Committee : UNGA
Agenda : The Convention on Biological Diversity and its Contribution to Sustainable Development

I. Post-2020 Global Biodiversity Framework

"Current negative trends in biodiversity and ecosystems are projected to undermine progress towards 80 per cent of the target for the Sustainable Development Goals. We simply cannot allow this to happen… By halting environmentally harmful practices, diversifying our food systems and promoting more sustainable production and consumption patterns, we can improve global health, increase food security and strengthen resilience to climate change."[65]

Introduction

The Post-2020 Global Biodiversity Framework refers specifically to a document that will be adopted at the 15th Conference of the Parties (COP) of the *Convention on Biological Diversity* (CBD) in October 2020.[66] The COP of the CBD is the governing body of the Convention, which is made up of Member States and advances implementation of the CBD.[67] The CBD, adopted in 1992, defines biological diversity, also known as biodiversity, as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems."[68] In simpler terms, biodiversity can be defined as "the diversity within species, between species and of ecosystems."[69] Biodiversity and our natural ecosystems are intertwined with food, energy, and water production, as well as human health and well-being, yet the rate of decline of biodiversity is higher than ever before.[70] According to a recent report from the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), approximately 25% of all species are threatened, with 1 million facing extinction.[71]

Within the international development discourse, degradation of land, ecosystems, and biodiversity have been separated from debates about sustainable consumption even though they are inextricably linked.[72] The *United Nations Convention to Combat Desertification* (UNCCD) (1994) defines land degradation as:

> "reduction or loss… of the biological or economic productivity and complexity of [land]… resulting from land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns, such as: soil erosion caused by wind or water; deterioration of the physical, chemical and biological or economic properties of soil; and long-term loss of natural vegetation."[73]

The Post-2020 Global Biodiversity Framework will likely address the unsustainable production and consumption patterns that are responsible for a large part of the loss of biodiversity and degradation of ecosystems.[74] In the past 50 years, the world's population has doubled, with personal consumption also increasing 15% in the same time frame.[75] While more food and energy are being provided in most parts

of the world, this comes at the expense of nature's ability to continue to provide.[76] Over half of the agricultural expansion since 1992 has been into tropical forests, an abundant source of biodiversity.[77] Freshwater ecosystems have been negatively impacted by runoff containing high amounts fertilizers flowing into coastal waters, causing both excessive plant growth and oxygen-depleted "dead zones."[78] These ecosystems are further harmed as over 80% of wastewater is released back into freshwater ecosystems without being treated.[79] The land and natural resources managed by indigenous peoples and local communities (IPLCs) are experiencing increasing pressure from unsustainable consumption and production practices, but biodiversity is declining less rapidly in these areas as compared to non-IPLC protected areas.[80] As IPLCs increasingly come under threat from climate change, so does their knowledge about how to sustainably manage the land and natural resources.[81] The Post-2020 Global Biodiversity Framework will aim at addressing the challenges to protect biodiversity and set ambitious targets for the international community.[82]

International and Regional Framework

The CBD is the foundational UN document protecting environmental biodiversity and is legally-binding for the 157 States parties that have ratified the Convention (196 Member States are States parties to the CBD).[83] The CBD serves as the foundation of the Post-2020 Global Biodiversity Framework.[84] It aims to preserve biodiversity through three main pillars: conservation of biodiversity, ensuring sustainable consumption of biological and genetic resources (referring to "genetic material of actual or potential value"), and equitably sharing benefits that arise from the use of different genetic resources.[85] There are two primary protocols under the CBD, the *Cartagena Protocol on Biosafety* (2000) and the *Nagoya Protocol on Access to Genetic Resource and the Fair and Equitable Sharing of Benefits Arising from their Utilization* (2010), as well as a subsequent *Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety* (2010).[86] The *Cartagena Protocol* deals directly with promoting biosafety and ensuring proper use and application of biotechnology, while the *Nagoya Protocol* calls for equitable benefit-sharing of knowledge generated from the utilization of genetic resources,

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particularly for indigenous communities.[87] Both frameworks have been an important aspect of discussions framing the Post-2020 Global Biodiversity consultation process.[88]

The COP of the CBD adopted the *Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets: "Living in Harmony with Nature"* (*Strategic Plan for Biodiversity*) at its 10th meeting in 2010.[89] The *Strategic Plan for Biodiversity* created a framework for the international community to coordinate efforts to protect and enhance biodiversity.[90] The *Strategic Plan for Biodiversity* also established the 2050 Vision for Biodiversity for "living in harmony with nature," articulating the goal that "by 2050, biodiversity is valued, conserved, restored and widely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people."[91] The Aichi Biodiversity Targets consist of five strategic goals and 20 sub-targets, ranging from education and awareness of the importance of biodiversity, to enhancing their protection and safeguarding ecosystems.[92] The Targets are flexible and intended for adaptation and adoption by individual Member States and actors.[93]

The COP decision 14/34 (2018) established the framework for participation in the negotiations of the Post-2020 Global Diversity Framework, which is set to replace the *Strategic Plan for Biodiversity* and bring the international community into the next decade of biodiversity preservation.[94] The participatory process established in decision 14/34 is intended to be inclusive of all parties, including governments, indigenous peoples, scientists and academics, and non-governmental organizations, and be responsive to gender perspectives, iterative, and consensus and knowledge-based.[95] An example of the participatory, transparent process is the report "Synthesis of the views of parties and observers on the scope and content of the post-2020 global biodiversity framework" that was released in January 2019 and summarizes submissions and feedback on the Post-2020 Global Biodiversity Framework from key international stakeholders.[96]

Protecting biodiversity is a complex problem that is interrelated with many other environmental issues.[97] The CBD and Post-2020 Global Biodiversity Framework are supported by many other UN conventions, such as the UNCCD, the *Convention on International Trade in Endangered Species of Wild Fauna and Flora*, the *Convention on the Conservation of Migratory Species of Wild Animals*, the *International Treaty on Plant Genetic Resources for Food and Agriculture*, and the *Convention on Wetlands of International Importance*.[98] Biodiversity is explicitly tied to the achievement of the UN *2030 Agenda for Sustainable Development* (*2030 Agenda*) and the Sustainable Development Goals (SDGs), particularly SDGs 14 (life below water) and SDG 15 (protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt

biodiversity loss), which emphasize protecting marine and land ecosystems.[99] The CBD and the Post-2020 Global Biodiversity Framework are also supported by the *Paris Agreement* (2015), which attempts to combat climate change by limiting global temperature rise to below 2 degrees Celsius by 2100.[100] As the international community adopts the Post-2020 Global Biodiversity Framework, Member States will also be asked to update their national climate action plans under the *Paris Agreement.*[101]

