conservation Reserve Program (CRP)," U.S. Department of Agriculture Farm Service Agency, 2025, www.fsa.usda.gov/resources/conservation/conservation-reserve-program.
32 P. Basu et al., "Pesticide Impacts on Insect Pollinators: Current Knowledge and Future Research Challenges," Science of the Total Environment 954 (2024): 176656; Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
33 IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators,

Pollination and Food Production; Nigel E. Raine and Maj Rundlöf, "Pesticide Exposure and Effects on Non-Apis Bees," Annual Review of Entomology 69 (2024): 551–576.
34 Boyle et al., "Workshop on Pesticide Exposure Assessment Paradigm for Non-Apis Bees: Foundation and Summaries;" Raine and Rundlöf, "Pesticide Exposure and Effects on Non-Apis Bees."
35 Tosi et al., "Lethal, Sublethal, and Combined Effects of Pesticides on Bees."
36 Raine and Rundlöf, "Pesticide Exposure and Effects on Non-Apis Bees;" Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" Tosi et al., "Lethal, Sublethal, and Combined Effects of Pesticides on Bees."
37 "A New Deal for Pollinators," European Commission, 2023, environment.ec.europa.eu/topics/nature-and-biodiversity/pollinators_en.
38 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
39 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Silvia Martén-Rodríguez et al., "Untangling the Complexity of Climate Change Effects on Plant Reproductive Traits and Pollinators: A Systematic Global Synthesis," Global Change Biology 31 (2025): e70081.
40 Maxence Gérard et al., "Global Warming and Plant-Pollinator Mismatches," Emerging Topics in Life Sciences 4 (2020): 77–86; Potts et al., "Safeguarding Pollinators and Their Values to Human Well-Being."
41 Martén-Rodríguez et al., "Untangling the Complexity of Climate Change Effects on Plant Reproductive Traits and Pollinators; Gérard et al., "Global Warming and Plant-Pollinator Mismatches."
42 Martén-Rodríguez et al., "Untangling the Complexity of Climate Change Effects on Plant Reproductive Traits and Pollinators; Gérard et al., "Global Warming and Plant-Pollinator Mismatches."
43 Claire Descamps, Muriel Quinet, and Anne-Laure Jacquemart, "The Effects of Drought on Plant-Pollinator Interactions: What to Expect?" Environmental and Experimental Botany 182 (2021): 104297.
44 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" Gérard et al., "Global Warming and Plant-Pollinator Mismatches."
45 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline.
46 Gérard et al., "Global Warming and Plant-Pollinator Mismatches."
47 Martén-Rodríguez et al., "Untangling the Complexity of Climate Change Effects on Plant Reproductive Traits and Pollinators; IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Potts et al., "Safeguarding Pollinators and Their Values to Human Well-Being."
48 Martén-Rodríguez et al., "Untangling the Complexity of Climate Change Effects on Plant Reproductive Traits and Pollinators; Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;"
49 Amber L. Warner et al., "A Scoping Review on the Effects of Varroa destructor on Global Honey Bee Decline," Science of the Total Environment 906 (2024): 167492; Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline."
50 Scott H. McArt, Hauke Koch, Rebecca E. Irwin, and Lynn S. Adler, "Arranging the Bouquet of Disease: Floral Traits and the Transmission of Plant and Animal Pathogens," Ecology Letters 17, no. 5 (2014): 624–636; Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" Potts et al., "Safeguarding Pollinators and Their Values to Human Well-Being."
51 Peter Graystock et al., "Dominant Bee Species and Floral Abundance Drive Parasite Temporal Dynamics in Plant-Pollinator Communities," Nature Ecology & Evolution 4, no. 10 (2020): 1358–1367; Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; McArt et. al., "Arranging the Bouquet of Disease: Floral Traits and the Transmission of Plant and Animal Pathogens."
52 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" Graystock et al., "Dominant Bee Species and Floral Abundance Drive Parasite Temporal Dynamics in Plant-Pollinator Communities."
53 "Biosecurity," New Zealand Ministry for Primary Industries, 2025, www.mpi.govt.nz/biosecurity/.
54 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline." ; IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
55 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" Potts et al., "Safeguarding Pollinators and Their Values to Human Well-Being."
56 Adam J. Vanbergen, Anahí Espíndola, and Marcelo A. Aizen, "Risks to Pollinators and Pollination from Invasive Alien Species," Nature Ecology & Evolution 2 (2018): 16–25.
57 Stéphanie Guenat and Martin Dallimer, "A Global Meta-Analysis Reveals Contrasting Impacts of Air, Light, and Noise Pollution on Pollination," Ecology and Evolution (2023); IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production;
58 Guenat and Dallimer, "A Global Meta-Analysis Reveals Contrasting Impacts of Air, Light, and Noise Pollution on Pollination;" Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;"
59 IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Potts et al., "Safeguarding Pollinators and Their Values to Human Well-Being,."
60 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline." ; IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
61 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline." ; IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
62 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" Garibaldi et al., "From Research to Action: Enhancing Crop Yield Through Wild Pollinators;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production;
63 Hannah E. Payne, Susan J. Mazer, and Katja C. Seltmann, "Native Bee Habitat Restoration: Key Ecological Considerations from Recent North American Literature," Frontiers in Ecology and Evolution 12 (2024): 1358621; Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production;
64 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline." ; IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
65 Garibaldi et al., "From Research to Action: Enhancing Crop Yield Through Wild Pollinators;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production;
66 "Payment of Environmental Services," Fondo Nacional de Financiamiento Forestal, n.d., www.fonafifo.go.cr/en/servicios/pago-de-servicios-

ambientales/.