Role of the International System

The Post-2020 Global Biodiversity Framework will be supported by previous agreements and ongoing work of the UN system and international community.[102] The United Nation General Assembly (unga), as the governing body of UNEP, helps to build broad-based consensus about the importance of taking action on key environmental issues, such as conserving biodiversity.[103] The CBD Secretariat has a significant role to play in implementing the CBD and the decisions of the COP of the CBD, and in developing the Post-2020 Global Biodiversity Framework.[104] The CBD Secretariat has issued a discussion paper to assist participation in the Post-2020 Global Biodiversity Framework development process.[105] The discussion paper highlights relevant decisions for the development process for the Framework – such as the CBD and the *Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets* – and briefly summarizes the submissions that have been received so far during the consultation process.[106] The discussion paper also poses questions to stimulate ongoing discussion about the Framework and to engage the private sector, non-governmental organizations, civil society, indigenous Peoples, and youth.[107]

The CBD Secretariat is also responsible for the Clearing-House Mechanism (CHM), a global mechanism for technical and scientific cooperation and information-sharing that facilitates the implementation of the CBD, the *Strategic Plan for Biodiversity*, the Aichi Biodiversity Targets, and what will be the Post-2020 Global Biodiversity Framework.[108] The CHM also connects national CHMs between Member States, and operates the CBD Secretariat website, a hub for information on international action for biodiversity.[109] The CBD Secretariat facilitates the work of the COP and produces the Global Biodiversity Outlook (GBO), a periodic report on the state of biodiversity internationally.[110] The Access and Benefit-sharing (ABS) Clearing-House is different than the CHM, but is also housed under the CBD Secretariat.[111] The ABS Clearing-House Mechanism is an information-sharing platform on genetic resources and their associated traditional knowledge to facilitate equitable benefit-sharing between traditional knowledge holders a those using that knowledge for economic gain, which has been identified as an issue to be addressed by the Post-2020 Global Biodiversity Framework.[112]

The CBD Secretariat is housed under the United Nations Environment Programme (UNEP).[113] unga has issued statements calling for Member States to be actively involved in the engagement and consultation process leading up to the Post-2020 Global Biodiversity Framework.[114] The unga has adopted two recent resolutions on biodiversity, "Mainstreaming of biodiversity for well-being" (UNEP/EA.2/Res.16) and "Innovation on biodiversity and land degradation" (UNEP/EA.4/Res.10).[115] The resolution on "Mainstreaming of biodiversity for well-being" explicitly recognizes the importance of biodiversity to other cross-cutting issues such as food security, human health, and the economy.[116] The resolution on "Innovation on biodiversity and land degradation" also acknowledges the complexity of addressing

biodiversity, and encourages UNEP to cooperate with other UN agencies and organizations that have mandates that rely on the protection and conservation of biodiversity.[117] The unga has requested the CBD Secretariat inform the upcoming High-Level Political Forum on Sustainable Development, a two-day forum that gathers senior officials and leaders from Member States to discuss and advance issues related

to sustainable development.[118] The unga also encourages coordination between other UN agencies, such as the Food and Agriculture Organization (FAO).[119] There are synergies between the mandates of UNEP, FAO, CBD, and the Post-2020 Global Biodiversity Framework, particularly regarding the

relationship between biodiversity and food security.[120]

The IPBES, established in 2012, is an independent intergovernmental body tasked with conducting assessments on issues related to conservation of biodiversity, providing policy support to the international community through publications and reports, building capacity and knowledge, and conducting communications and outreach to raise awareness about the importance of protecting biodiversity.[121] IPBES published the landmark report and summary document titled "Global Assessment Report on Biodiversity and Ecosystem Services," which contains information on major global trends for biodiversity, the relationship between biodiversity and major international agreements, and recommendations and options for decision-makers for protecting biodiversity.[122] Recently, the unga has called for increased coordination and collaboration between UNEP and the IPBES to enhance synergies across all UN entities with work related to protecting biodiversity.[123]

IPLCs and civil society play an important role in the development of the Post-2020 Global Biodiversity Framework.[124] The rate of biodiversity loss is slower on lands that are managed by IPLCs.[125] Article 8(j) of

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the CBD requires Parties to the Convention to "respect, preserve, and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application"[126] Working Group on Article 8(j) is dedicated to the implementation of Article 8(j) under the auspices of the CBD Secretariat.[127] In November 2019, the CBD Secretariat will host the "Global Thematic Dialogue for Indigenous Peoples and Local Communities on the Post-2020 Global Biodiversity Framework," which will also allow participants to reflect on the proposals for the upcoming Working Group on Article 8(j) meeting.[128] The CBD Secretariat also facilitates the Traditional Knowledge Information Portal, which serves both to promote the participation of IPLCs in the work on biodiversity and to provide information about traditional and indigenous knowledge related to biodiversity.[129]

The UN General Assembly, while not directly involved in the drafting of the Post-2020 Global Biodiversity Framework, has a role to play in mainstreaming issues and in building consensus around protecting the planet's biodiversity and ecosystems.[130] The UN General Assembly, in its resolution 55/201 on "Convention on Biological Diversity," established 22 May of every year as the International Day for Biological Diversity.[131] The General Assembly also proclaimed 2011-2020 to be the United Nations Decade on Biodiversity (UNDB) in an effort to promote the implementation of the *Strategic Plan for Biodiversity*.[132] More recently, the General Assembly has proclaimed that 2021-2030 will the United Nations Decade on Ecosystem Restoration.[133] Moreover, the General Assembly adopted resolution 72/221 on "Implementation of the Convention on Biological Diversity and its contribution to sustainable development," which calls for Member States to implement the CBD and ratify the subsequent *Nagoya*

and *Cartagena* protocols, and for an inclusive and participatory process for the follow-up of the Aichi Biodiversity Targets.[134] Resolution 72/221 also emphasizes links between biodiversity to the SDGs and invites the CBD Secretariat to report back to the General Assembly on the work of Working Group on

Article 8(j).[135]