67 Payne, Mazer, and Seltmann, "Native Bee Habitat Restoration: Key Ecological Considerations from Recent North American Literature."
68 Hill, R., et al. Working with Indigenous, local and scientific knowledge;" Tengö, M., et al., "Connecting diverse knowledge systems for enhanced ecosystem governance."
69 Indigenous and Local Knowledge Practices for Pollinator Conservation and Sustainable Land Management in Eburu Ecosystem, Kenya, prepared by the Kenya National Trialogue and Eburu Communities (Nairobi: National Museums of Kenya, 2024).
70 Rebecca K. Tonietto and Daniel J. Larkin, "Habitat Restoration Benefits Wild Bees: A Meta-Analysis," Journal of Applied Ecology 55 (2018): 582–590.
71 Jessica Ulrich and Risa D. Sargent, "Habitat Restorations in an Urban Landscape Rapidly Assemble Diverse Pollinator Communities That Persist," Ecology Letters 28 (2025): e70037.
72 Klein et al., "Importance of Pollinators in Changing Landscapes for World Crops."; IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Land Statistics 2001–2023: Global, Regional and Country Trends, prepared by the Food and Agriculture Organization of the United Nations (Rome: Food and Agriculture Organization of the United Nations, 2025), FAOSTAT Analytical Brief No. 107.
73 Lynn V. Dicks et al., "Ten Policies for Pollinators," Science 354, no. 6315 (2016): 975–976; Garibaldi et al., "From Research to Action: Enhancing Crop Yield Through Wild Pollinators;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
74 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline." ; IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
75 Lora A. Morandin and Claire Kremen, "Hedgerow Restoration Promotes Pollinator Populations and Exports Native Bees to Adjacent Fields," Ecological Applications 23, no. 4 (2013): 829–839; Lora A. Morandin, Rachael F. Long, and Claire Kremen, "Pest Control and Pollination Cost-Benefit Analysis of Hedgerow Restoration in a Simplified Agricultural Landscape," Journal of Economic Entomology 109, no. 3 (2016): 1020–1027.
76 Priyadarshana et al., "Crop and Landscape Heterogeneity Increase Biodiversity in Agricultural Landscapes."
77 Hill, R., et al. Working with Indigenous, local and scientific knowledge;" Tengö, M., et al., "Connecting diverse knowledge systems for enhanced ecosystem governance."
78 Estrategia Nacional para la Conservación y Uso Sustentable de los Polinizadores (ENCUSP), prepared by the Secretaría de Agricultura y Desarrollo Rural, Secretaría de Medio Ambiente y Recursos Naturales, Servicio Nacional de Sanidad, Inocuidad y Calidad Agroalimentaria, Comisión Nacional para el Conocimiento y Uso de la Biodiversidad, and Comisión Nacional de Áreas Naturales Protegidas (Mexico City: Gobierno de México, 2021), www.gob.mx/agricultura/documentos/estrategia-nacional-para-la-conservacion-y-uso-sustentable-de-los-polinizadores-encusp.
79 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Potts et al., "Safeguarding Pollinators and Their Values to Human Well-Being,."
80 Basu et al., "Pesticide Impacts on Insect Pollinators: Current Knowledge and Future Research Challenges;" Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;"
IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Raine and Rundlöf, "Pesticide Exposure and Effects on Non-Apis Bees."
81 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline." ; IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
82 Hill, R., et al. Working with Indigenous, local and scientific knowledge;" Tengö, M., et al., "Connecting diverse knowledge systems for enhanced ecosystem governance."
83 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline." ; IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
84 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline." ; IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
85 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" Toke T. Høye et al., "Emerging Technologies for Pollinator Monitoring," Current Opinion in Insect Science 69 (2025): 101367.
86 Uddhav Dyola et al., "Community Structure of Pollinating Insects and Its Driving Factors in Different Habitats of Shivapuri-Nagarjun National Park, Nepal," Ecology and Evolution 12, no. 3 (2022): e8653.
87 Høye et al., "Emerging Technologies for Pollinator Monitoring."
88 Høye et al., "Emerging Technologies for Pollinator Monitoring."
89 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" Garibaldi et al., "From Research to Action: Enhancing Crop Yield Through Wild Pollinators."
90 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" Høye et al., "Emerging Technologies for Pollinator Monitoring."
91 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
92 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
93 Kunming-Montreal Global Biodiversity Framework, prepared by the Convention on Biological Diversity (Montreal: Secretariat of the Convention on Biological Diversity, 2022), CBD/COP/DEC/15/4.
94 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Plan of Action 2018–2030 for the International Initiative for the Conservation and Sustainable Use of Pollinators, prepared by the Convention on Biological Diversity (Montreal: Secretariat of the Convention on Biological Diversity, 2018), CBD/COP/DEC/14/6, Annex I.
95 All-Ireland Pollinator Plan 2026–2030, prepared by the National Biodiversity Data Centre (Waterford: National Biodiversity Data Centre, 2025), pollinators.ie/about/aipp2026-2030/.
96 National Strategy to Promote the Health of Honey Bees and Other Pollinators, prepared by the Pollinator Health Task Force (Washington, DC: Executive Office of the President of the United States, 2015), obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/Pollinator%20Health%20Strategy%202015.pdf.
97 Plan national en faveur des insectes pollinisateurs et de la pollinisation 2021–2026 [National Plan for Pollinating Insects and Pollination 2021–2026], prepared by the French Ministry for Ecological Transition (Paris: Government of France, 2021).