The CBD and the *Strategic Plan for Biodiversity* is implemented on the national and regional level through *National Biodiversity Strategies and Action Plans* (NBSAPs) and *Regional Biodiversity Strategies and Action Plans* (RBSAPs).[136] Regional strategies include the Arctic Council's Working Group on Conservation of Arctic Flora and Fauna's strategy, the European Union's Environmental Council's strategy, and the Southern African Development Community's regional strategy.[137] NBSAPs include information on how countries will implement the CBD on a local level and protect biodiversity within their borders.[138] Submissions from participants involved in the Post-2020 Global Biodiversity Framework consultations have noted that NBSAPs should continue to be the primary mechanisms for implementing

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the CBD and targets related to biodiversity.[139] Post-2020 Global Biodiversity Framework discussions have also highlighted the need for better tracking implementation at regional levels.[140]

Links between Biodiversity and the Sustainable Development Goals

The 2030 Agenda provides a strategic roadmap for the international community's development agenda in 17 distinct but interconnected goals, which tie together issues like climate change and biodiversity to development overall.[141] References are made specifically to biodiversity in the targets for SDG 14 and SDG 15.[142] In the last 50 years, the world has seen major declines in unique water ecosystems, such as a 40% loss of mangrove ecosystems in the last 30 years.[143] SDG 14 has specific targets aimed at conservation and preservation of marine ecosystems, which will help reduce the loss of marine biodiversity.[144] SDG 15 directly addresses the loss of biodiversity in land ecosystems.[145] There is significant overlap between the Aichi Biodiversity Targets and the targets under SDG 15, and it is likely that there will be increased coordination between the 2030 Agenda and the coming Post-2020 Global Biodiversity Framework.[146] Healthy, biodiverse ecosystems and sustainable use of natural resources contribute to goals SDG 1 (no poverty), SDG 2 (zero hunger), and SDG 12 (sustainable consumption and production).[147]

SDG 17 (sustainable development through global partnerships) seeks to strengthen global partnerships through improving mechanisms of financing, capacity-building, and technology-sharing to help improve the ability of Member States to achieve the SDGs.[148] This includes macro-level coordination and policy coherence throughout the international system.[149] Given the interconnectedness between protecting biodiversity and all of the SDGs, SDG 17 will have significant importance for the Post-2020 Global Biodiversity Framework.[150] The CBD Secretariat maintains the Global Partnership for Business and Biodiversity, a network of 21 national and regional initiatives already underway, which helps facilitate SDG 17, target 6 for multi-stakeholder partnerships.[151] This partnership seeks to engage businesses and mainstream the issue of biodiversity in the private sector.[152] Businesses, including those in the financial sector, all rely to some degree on healthy, biodiverse ecosystems and are increasingly exposed to risk as the loss of biodiversity accelerates.[153]

The declining state of biodiversity around the world will negatively impact international efforts to achieve the 2030 Agenda and slow progress for 80% of the SDGs.[154] The IPBES's recent report demonstrates that the SDGs are inextricably linked with both the loss of biodiversity and changes to our climate.[155] Despite the *Paris Agreement* commitment on temperature rise, it is predicted that temperatures could rise up to 5 degrees Celsius before 2100, which will have a significant impact on biodiversity and ecosystems around the world.[156]

Access and Benefit-Sharing, Traditional Knowledge, and Biodiversity

Discussions on the Post-2020 Global Biodiversity Framework have already noted that ensuring equitable benefits from the use, extraction, and exploitation of the wealth of biodiversity and genetic resources needs to be addressed in the Post-2020 Framework.[157] Most of the world's biodiversity is found within developing countries and is often an important component of economic and social development.[158] Under the CBD, Parties to the Convention have undertaken "to respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities (…) for the conversation and sustainable use of biological diversity (…) and encourage the equitable sharing of benefits arising from the utilization of such knowledge, innovations and practices."[159] The *Nagoya Protocol* is the international framework for access and benefit-sharing; a legal framework covering an aspect of the protection required under Article 8(j) of the CBD.[160]

Working Group on Article 8(j) represents a unique aspect of how the protection of biodiversity is interrelated to other SDGs and the broader development agenda, and includes representation and input from Parties to the CBD and IPLCs.[161] Ensuring more equitable sharing of dividends from unique applications of genetic resources has the potential to benefit communities by providing access to jobs, research, and profit.[162] The Working Group and the CBD cooperate with other UN and international entities, including the United Nations Permanent Forum on indigenous Issues; FAO; the United Nations Conference on Trade and Development (UNCTAD); and the World Intellectual Property Organization (WIPO).[163]

While the rate of extraction and exploitation of genetic resources from IPLCs and developing countries is slowing due to scientific advancements, there is still a need to protect the knowledge of IPLCs, which is currently not covered under international intellectual property law regimes.[164] The use of IPLCs'

knowledge in protecting and conserving biological diversity goes much deeper than just uses of genetic resources.[165] WIPO currently has an Intergovernmental Committee that is undertaking negotiations with the goal of producing a legally-binding agreement to protect indigenous and traditional knowledge and its relationship to genetic resources and biodiversity.[166]

Biodiversity and Food Security

Biodiversity is key to the production of food and agricultural practices.[167] The *Nagoya Protocol* recognizes the interconnected nature of biodiversity, genetic resources, and food and agricultural production.[168] The Protocol also supports the implementation of the *International Treaty for Plant Genetic Resources for Food and Agriculture* (ITPGRFA), which establishes a multilateral ABS system for 64 crops that are key to ensuring food security.[169] The ITPGRFA is a legally-binding instrument that supports the preservation and sustainable use of genetic resources and biodiversity for food and agricultural purposes.[170] Biodiversity for food and agriculture (BFA), a subcategory of biodiversity, refers to the both the biodiversity of the food we eat, and the biodiversity required in an ecosystem to support food production.[171] This includes pollination, air and soil quality, pests and diseases, and habitat protection.[172] As the world experiences an increase in natural disasters, food shortages, and drought due to climate change, BFA will become increasingly important in helping with human resilience to these catastrophes.[173]

Modern biotechnology, defined in the *Cartagena Protocol,* refers to technological applications that modify seeds, living organisms, and other genetic resources.[174] Biosafety encompasses the potential damage that unfettered advances in biotechnology could have on biodiversity and the environment.[175] The full extent of adverse impacts of modern biotechnology on biodiversity and human health has yet to discovered.[176] The UNEP-Global Environment Facility (GEF) Biosafety Unit helps to support parties with obligations under the CBD and the *Cartagena Protocol* to development biosafety frameworks.[177] UNEP-GEF is also responsible for a capacity-building initiative to increase efficacy of participation in the Biosafety Clearing House, which helps countries exchange information on biosafety and share best practices for the safe use of biotechnology.[178]