98 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline." ; IPBES, The Assessment Report of

the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
99 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline." ; IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
100 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline." ; IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
101 Sydney A. Cameron et al., "Patterns of Widespread Decline in North American Bumble Bees," Proceedings of the National Academy of Sciences 108, no. 2 (2011): 662–667.
102 Laura M. Guzman et al., "Impact of Pesticide Use on Wild Bee Distributions Across the United States," Nature Sustainability 7, no. 10 (2024): 1324–1334.
103 Collin B. Edwards et al., "Rapid Butterfly Declines Across the United States During the 21st Century," Science 387, no. 6738 (2025): 1090–1094.
104 Tara Cornelisse et al., "Elevated Extinction Risk in Over One-Fifth of Native North American Pollinators," Proceedings of the National Academy of Sciences 122, no. 14 (2025): e2418742122.
105 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Edwards et al., "Rapid Butterfly Declines Across the United States During the 21st Century."
106 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline." ; IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
107 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" Høye et al., "Emerging Technologies for Pollinator Monitoring."
108 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" Garibaldi et al., "From Research to Action: Enhancing Crop Yield Through Wild Pollinators;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production;
109 All-Ireland Pollinator Plan 2026–2030, prepared by the National Biodiversity Data Centre.
110 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" Garibaldi et al., "From Research to Action: Enhancing Crop Yield Through Wild Pollinators."
111 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline." ; IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
112 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" Garibaldi et al., "From Research to Action: Enhancing Crop Yield Through Wild Pollinators;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production.
113 Hill, R., et al. Working with Indigenous, local and scientific knowledge;" Tengö, M., et al., "Connecting diverse knowledge systems for enhanced ecosystem governance."
114 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline." ; IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Plan of Action 2018–2030 for the International Initiative for the Conservation and Sustainable Use of Pollinators, prepared by the Convention on Biological Diversity.
115 Juliana Hipólito, Carmen Sílvia Soares Pires, Jeferson Gabriel da Encarnação Coutinho, and Braulio Ferreira de Souza Dias, "Pollinator-Friendly Policies in Brazil: History and Future Directions," Neotropical Entomology 55, no. 28 (2026), doi.org/10.1007/s13744-025-01355-6
116 Dicks et al., "A Global-Scale Expert Assessment of Drivers and Risks Associated with Pollinator Decline;" IPBES, The Assessment Report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on Pollinators, Pollination and Food Production; Plan of Action 2018–2030 for the International Initiative for the Conservation and Sustainable Use of Pollinators, prepared by the Convention on Biological Diversity.
117 "Water Scarcity," Encyclopaedia Britannica, accessed August 17, 2026, https://www.britannica.com/topic/water-scarcity.
118 "Hazard Information Profiles," United Nations Office for Disaster Risk Reduction (UNDRR), accessed August 17, 2026, https://www.undrr.org/understanding-disaster-risk/terminology/hips/en0301.
119 Marlena Chertock, "Aqueduct Food," World Resources Institute, January 28, 2021, https://www.wri.org/data/aqueduct-food.
120 "Desertification," Encyclopaedia Britannica, accessed June 6, 2026, https://www.britannica.com/science/desertification.
121 Samantha Kuzma, Liz Saccoccia, and Marlena Chertock, "25 Countries, Housing One-Quarter of the Population, Face Extremely High Water Stress," World Resources Institute, August 16, 2023, https://www.wri.org/insights/highest-water-stressed-countries.
122 "Land and Food Security," World Bank, March 31, 2014, https://www.worldbank.org/en/topic/agriculture/brief/land-and-food-security.
123 United Nations Convention to Combat Desertification, "Article 1: Use of Terms," accessed June 6, 2026, Global Environment Facility, Land Degradation, accessed June 28, 2026, https://www.unccd.int/article-1-use-terms.
124 Christian Saravia, "Desertification and Climate Change: What's the Link?" Earth.Org, February 12, 2025, https://earth.org/desertification-and-climate-change-whats-the-link/.
125 Encyclopaedia Britannica, "Desertification"; Christian Saravia, "Desertification and Climate Change: What's the Link?"
126 "The Importance of Topsoil in Agriculture," RegenZ, accessed August 22, 2026, https://www.regenz.co.za/resources/the-importance-of-topsoil-in-agriculture.
127 Christina Nunez, "Desertification, Explained," National Geographic, May 31, 2019, https://www.nationalgeographic.com/environment/article/desertification.
128 "Deforestation and Forest Degradation," World Wildlife Fund, accessed August 22, 2026, https://www.worldwildlife.org/our-work/forests/deforestation-and-forest-degradation/.
129 Ambayeba Muimba-Kankolongo, "Pre- and Postharvest Field Operations," in Food Crop Production by Smallholder Farmers in Southern Africa: Challenges and Opportunities for Improvement (Amsterdam: Academic Press, 2018), 59–71, https://doi.org/10.1016/B978-0-12-814383-4.00007-4; Vaclovas Bogužas et al., "The Effect of Monoculture, Crop Rotation Combinations, and Continuous Bare Fallow on Soil CO_2 Emissions, Earthworms, and Productivity of Winter Rye after a 50-Year Period," Plants 11, no. 3 (February 4, 2022): 431, https://doi.org/10.3390/plants11030431.
130 International Institute for Sustainable Development, "United Nations Convention to Combat Desertification," November 28, 2024, https://enb.iisd.org/articles/united-nations-convention-combat-desertification.
131 "Waterlogging and Flooding," Royal Horticultural Society, accessed August 22, 2026, https://www.rhs.org.uk/soil-composts-mulches/waterlogging-flooding.