BFA is essential for food security and nutrition for the world.[179] Around the world, crop diversity within fields is decreasing, threats to biodiversity are increasing, and almost one-third of fish stocks are overfished.[180] By 2016, 9% of the breeds of domesticated mammals in food production had become extinct, with one-sixth of those remaining now threatened.[181] Certain agricultural practices, including those with heavy use of fertilizers and pesticides, are contributing to the loss of biodiversity.[182] Furthermore, unsustainable agricultural practices put traditional and local knowledge and IPLCs at risk, in addition to biodiversity.[183] 33% of soil is now degraded because of such intensive and unsustainable practices, which has led to the development of the Global Soil Partnership (GSP) in 2012 as a mechanism to coordinate

collaboration between all stakeholders.[184] The unga has recently noted the importance of biodiversity for food and agriculture and instructed the UNEP Executive Director to continue to collaborate with the GSP and FAO.[185]

Conclusion

Loss of biodiversity around the world is increasing rapidly, despite the adoption of the CBD in 1992.[186] Leading up to the implementation of the Post-2020 Global Biodiversity Framework, the unga has been encouraging Member States to be actively involved in the negotiation and consultation process.[187] The Post-2020 Global Biodiversity Framework will build on the previous *Strategic Plan for Biodiversity*, the 2030 Agenda, and the ongoing work of the international community to preserve and conserve biodiversity.[188] However, the Framework will also need to address the increasing amount of literature and research indicating negative trends for biodiversity and the significant impacts this will have across the entire global development agenda.[189]

Further Research

Moving forward, delegates can consider questions such as: How can unga foster international collaboration and consensus towards the Post-2020 Global Biodiversity Framework? How can unga support the adoption and implementation of the Post-2020 Global Biodiversity Framework? How can other UN bodies assist with the implementation of the Framework? How can the Post-2020 Global Biodiversity Framework build on the *Strategic Plan for Biodiversity* and the 2030 Agenda? How can the international community and policy frameworks simultaneously protect IPLCs and also leverage local and traditional knowledge to protect biodiversity?

> *the current state and impact of the global food system on biodiversity, including the impacts of agribusiness, biotechnology, pollution, and climate change. Delegates will find Chapter 4 on the Status and Trends of Biodiversity for Food and Agriculture particularly useful in developing their understanding of this subtopic, and Section C on Management helpful in guiding discussions and solutions. Part D enumerates the frameworks and policies in place to support the protection of biological diversity for food production.*

Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. (2019). *Global Assessment Report on Biodiversity and Ecosystem Services*. Retrieved 20 July 2019 from: https://www.ipbes.net/global-assessment-report-biodiversity-ecosystem-services
United Nations, Conference on Environment and Development. (2012). *Convention on Biological Diversity*. Retrieved 20 July 2019 from: https://www.cbd.int/doc/legal/cbd-en.pdf

> *The CBD is fundamental to understanding the Post-2020 Global Biodiversity Framework because it establishes the secretariat, the Conference of the Parties, and is the foundation for all UN-related work on biodiversity leading up to the Post-2020 Framework. Delegates will gain from reading the original Convention, adopted in 1992, establishing the protection of biodiversity as a critical component of the global environmental agenda. The Convention defines biological diversity and establishes an initial framework for reporting on biological diversity, conservation, access and benefit-sharing, public education, and awareness.*

United Nations, Convention on Biological Diversity Secretariat. (2018). *Preparations for the Post-2020 Biodiversity Framework.* Retrieved 21 July 2019 from: https://www.cbd.int/conferences/post2020

> *This website, prepared by the secretariat for the CBD, provides a comprehensive overview of the timelines and meetings leading up to the anticipated adoption of the Post-2020 Framework. The website includes a visual graphic that demonstrates the inclusive and iterative process of meetings and consultations leading up to COP OF THE CBD 15. Delegates will find this website useful as a starting point for understanding how international frameworks are developed and which UN bodies are involved in the drafting of the Framework. Delegates will find helpful links on this website to discussion papers, information notes, and documents for each of the consultation sessions.*

United Nations, Convention on Biological Diversity Secretariat. (2019). *Post-2020 Global Biodiversity Framework: Discussion Paper*. Retrieved 20 July 2019 from: https://www.cbd.int/doc/c/d431/b38f/3d580bb73e7c2b5aaa286310/post2020-prep-01-01-en.pdf

> *This discussion paper outlines all decisions relevant to the development of the Post-2020 Framework and synthesizes submissions on the development of the new Framework. The paper has been circulated for consultation to help inform the development of the Framework for the COP OF THE CBD. It poses questions for discussion that delegates will find helpful to guide their debate of this topic, and to provide some ideas on how unga might engage with the development of the Framework.*

e by 2050.[190] Rising population growth is accompanied by further need for the production and consumption of products, which will cause strains on the environment and its resources.[191] The United Nations Environment Programme (UN Environment) estimates that an increasing global population will mean a 55% increase in demand for water and a 60% increase in food production.[192] While the achievements and changes of the past few decades around the world have lifted millions of people out of poverty, such progress has not come without environmental strains.[193] The increased demand for energy, food, water, and a multitude of resources contributes to pollution, environmental degradation, resource depletion, and climate change.[194] A significant element of achieving sustainable development is the transition towards Sustainable Consumption and Production (SCP).[195] SCP focuses on providing the needs of all, while simultaneously using fewer resources and producing less pollution and waste.[196] One of the leading definitions of SCP was defined in the 1994 *Oslo Symposium on Sustainable Consumption* as "the use of services and related products, which respond to basic needs and bring a better quality of life while minimizing the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardize the needs of further generations."[197]

Similarly, UN Environment's more recent definition from 2011 describes SCP as a "holistic approach to minimizing the negative environmental impacts from consumption and production systems while promoting quality of life for all."[198] SCP should be inclusive of all sectors, and demands an approach that is inclusive of many stakeholders, including governments, the private sector, and consumers.[199] The main principles of SCP include improving quality of life without increasing environmental degradation, decoupling economic growth from environmental degradation, and reducing material/energy intensity of current economic activities.[200] SCP also includes applying life-cycle thinking which reflects each stage of the production and consumption processes.[201]

When referring to consumption patterns, this includes water, energy, and food.[202] As it relates to water, excessive use of water strains water resources, and the infrastructure used to deliver water is also expensive.[203] Energy consumption also continues to increase as households contribute to 21% of CO2 emissions.[204] Food production and consumption also represent around 30% of the world's total energy consumption and count for 22% of greenhouse gas emissions.[205] This means a substantial impact on the environment from agriculture and food processing, as well as household dietary choices and habits.[206] Agriculture represents the largest use of water worldwide, with irrigation utilizing 70% of all freshwater.[207]

International and Regional Framework

The United Nation's (UN) first major conference on international environmental issues was held in Stockholm, Sweden, in 1972, symbolizing a turning point in the development of environmental politics on an international level.[208] The United Nations Conference on the Human Environment, also known as the Stockholm Conference, established 26 principles which sought to address concerns that included toxic waste, environmental protection, and environmental legislation in a spirit of global cooperation and partnership.[209] The *Montreal Protocol on Substances that Deplete the Ozone Layer* of 1989*,* commonly known as the Montreal Protocol, was among the first international frameworks to address sustainability and consumption.[210] Its aim was to protect the Earth's ozone layer by eliminating the use of substances which deplete it.[211] To date, it is the only UN treaty that has been ratified by all 193 UN Member States and has significantly protected the ozone layer from further depletion.[212]

The need for a transition specifically towards SCP was first highlighted at the Rio Earth Summit in 1992, in which it was established that environmental protection must be an integral part of sustainable development through global partnership.[213] The United Nations Conference on Environment and Development of 1992 produced *Agenda 21*, which provided a guiding framework for the UN as it relates to sustainable development.[214] Chapter 4 of *Agenda 21* promotes SCP on a national level by encouraging Member States to identify and develop their specific consumption and production patterns.[215] *Agenda*

21's overarching goals are to promote efficient production, to reduce waste, and encourage patterns of consumption and production that had a reduced impact on the environment.[216]

The *Basel Convention* of 1992 addressed transboundary movements of hazardous wastes and their disposal.[217] The actions laid out by the *Basel Convention* play an important role in helping to achieve waste minimization.[218] The *Rotterdam Convention* of 1998 promotes shared international responsibility as it relates to the trade of hazardous chemicals and seeks to ensure environmental sound use of such chemicals.[219] The *Stockholm Convention on Persistent Organic Pollutants,* commonly known as the *Stockholm Convention* of 2001 aims to protect human health and the environment from harmful organic pollutants.[220] These three conventions merged into a single secretariat in 2012, under the leadership of UN Environment with the purpose of coordinating with other international bodies.[221] The 2002 *Johannesburg Plan of Implementation* (JPOI) was adopted at the World Summit on Sustainable Development and described SCP as an essential element to achieving sustainable development.[222] Chapter 3 of the JPOI emphasized this, stating that improving SCP to include economic and social development would be crucial to promoting sustainable development.[223] Building on this, Member States met in 2012 for the UN Conference on Sustainable Development (Rio+20).[224] The conference adopted *The Future We Want* (2012), which included comprehensive language on what the future of SCP should strive to achieve.[225] This document details the priorities of SCP with specific and measurable objectives.[226] Green economic policies was a topic of significant emphasis at Rio+20.[227]

SCP forms a crucial component of the Sustainable Development Goals (SDGs), with SDG 12 (responsible consumption and production) being specifically focused on the transition towards SCP patterns.[228] The *2030 Agenda for Sustainable Development* (2030 Agenda) notes the importance of a global collaboration through a "mobilization, from all sources, of financial and technical assistance to strengthen developing countries' scientific, technological and innovative capacities to move towards more sustainable patterns of consumption and production."[229] SDG 12 (responsible consumption and production) is comprised of 11 targets along with 13 indicators and addresses numerous subtopics related to SCP needs, including objectives around the efficient use of natural resources, reducing food waste, and the transition towards sustainable public procurement practices.[230]

SDG indicators mirror the targets by providing specific measurable objectives which Member States should strive towards.[231] SCP-specific indicators include the global food loss index, national rates of recycling, number of companies publishing sustainability reports, amount of hazardous waste produced per capita, or number of countries with a national SCP policy.[232]

Notable regional documents on SCP include the *Sustainable Consumption Production Action Plan for the Mediterranean*, which addresses key human activities that contribute to marine and coastal environment issues.[233] By 2027, the SCP Action Plan hopes to have achieved a Mediterranean region that is established with non-pollutant, socially inclusive economies that simultaneously ensure the preservation of natural resources and ecosystems that can provide goods and services for present and future generations.[234]

Role of the International System

As the UN's overarching governance body for environmental matters, the United Nations Environment Assembly (unga) holds a particular importance in the achievement of SCP.[235] The *Medium Term Strategy 2018-2021* is the unga's organizational strategy that outlines its vision for the future.[236] Under the *Medium Term Strategy 2018-2021* are seven thematic priorities which include climate change; disasters and conflicts; ecosystem management; environmental governance; chemicals and waste; resource efficiency; and environment.[237] The *Medium Term Strategy* also responds to exponentially increasing needs for water, food and other resources.[238] Thus, the *Medium Term Strategy* strives to direct a sustainable utilization of natural resources to ensure sustainability in the long term.[239]

The fourth session of the unga most recently met in March of 2019 with its theme centered on navigating pathways and strategies to achieve SCP.[240] Some decisions from the fourth session include resolutions on innovative pathways to achieve SCP, promoting sustainable practices and innovative solutions for curbing food loss and waste, sound waste management practices, and addressing single use plastics.[241] Most notably, the resolution "Innovative pathways to achieve SCP" called on all stakeholders, including manufacturers, retailers, and consumers, on how to improve their collaboration by providing consumers and public authorities with the tools to make informed choices regarding SCP.[242] Specifically, the resolution noted the importance of reliable consumer information relating to resource efficiency so as to increase the longevity and re-use of products and the recycling of materials.[243] The resolution also requested that the Executive Director provide a study based on a life-cycle approach to assess the potential of current economic models for achieving SCP in particular sectors such as that of plastics, textiles, and the construction sector.[244] The resolution recalled key past and present frameworks such as the SDGs, the *10-Year Framework of Programmes on Sustainable Consumption and Production Patterns* (10YFP), and the 2015 *Paris Agreement*.[245] It also highlighted the importance of the 2015 *Addis Ababa Action Agenda of the Third International Conference on Financing for Development*.[246]