132 "Desertification, Land Degradation and Drought and the Role of Geneva," Geneva Environment Network, accessed August 22, 2026, https://www.genevaenvironmentnetwork.org/resources/updates/desertification-land-degradation-and-drought-and-the-role-of-geneva/; Abdul Sattar

Qureshi et al., "Managing Salinity and Waterlogging in the Indus Basin of Pakistan," Agricultural Water Management 95, no. 1 (2008): 1–10, https://doi.org/10.1016/j.agwat.2007.09.014.
133 Geneva Environment Network, "Desertification, Land Degradation and Drought and the Role of Geneva."
134 International Institute for Sustainable Development, "United Nations Convention to Combat Desertification."
135 United Nations Convention to Combat Desertification, The Global Land Outlook: West Africa Thematic Report—Land Degradation Neutrality: Benefits for Human Security (Bonn: UNCCD, 2019), https://www.unccd.int/sites/default/files/2025-10/GLO%20WEST%20AFRICA%20ENGLISH_WEB.pdf.
136 "Sahel: Climate Change Challenges," Alliance Sahel, accessed August 22, 2026, https://www.alliance-sahel.org/en/news/sahel-climate-change-challenges/.
137 "Extreme Weather," NASA Science, accessed August 22, 2026, https://science.nasa.gov/climate-change/extreme-weather/.
138 "AQUASTAT—Water Use," Food and Agriculture Organization of the United Nations, accessed June 6, 2026, https://www.fao.org/aquastat/en/overview/methodology/water-use/.
139 Food and Agriculture Organization of the United Nations, The State of Food and Agriculture 2020: Overcoming Water Challenges in Agriculture (Rome: FAO, 2020), https://doi.org/10.4060/cb1447en.
140 Refka Shaheen, "Long-Term Solutions to Address Water Scarcity in Jordan," EcoMENA, December 31, 2025, https://www.ecomena.org/long-term-solutions-to-address-water-scarcity-in-jordan/.
141 World Bank Group, Country Partnership Framework for the Democratic Republic of Congo for the Period FY22–26 (Washington, DC: World Bank, January 24, 2022), Report No. 168084-ZR, https://documents1.worldbank.org/curated/en/214221646062568502/pdf/Congo-Democratic-Republic-of-Country-Partnership-Framework-for-the-Period-FY22-26.pdf.
142 "Water Stress: A Global Problem That's Getting Worse," Council on Foreign Relations, March 20, 2026, https://www.cfr.org/backgrounders/water-stress-global-problem-thats-getting-worse; Carlo Ingrao et al., "Water Scarcity in Agriculture: An Overview of Causes, Impacts and Approaches for Reducing the Risks," Heliyon 9, no. 7 (July 2023): e18507, https://doi.org/10.1016/j.heliyon.2023.e18507.
143 "What's the Difference Between Dirt and Soil?" Forest Preserve District of Will County, April 11, 2023, https://www.reconnectwithnature.org/headlines/news/what-difference-dirt-vs-soil.
144 David R. Montgomery, "Soil Security and Global Food Security," Frontiers of Agricultural Science and Engineering 11, no. 1 (2024), https://journal.hep.com.cn/fase/EN/10.15302/J-FASE-2023530.
145 "Key Messages," Food and Agriculture Organization of the United Nations, accessed August 22, 2026, https://www.fao.org/about/meetings/soil-erosion-symposium/key-messages/en/; "Soil Erosion and Degradation," World Wildlife Fund, accessed August 22, 2026, https://www.worldwildlife.org/our-work/forests/soil-erosion-and-degradation/.
146 Weronika Strzyżyńska, "Can the World Feed 8 Billion People Sustainably?" The Guardian, November 15, 2022, https://www.theguardian.com/global-development/2022/nov/15/can-the-world-feed-8bn-people-sustainably.
147 Food and Agriculture Organization of the United Nations, How to Feed the World in 2050 (Rome: Food and Agriculture Organization of the United Nations, 2009), https://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf; Craig Hanson and Janet Ranganathan, "How to Manage the Global Land Squeeze? Produce, Protect, Reduce, Restore," World Resources Institute, July 20, 2023, https://www.wri.org/insights/manage-global-land-squeeze-produce-protect-reduce-restore.
148 Food and Agriculture Organization of the United Nations, "FAO Report: 1.7 Billion People Experience Lower Crop Yields."
149 "FAO Builds Resilience of Farming and Pastoral Communities through Mechanized Land Restoration," Food and Agriculture Organization of the United Nations, September 7, 2025, https://www.fao.org/in-action/action-against-desertification/news/detail/fao-builds-resilience-of-farming-and-pastoral-communities-through-mechanized-land-restoration/en; Food and Agriculture Organization of the United Nations, "FAO Report: 1.7 Billion People Experience Lower Crop Yields."
150 "Desertification, Land Degradation and Drought, and the Role of Geneva," Geneva Environment Network, last updated August 28, 2026, https://www.genevaenvironmentnetwork.org/resources/updates/desertification-land-degradation-and-drought-and-the-role-of-geneva/.
151 "FAO Report: 1.7 Billion People Experience Lower Crop Yields Due to Land Degradation," Food and Agriculture Organization, March 11, 2025, https://www.fao.org/north-america/news/details/fao-report--1.7-billion-people-experience-lower-crop-yields-due-to-land-degradation/en; Edward B. Barbier and Jacob P. Hochard, "Does Land Degradation Increase Poverty in Developing Countries?" PLOS ONE 11, no. 5 (May 11, 2016): e0152973, https://doi.org/10.1371/journal.pone.0152973.
152 "Understanding Mobile Pastoralism: Key to Prevent Conflict," Food and Agriculture Organization, October 28, 2016, https://www.fao.org/africa/news-stories/news-detail/Understanding-mobile-pastoralism-key-to-prevent-conflict/en; "From Sand and Dust Storms to Sustainability: How Pastoral Communities Are Reviving Rangelands," Food and Agriculture Organization, July 13, 2025, https://www.fao.org/neareast/news/blog/greening-agriculture--water-scarcity-and-climate-action/2025/07/13/from-sand-and-dust-storms-to-sustainability--how-pastoral-communities-are-reviving-rangelands/en.
153 "Transitioning from Humanitarian Relief to Long-Term Development: Addressing the Herdsmen-Farmers Conflict in Nigeria," United Nations Trust Fund for Human Security, accessed September 17, 2026, https://www.un.org/humansecurity/hsprogramme/herders-farmers-conflict/.
154 International Fund for Agricultural Development and United Nations Environment Programme, Smallholders, Food Security, and the Environment (Rome: International Fund for Agricultural Development, 2013), https://www.ifad.org/climate/resources/smallholders_report.pdf.
155 Food and Agriculture Organization of the United Nations et al., The State of Food Security and Nutrition in the World 2024 (Rome: FAO, 2024), https://doi.org/10.4060/cd1254en.
156 Mounir Louhaichi et al., Global Actions for Sustainable Rangelands and Pastoralism to Achieve Land Degradation Neutrality: A Policy Brief, with Recommendations for the UNCCD Conference of the Parties (COP) (New York: International Year of Rangelands and Pastoralists, March 2024), https://iyrp.info/sites/iyrp.org/files/IYRP_LDN_Policy_Brief%20high-res.pdf; International Fund for Agricultural Development and United Nations Environment Programme, Smallholders, Food Security, and the Environment.
157 International Food Policy Research Institute, Food Policy: Lessons and Priorities for a Changing World (Washington, DC: IFPRI, 2025), https://www.ifpri.org/global-food-policy-report/.
158 Food Security Information Network and Global Network Against Food Crises, Global Report on Food Crises 2025 (Rome: FSIN, 2025), https://www.fightfoodcrises.net/global-report-food-crises.
159 "Food Security Update," World Bank, accessed June 6, 2026, https://www.worldbank.org/en/topic/agriculture/brief/food-security-update.
160 Intergovernmental Panel on Climate Change, "Chapter 5: Food Security," in Climate Change and Land (Geneva: IPCC, 2019), https://www.ipcc.ch/srccl/chapter/chapter-5/.
161 International Organization for Migration and Stockholm Environment Institute, Addressing the Land Degradation–Migration Nexus: The Role of Measures Taken to Implement the UNCCD (Bonn: United Nations Convention to Combat Desertification, 2019), https://environmentalmigration.iom.int/sites/g/files/tmzbdl1411/files/IOM%20UNCCD%20Desertification%202019%20FINAL.pdf.
162 Tzili Mor, Towards a Gender-Responsive Implementation of the United Nations Convention to Combat Desertification (Washington, DC: UN Women, 2018), https://www.unwomen.org/en/digital-library/publications/2018/2/towards-a-gender-responsive-implementation-of-the-un-

convention-to-combat-desertification; International Fund for Agricultural Development and United Nations Environment Programme, Smallholders, Food Security, and the Environment.
163 Temitope O. Ojo et al., "The Role of Sustainable Land Management Practices in Enhancing Food Security and Climate Resilience," Frontiers in Sustainable Food Systems 8 (2024), https://www.frontiersin.org/journals/sustainable-food-systems/articles/10.3389/fsufs.2024.1414243/full.
164 "Sahel RESILAND," World Bank, accessed August 1, 2026, https://www.worldbank.org/en/programs/sahel-resiland/overview.
165 United Nations Convention to Combat Desertification, Global Land Outlook 2: Land Restoration for Recovery and Resilience (Bonn: UNCCD, 2022), 5, https://www.unccd.int/resources/global-land-outlook/glo2.
166 United Nations Convention to Combat Desertification, United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (Bonn: UNCCD, 1994), https://www.unccd.int/resource/convention-text.
167 "Action Programmes," United Nations Convention to Combat Desertification, accessed August 22, 2026, https://www.unccd.int/convention/regions/action-programmes.
168 United Nations Convention to Combat Desertification, Land Degradation Neutrality: The Target Setting Programme (Bonn: UNCCD, 2017), https://www.unccd.int/sites/default/files/relevant-links/2017-03/ldn_ts_low_res.pdf.
169 "Goal 15: Life on Land," United Nations Department of Economic and Social Affairs, accessed June 6, 2026, https://sdgs.un.org/goals/goal15.
170 "Sustainable Land Management," Food and Agriculture Organization, accessed June 6, 2026, https://www.fao.org/land-water/land/sustainable-land-management/en/.
171 African Union, "Great Green Wall Initiative," accessed June 6, 2026, https://au.int/en/ggwi.
172 African Union, "Great Green Wall Initiative."
173 "Who We Are," World Bank, accessed August 29, 2026, https://www.worldbank.org/ext/en/who-we-are.
174 World Bank, "Sahel RESILAND," accessed June 6, 2026, https://www.worldbank.org/en/programs/sahel-resiland/overview.
175 Global Environment Facility, "Land Degradation," accessed June 28, 2026, https://www.thegef.org/what-we-do/topics/land-degradation.
176 "Action Against Desertification," Food and Agriculture Organization, accessed August 22, 2026, https://www.fao.org/in-action/action-against-desertification/en/.
177 Geneva Environment Network, "Desertification, Land Degradation and Drought and the Role of Geneva."
178 "Climate Change: Land Degradation and Desertification," World Health Organization, October 26, 2020, https://www.who.int/news-room/questions-and-answers/item/climate-change-land-degradation-and-desertification.