Among the targets within this resolution is facilitating the implementation of the 10YFP while taking into account the development and capabilities of developing countries.[247] The 10YFP is a collective impact of numerous stakeholders which scales up SCP policies through six programs: Sustainable Public Procurement, Consumer Information for SCP, Sustainable Tourism, Sustainable Lifestyles and Education, Sustainable Buildings and Construction, and Sustainable Food Systems.[248] The 10YFP symbolizes the realization that a global shift towards achieving SCP requires the commitment of diverse stakeholders, and change to occur at all levels of the economy.[249]

A report titled "Towards a Pollution-Free Planet" was published in 2017 by the Executive Director of UN Environment and details the impact of pollution on human health as well as ecosystems.[250] This report elaborates on the evidence of global pollution ranging from air, land, soil, freshwater, marine, and coastal pollution and their impacts and economic costs, ranging from air, land, soil, freshwater, marine, and coastal pollution.[251] To address this challenge, the report offers challenges and opportunities in the context of the 2030 Agenda while also discussing the many governance frameworks that aim to address specific sub-issues within SCP such as the *Paris Agreement*, and the Stockholm, Rotterdam, and Basel Conventions.[252] The final component of the report includes a proposed transition to a pollution-free planet that mainly advocates for targeted interventions of "hard-hitting" pollutants and key pollution areas as well as resource efficiency into production processes, supply chains and other key economic transformations.[253]

unga also cooperates with a number of other UN bodies in its work on the transition towards SCP.[254] The Division for Sustainable Development Goals (DSDG) within the UN Department of Economic and Social Affairs, provides capacity-building and substantive support across the UN system in relation to the SDGs and accompanying issues of importance such as water, energy, climate,

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urbanization, transport, science and technology.[255] Additionally, the High-Level Political Forum on Sustainable Development (HLPF) serves as the central platform within the UN that is responsible for the review and follow-up of the SDGs.[256] Further coordination across the goals is also provided through collaborations between for example UN Environment and the UN Conference on Sustainable Development, which seeks to align the environmental and economic aspects of sustainable development into clear, cohesive policy guidelines.[257]

Individual project partnerships also include the Poverty-Environment Initiative, which is a program initiated by the United Nations Development Programme (UNDP) and UN Environment, which seeks to bring lasting institutional change, and which encourages key actors to increase investment in pro-poor environmental and natural resource management.[258]

Given the nature of SCP, and as recognized in UN Environment's *Medium Term Strategy*, synergy between the public and private sectors are essential in producing meaningful progress.[259] unga works with organizations such as the International Chamber of Commerce to create forums through which policy makers and private businesses can interact and develop shared objectives.[260]

Unsustainable Production Patterns

Sustainable production patterns are characterized by a direct link between resource efficiency and SCP.[261] Resource efficiency is the concept of using fewer resources to achieve the same or improved product or result.[262] It is also an indicator of the manner in which resources are utilized by individuals, companies, sectors, or economies.[263] Unsustainable production can mean the excessive use of resources to create a product when the same product can be designed with fewer raw materials.[264] However, today's markets are full of examples in which products are designed in a manner that require replacement, and thus more raw materials.[265] UN Environment has stated that resource efficiency is only possible if consumers, both individual and institutional, demand sustainable products and services.[266] A demand for unnecessarily resource-intensive products often means that a competitive economic field will ultimately meet the demand.[267]

One approach to this challenge includes increasing the eco-efficiency of production, which may include reducing the natural resources used in production as well as its related waste and emissions, which is not only beneficial to the environment but also saves production costs.[268] More so, this is an encouraging incentive for businesses involved in the manufacturing of products.[269] Identifying production patterns and processes, as well as industry sectors that have the highest contribution to environmental impacts, helps policymakers and companies develop new production processes that are sustainable and eco-efficient.[270]

A 2010 UN Environment report identified fossil fuels, agriculture, and fisheries as high-impact sectors, as it relates to production processes as well as their impact on climate change, acidification of soils, or eutrophication of water bodies.[271] There is thus much opportunity in the heavy industry and agricultural sectors for eco-efficiency to be further developed.[272] Other opportunities to increase eco-efficiency of production systems include improving recycling, in which many materials have a large recycling potential.[273]

The unsustainable management of chemicals and wastes also adversely affects human life and the environment, as addressed in SDG 12 (responsible consumption and production).[274] There are also challenges related to the air, soil, and water's exposure to toxic chemicals.[275] Thus, the sound management of chemicals and waste from production practices is critical to preventing further land degradation and environmental harm.[276] There are a number of ways in which Member States can increase sustainability in their production.[277] Many governments have formulated policies which require mandates for land usage, waste disposal, and energy efficiency through legislation, financial incentives, or both.[278]

It is similarly important to engage the private sector when thinking of ways to promote SCP, as most products and services are provided by private businesses.[279] As producers, the private sector is in a position to apply a 'life-cycle perspective'; acknowledging that they have a responsibility for the total impact that is caused through a product's life-cycle.[280] Green economies driven by resource efficiency and sustainable business strategies can result in more resilient supply chains, reduced dependency on natural resources, increased consumer demand for sustainable goods and services, mitigation against the negative financial risk from environmental impact, new investment opportunities, job creation, and more.[281]

Unsustainable Consumption

Worldwide material consumption reached 92.1 billion tons in 2017 compared to that of 27 billion in 1970.[282] It is estimated that this figure will rise to 190 billion by 2060 if the global material footprint continues to grow.[283] Demand for natural resources continues to increase, with current material needs subjecting the environment to possible over-extraction of resources.[284] The material footprint per capita has similarly increased since 1990 in which 8.1 tons of natural resources were utilized to fill an individual's needs, compared to 12 tons of resources extracted per individual in 2015.[285] The global material footprint is increasing, surpassing both population and economic growth.[286]

Changing consumer behavior as it relates to consumption patterns are of importance; however, SDG 12 (responsible consumption and production) also highlights the significance of focusing on supply chain operations, involving all parties from the producer to the final consumer.[287] Such measures can include

but are not limited to educating consumers about sustainable lifestyles through disseminating information, and the utilization of standards, labels and engaging in sustainable public procurement.[288] Labeling, subsidies and information campaigns are all areas in which governments have an opportunity to be involved.[289]

Life-cycle thinking can be significant, as it prompts consumers to reflect on how products have been produced, and the environmental costs that come with it.[290] For example, few consider how a product is disposed of once they are done using it without thinking of how it can be reused, recycled, or disposed of safely.[291] Products that are used daily can impact the environment in numerous ways, including the toxic release of pollutants, greenhouse gas emissions, and nutrient discharges to water.[292] The life-cycle approach also includes taking into account all stages of production, all the way from raw materials extraction, the design and production, packaging and distribution to the end-of-life management

In light of this, UN Environment hosts the Life Cycle Initiative, a partnership that consists of both public and private stakeholders which enables the global use of credible, science-based life-cycle knowledge by all stakeholders to encourage more sustainable decisions.[293] The Life Cycle Initiative seeks to incorporate life-cycle thinking in at least 15 countries and 30 companies by 2022, among other goals.[294] Additionally, UN Environment has responded to related emerging SCP needs through several initiatives, including the Education for Sustainable Consumption, and Sustainable Lifestyles and Youth programs.[295] Through Education for Sustainable Consumption, individuals learn how to adopt more sustainable lifestyle choices, consume more responsibly, and engage in policy debates through seeking creative new solutions.[296] Similarly, the Sustainable Lifestyles and Youth program is promoting responsible use of natural resource, equitable socio-economic development, and a better quality of life for all.[297] Through these initiatives, UN Environment is seeking to address the need for new educational models that foster a generation of citizens and youth who integrate sustainability in their professional and personal choices.[298] UN Environment believes that through such initiatives, tackling challenges related to climate change, resource shortage, and the loss of biodiversity can be achieved when behavioral change embodies sustainable lifestyles, particularly by engaging youth.[299] Educating young consumers on sustainable consumption, namely those below the age of 25, means nearly half of the world's population can become engaged in SCP.[300]

Conclusion

If the global population reaches 9.6 billion by 2050, the equivalent of almost three planets could be required to provide the resources needed to sustain current lifestyles.301 Decades of work by the UN, Member States, and civil society have built the sustainability

frameworks and platforms in place today.[302] One of the most salient global challenges is the integration of environmental sustainability with economic growth.[303] The commitments made by Member States as it relates to SCP as a whole are vital to the

achievement of SDG 12 (responsible consumption and production).[304] Shifts towards methods of production that do not overburden or damage the environment, while also transforming consumer behaviors to provide an environment wherein this is possible, is essential for ensuring that the environmental and economic perspectives of sustainable development are able to be mutually reinforcing.[305]

Further Research

Civil society often plays an important role in formulating the agreements, and resolutions we see today. What further role can they take part in influencing consumer behavior? Similarly, what gaps in SCP need to be closed in order to halt further environmental degradation, resource over-extraction, and other harmful outcomes as a result of unsustainable consumption and production? How can responsible consumption and production be further integrated with economic growth? What roles do retailers, consumers, and parties in between have in meaningfully shifting towards a more resource efficient economy? Essentially, how can the global community "do more with less?" Reflecting on the unga's most recent session, what should be prioritized at unga's fifth session to be held in 2021?

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> *This report serves as a handbook for policymakers which outlines both an introduction to SCP policy and thematic policy opportunities. This document can deepen one's understanding of why SCP policy is necessary to achieve sustainable development and provides comprehensive frameworks on how SCP can be applied. This resource also details the key principles of SCP, including resource efficiency, life-cycle thinking, and improving the quality of life for all while preventing further environmental degradation. This handbook also includes some key trends in consumption and production, and an outlook for the future with the purpose of engaging all stakeholders.*

United Nations Environment Programme. (2016). *Medium Term Strategy 2018-2021*. Retrieved 20 July 2019 from: https://wedocs.unep.org/rest/bitstreams/11369/retrieve

> *This strategy document for unga and UN Environment serves as the organization's primary strategic blueprint, including an overview of its role in relation to SCP. It details a current "situation analysis," which describes the challenges linked to resource efficiency and growing demographic pressures. It also includes operating principles, a vision for*
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> *2030 and lays out specific priority areas and proposed outcomes for the future. These include specific goals for the areas of climate change, resilience to disasters and conflicts, healthy and productive ecosystems, environmental governance, chemicals, waste and air quality, and resource efficiency. Delegates should find this helpful as it details the long-term strategy and goals towards sustainability and also contextualizes the 17 Sustainable Development Goals.*

United Nations, General Assembly, Sixty-sixth session. (2012). *The Future We Want (A/RES/66/288)*. Retrieved 20 July 2019 from: http://undocs.org/A/RES/66/288

> *The Future We Want is the outcome document from Rio+20 and comprehensively represents what the future of SCP should strive to achieve. It is one of the most influential documents on the environment. This document details the priorities of SCP and will be an important resource for delegates as they understand and work through goals of SCP, further assess the current situation and expand their understanding of the needs of the future of SCP.*

II. Mitigation of and Adaptation to Desertification and Drought

"Protecting and restoring land, and better using it, can reduce forced migration, improve food security, and spur economic growth. It can also help us to address the global climate emergency. On this World Day [to Combat Desertification], let us recognize the imperative of combatting desertification as part of our efforts to achieve the Sustainable Development Goals."[306]

Introduction

The *United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa* (UNCCD) was established in 1994, and defines desertification as the degradation of land resulting from various factors including both climatic conditions and human factors.[307] This definition does not include the expansion of existing deserts, which is known as desert encroachment.[308] In 2019, the UN Secretary-General warned that 24 billion tons of fertile land is lost every year to desertification.[309] Land degradation is the temporary or permanent reduction of soil quality.[310] This degradation includes the loss of vegetation, water resources, wildlife, and the economic productivity of the soil.[311] Desertification and drought occur as a result of exploitation of land resources, overgrazing, and bad irrigation practices.[312] Over one-third of the world's land area is composed of dryland ecosystems, which are the most vulnerable to desertification.[313] The UN estimates that by 2045, approximately 135 million people will be displaced as a result of desertification.[314] The demand for water is expected to increase by 50% by the year 2050 and the UNCCD estimates that by 2050, 1.8 billion people will experience absolute water scarcity, with two-thirds of the world population living under water stressed conditions.[315]

Drought is defined as an extended period of deficient rainfall.[316] While there is no global baseline for determining the duration of this period, it is commonly characterized by deficiencies in land surface water, insufficient soil moisture, lack of precipitation, and depleted agricultural yields.[317] The effects of drought may be direct or indirect.[318] Examples of direct impacts include increased fire hazards, increased livestock and wildlife mortality rates, and reduced water levels.[319] Collectively, these direct impacts lead to indirect impacts which are generally seen as more intangible, albeit with economic, environmental, or social ramifications.[320] The economic impacts of drought affect agricultural production by destruction of crops and farmland and characterized by problems such as forest fires, while its social impacts include forced migration of human and wildlife populations.[321] The mitigation of drought requires short and long-term actions.[322] These actions include early warning systems, establishment of management techniques and objectives in each drought level, defining the conditions based on climatic and geographical regions,