179 United Nations Convention to Combat Desertification, Global Land Outlook 2, 18–21.
180 Food and Agriculture Organization of the United Nations, The State of Food and Agriculture 2025: Addressing Land Degradation Across Landholding Scales (Rome: FAO, 2025), https://doi.org/10.4060/cd7067en.
181 Sergio M. Vicente-Serrano et al., The Global Threat of Drying Lands: Regional and Global Aridity Trends and Future Projections (Bonn: United Nations Convention to Combat Desertification, 2024), 9–10, https://www.unccd.int/resources/reports/global-threat-drying-lands-regional-and-global-aridity-trends-and-future.
182 "Climate Crisis Under Our Feet: Why Food, Soil and Land Belong at the Heart of Climate Action," World Wildlife Fund, August 16, 2026, https://wwf.panda.org/discover/our_focus/climate_and_energy_practice/?16160441/Climate-Crisis-Under-Our-Feed-why-food-soild-land-belong-heart-climate-action; Ana Costiniu, "The Grass Beneath Our Feet: Why Rangelands Matter," UN News, August 15, 2026, https://news.un.org/en/story/2026/08/1168119.
183 Samantha Kuzma, Liz Saccoccia, and Marlena Chertock, "25 Countries, Housing One-Quarter of the Population, Face Extremely High Water Stress."
184 United Nations Educational, Scientific and Cultural Organization, The United Nations World Water Development Report 2021: Valuing Water (Paris: UNESCO, 2021), https://www.unesco.org/en/reports/wwdr/2021.
185 Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, The IPBES Assessment Report on Land Degradation and Restoration (Bonn: IPBES, 2018), 20–21, https://www.ipbes.net/assessment-reports/ldr.
186 Food and Agriculture Organization of the United Nations, The State of Food and Agriculture 2025.
187 Organisation for Economic Co-operation and Development, Global Drought Outlook: Trends, Impacts and Policies to Adapt to a Drier World (Paris: OECD Publishing, 2025), https://doi.org/10.1787/d492583a-en.
188 Organisation for Economic Co-operation and Development, Global Drought Outlook.
189 United Nations Convention to Combat Desertification, Global Land Outlook 2, 18–21.
190 World Food Programme, "Central Sahel Emergency," accessed July 16, 2026, https://www.wfp.org/emergencies/sahel-emergency.
191 United Nations, "18 Million in Africa's Sahel on 'the Brink of Starvation," UN News, May 20, 2022, https://news.un.org/en/story/2022/05/1118702.
192 World Food Programme, Internal Audit of WFP's Level 3 Emergency Response for the Sahel—August 2019, AR/19/15, September 10, 2019, https://www.wfp.org/audit-reports/internal-audit-wfps-level-3-emergency-response-sahel-august-2019.
193 World Food Programme, "Central Sahel Emergency."
194 United Nations, "18 million in Africa's Sahel on 'the brink of starvation'".
195 The Associated Press, "A Bitter Eid al-Adha in Mali's Capital as al-Qaida-Linked Blockade Sends Sheep Prices Soaring," AP News, May 27, 2026, https://apnews.com/article/mali-insecurity-eid-aladha-bamako-jnim-4011ccc0a85421c83d5365d2201fadfa.
196 Food and Agriculture Organization of the United Nations and World Food Programme, Hunger Hotspots: FAO-WFP Early Warnings on Acute Food Insecurity, June to October 2025 Outlook (Rome: FAO and WFP, 2025), 6–8, https://www.wfp.org/publications/hunger-hotspots-fao-wfp-early-warnings-acute-food-insecurity.
197 World Food Programme, "Central Sahel Emergency."
198 World Food Programme, "Central Sahel Emergency."
199 "Chad," World Food Programme, accessed August 22, 2026, https://www.wfp.org/countries/chad; Edouard de Bray, "Chad: Africa's Refugee Haven Struggles with Its Own Stark Challenges," UN News, February 5, 2026, https://news.un.org/en/story/2026/02/1166904.
200 World Bank, Food and Nutrition Security Update, no. 123 (June 2026), 6, https://thedocs.worldbank.org/en/doc/40ebbf38f5a6b68bfc11e5273e1405d4-0090012022/related/Food-and-Nutrition-Security-Update-edition-123-June-2026.pdf.
201 World Meteorological Organization, State of the Climate in Africa 2020, WMO-No. 1275 (Geneva: World Meteorological Organization, 2021), https://uneca.org/sites/default/files/ACPC/State-of-the-Climate-in-Africa/WMO_State%20of%20the%20Climate%20in%20Africa%202020_Report_en.pdf.
202 Intergovernmental Panel on Climate Change, "Chapter 5: Food Security," in Climate Change and Land (Geneva: IPCC, 2019), https://www.ipcc.ch/srccl/chapter/chapter-5/.
203 "Sahel Emergency," World Food Programme, accessed August 22, 2026, https://www.wfp.org/emergencies/sahel-emergency.
204 Evelyn Fey, "From Hunger to Harvests: How Land Restoration Is Transforming the Sahel," World Food Programme, August 26, 2026, https://www.wfp.org/stories/hunger-harvests-how-land-restoration-transforming-sahel.

205 Fey, "From Hunger to Harvests: How Land Restoration Is Transforming the Sahel."
206 World Food Programme, "Sahel Emergency."
207 Daniyar Egen, "Loss of Agricultural Land and Consequent Risks in Central Asia," Bloomsbury Intelligence and Security Institute, November 14, 2025, https://bisi.org.uk/reports/loss-of-agricultural-land-and-consequent-risks-in-central-asia.
208 United Nations Convention to Combat Desertification, Global Land Outlook 2, 18–21; M. Sacande, M. Parfondry, and A. Martucci, Biophysical and Socio-economic Baselines: The Starting Point for Action Against Desertification (Rome, Italy: Food and Agriculture Organization of the United Nations, 2018), https://openknowledge.fao.org/items/53642fd4-14d7-419a-8b40-1a1380e1ab2c.
209 "World Bank Provides $346 Million to Strengthen Resilience and Livelihoods in the Lake Chad Region," World Bank, May 26, 2020, https://www.worldbank.org/en/news/press-release/2020/05/26/world-bank-provides-346-million-to-strengthen-resilience-and-livelihoods-in-the-lake-chad-region.
210 "Harvesting Hope: How Communities Are Reviving the Lake Chad Region," World Bank, October 24, 2025, https://www.worldbank.org/en/news/feature/2025/10/24/harvesting-hope-how-communities-are-reviving-the-lake-chad-region.
211 World Bank, "Harvesting Hope: How Communities Are Reviving the Lake Chad Region"; Oli Brown and Janani Vivekananda, "Lake Chad Shrinking? It's a Story That Masks Serious Failures of Governance," The Guardian, October 22, 2019, www.theguardian.com/global-development/2019/oct/22/lake-chad-shrinking-story-masks-serious-failures-of-governance.
212 Michael Oppenheimer et al., "Sea Level Rise and Implications for Low-Lying Islands, Coasts and Communities," in IPCC Special Report on the Ocean and Cryosphere in a Changing Climate (Cambridge: Cambridge University Press, 2019), 321–445, www.ipcc.ch/srocc/chapter/chapter-4-sea-level-rise-and-implications-for-low-lying-islands-coasts-and-communities/; R. P. Kranendonk et al., Report on Regional Baselines: Deliverable D1.1 (Wageningen: Wageningen University & Research, 2025), nbracer.eu/wp-content/uploads/2025/10/NBRACER-D1.1-Regional-Baseline-Reportl.pdf; Slade T. Laszewski, Navigating Hydrosocial Territories: Soil Moisture, Vegetation Greenness and Governance Dynamics of an Ecosystem Service (Miami University, 2025), etd.ohiolink.edu/acprod/odb_etd/ws/send_file/send?accession=miami1753357175608968&disposition=inline.
213 World Bank, "Environment Program in Central Asia," World Bank, June 29, 2025, https://www.worldbank.org/en/brief/2025/06/29/climate-and-environment-program-in-central-asia.
214 Regional Environmental Centre for Central Asia, "The RESILAND Tajikistan Project: Revitalizing Landscapes for Prosperity and a Sustainable Future," July 2, 2025, https://carececo.org/en/main/news/proekt-resiland-tadzhikistan-vozrozhdenie-landshaftov-dlya-protsvetaniya-i-ustoychivogo-budushchego/.
215 World Resources Institute, "Initiative 20x20," accessed September 18, 2026, https://www.wri.org/initiatives/initiative-20x20.
216 Natalia Ruiz-Guevara et al., Strategy Initiative 20x20: Restoring Multifunctional Landscapes in Latin America and the Caribbean by 2030 (Initiative 20x20, February 2025), https://initiative20x20.org/sites/default/files/2025-02/Strategy%20Initiative%2020x20_english_doc.pdf.
217 Abraham Ename Minko, "Exploring Resilience Strategies in the Lake Chad Basin amid Climate Change, Natural Disasters and Conflict," Humanitarian Practice Network, February 17, 2025, https://odihpn.org/en/publication/exploring-resilience-strategies-in-the-lake-chad-basin-amid-climate-change-natural-disasters-and-conflict/.
218 "Climate-Smart Agriculture," World Bank, accessed August 22, 2026, https://www.worldbank.org/en/topic/climate-smart-agriculture.
219 UNCCD Global Mechanism, Investing in Land's Future: Financial Needs Assessment for UNCCD (Bonn, Germany: United Nations Convention to Combat Desertification, 2024), https://www.unccd.int/resources/publications/investing-lands-future-financial-needs-assessment-unccd.
220 United Nations Convention to Combat Desertification, Global Land Outlook 2, 18–21.
221 United Nations Convention to Combat Desertification, Global Land Outlook 2, 18–21.
222 African Union, African Union Great Green Wall Initiative Strategy and Ten-Year Implementation Framework: Enhancing Ecosystems Restoration and Livelihoods Resilience, 2024–2034 (Addis Ababa: African Union Commission, 2024), 8–13, https://au.int/en/documents/20240530/african-union-great-green-wall-initiative-strategy-and-ten-year-implementation.
223 United Nations Convention to Combat Desertification, Global Land Outlook 2, 18–21.
224 "Sahel RESILAND," World Bank, accessed July 16, 2026, https://www.worldbank.org/en/programs/sahel-resiland/overview.
225 United Nations Convention to Combat Desertification, Global Land Outlook 2, 18–21.
226 United Nations Convention to Combat Desertification, Global Land Outlook Thematic Report on Rangelands and Pastoralists (Bonn: United Nations Convention to Combat Desertification, 2024), https://www.unccd.int/resources/global-land-outlook/glo-thematic-report-rangelands-and-pastoralists; United Nations Convention to Combat Desertification, Global Land Outlook 2, 18–21.
227 Samantha Kuzma, Emilia Tandon, and Tien Shiao, "One-Quarter of World's Crops Threatened by Water Risks," World Resources Institute, October 16, 2024, https://www.wri.org/insights/growing-water-risks-food-crops.
228 World Bank, "Climate-Smart Agriculture."
229 United Nations Convention to Combat Desertification, Global Land Outlook 2, 18–21.
230 United Nations Convention to Combat Desertification, Global Land Outlook 2, 18–21.
231 "EU Soil Strategy for 2030," European Commission, accessed July 16, 2026, https://environment.ec.europa.eu/topics/soil-health/soil-strategy-2030_en.
232 "Land Degradation Neutrality Fund," United Nations Convention to Combat Desertification, accessed August 22, 2026, https://www.unccd.int/land-and-life/land-degradation-neutrality/impact-investment-fund-land-degradation-neutrality.
233 "FAO Strategic Framework 2022–31," Food and Agriculture Organization, accessed June 6, 2026, https://www.fao.org/strategic-framework/en.
234 Food and Agriculture Organization of the United Nations, Tackling Land Degradation for Sustainable Agrifood Systems (Rome: FAO, 2025), https://www.fao.org/interactive/2025/tackling-land-degradation/en/.
235 "Sustainable Food and Agriculture," Food and Agriculture Organization of the United Nations, accessed June 6, 2026, https://www.fao.org/sustainability/en/; "Nutrition and Food Systems," Food and Agriculture Organization of the United Nations, accessed August 22, 2026, https://www.fao.org/policy-support/policy-themes/nutrition-and-food-systems/.
236 Food and Agriculture Organization of the United Nations, FAO Strategic Framework 2022–2031 (Rome: FAO, 2021), https://www.fao.org/about/strategy-programme-budget/overview/FAO-Strategic-Framework/.
237 "FAO Strategic Framework," Food and Agriculture Organization of the United Nations, accessed August 22, 2026, https://www.fao.org/climate-change/what-we-do/fao-strategic-framework/; Food and Agriculture Organization of the United Nations, Tackling Land Degradation for Sustainable Agrifood Systems.

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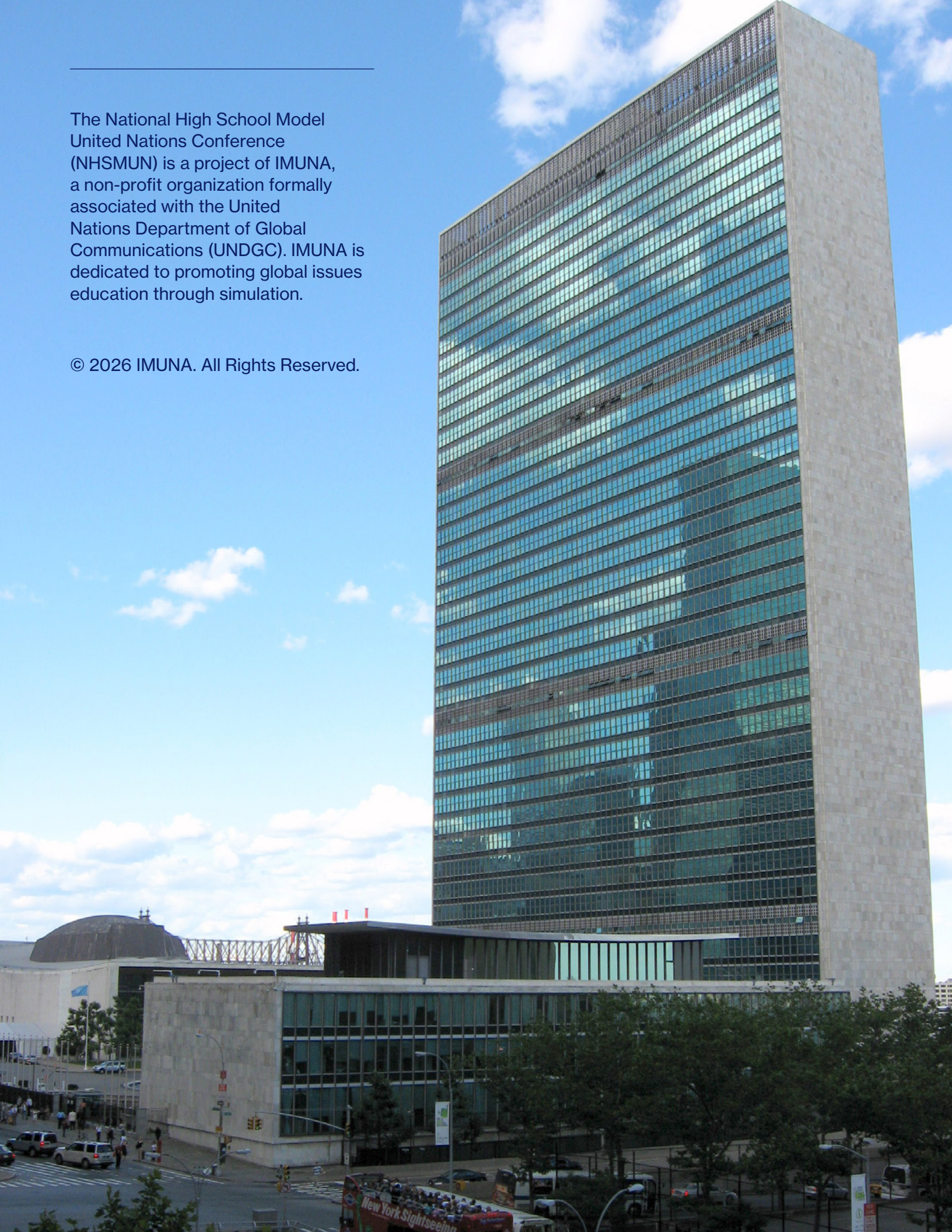
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