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and the thresholds to declare drought levels.[323] Adaptation measures include the improvement and use of infrastructure for improved climate, water monitoring, capacity-building at all levels, and training for farmers and pastoralists, including women and youth, on how sustainable farming practices and livestock production.[324]

International and Regional Framework

The UNCCD is the sole legally-binding international agreement that links environmental development to Sustainable Land Management (SLM).[325] The 197 Parties to the Convention work together to maintain and restore land productivity and to address desertification and drought.[326] Since land, climate, and biodiversity are closely connected, the UNCCD also works with the *Convention on Biological Diversity* (CBD) and the *United Nations Framework Convention on Climate Change*, as they have similar goals and together form an integrated approach for the sustainable use of natural resources.[327]

The Conference of the Parties (COP) to the UNCCD has also adopted the *2018 – 2030 Strategic Framework* to reverse and minimize the effects of desertification and drought.[328] This Framework seeks to build a future with neutral land degradation, consistent with the *2030 Agenda for Sustainable Development* (2030 Agenda), within the scope of the UNCCD.[329] The objectives of this strategic framework include the improvement of currently affected ecosystems, promotion of SLM, and land degradation neutrality (LDN).[330] Other objectives include improving the living conditions of affected populations and mitigation of, and adaptation to, drought in order to enhance resilience of vulnerable populations and ecosystems.[331] The framework also seeks to generate global environmental benefits through effective implementation of the UNCCD and mobilization and capacity-building at all levels.[332]

In 2017, the Gender Action Plan (GAP) was adopted by the COP of the UNCCD.[333] This action plan recognizes and stresses the need for gender-responsive policy in the mitigation of desertification.[334] GAP's policies are designed to promote participation by women through economic empowerment, access to land and resources, technology development and transfer, and capacity-building.[335] These policies are implemented through partnership with women's organizations, associations, cooperatives, as well as international bodies such as the UN Development Fund for Women, the Commission on the Status of Women, the *Convention on the Elimination of all Forms of Discrimination Against Women* (CEDAW), and the United Nations Entity for Gender Equality and the Empowerment of Women (UN-Women).[336] GAP estimates that women in developing countries that are affected by desertification produce up to 60 – 80% of the food in their respective countries, prompting the UNCCD to work towards improving and strengthening women's land rights to further enhance their ability to apply sustainable methods of production to their work.[337]

Principle 10 of the Rio Declaration of 1992 affirms that environmental issues are best handled with the participation of all concerned citizens, at all relevant levels.[338] It also sets out three fundamental rights of groups and individuals for environmental action, which are access to public participation, access to information, and access to justice.[339] These rights enhance the interaction between the scientific and technological community, and policy makers for capacity-building and implementation of adaptation and mitigation efforts on desertification, and drought.[340]

The UN Food and Agriculture Organization (FAO) has developed a vision for sustainable agriculture as a means of mitigating and adapting to desertification and drought.[341] FAO defines sustainable agriculture as use of natural resources to satisfy present needs, while simultaneously ensuring availability to sustain future generations.[342] Sustainable agriculture incorporates practices such as recycling soil nutrients by using plants that fix their own nitrogen and achieving balance between pests and predators.[343] It also reduces dependence on inorganic fertilizers and chemical pesticides and promotes crop rotation and development of agricultural systems that improve and maintain soil fertility.[344]

More recently, FAO developed a five-principle framework for practicing sustainable agriculture.[345] Principle 1 seeks to transform policy, create jobs, and increase agricultural production with a limited expansion of agricultural land.[346] Principles 2 and 3 are designed to protect natural resources and enhance the use of natural resources without damage to the environment, and improve livelihoods while ensuring inclusive economic growth, respectively.[347] Principle 4 seeks to improve the resilience of people, ecosystems, and communities to extreme weather and climate change.[348] Principle 5 seeks to institutionalize the other aspects of sustainable agriculture through government policy, and governance to promote and maintain the adoption of these sustainable agricultural practices.[349]

The FAO has also developed the Global Framework on Water Scarcity in Agriculture (WASAG) to support sustainable progress in the adaptation of agricultural systems to the challenges of climate change.[350] WASAG works to adapt global food systems to water scarcity by improving resilience to climate change.[351] WASAG was first endorsed by the Summit of Water Ministers at the Second World Irrigation Forum in 2016.[352] It now serves as a knowledge-sharing partnership to help countries develop their various drought preparedness

programs.[353] WASAG works in advocacy for political prioritization of water management, knowledge and information-sharing about sustainable water management among national, regional, and international stakeholders.[354] It also works to develop new and improved solutions and to institutionalize the integration of water resources management.[355]

In 2015, the UN General Assembly adopted the 2030 Agenda, outlining the 17 Sustainable Development Goals (SDGs) and their related targets.[356] Goal 15 specifically focuses on halting and reversing land degradation, combating desertification, and sustainably managing forests.[357] This goal has several targets directly linked to mitigating and adapting to desertification and drought.[358] Target 15.3 is aimed at combatting desertification, restoring degraded land and soil, including land affected by desertification, drought, and floods.[359] Target 15.9 seeks an integration of ecosystem and biodiversity values into national and local planning, and development processes.[360] The General Assembly has also adopted resolution 64/201 titled "United Nations Decade for Deserts and the Fight against Desertification (2010–2020)" to raise awareness about desertification and drought, and the gravity of danger posed to many species on Earth, including our own.[361]

Role of the International System

The United Nations Environment Assembly (unga) is the world's highest-level decision-making body on the environment.[362] During the Fourth Assembly of unga (unga4) in 2019, Member States proposed guidelines to foster partnership for better environmental practices.[363] The guidelines seek to promote healthy use of land resources, sustainable irrigation practices, proper management of freshwater sources, and mitigation of desertification.[364] In reaffirming their commitment to land restoration, the world's environmental ministers released a Ministerial Declaration that outlined their national strategies for restoring and protecting land resources.[365] The international community gathered in Nairobi for unga4, with the session theme "Innovative solutions for environmental challenges and sustainable consumption and production."[366] During this session, Member States and other relevant stakeholders stressed the need for inclusivity in policy making, especially of women and youth.[367] unga also adopted a decision that encouraged the Executive Director of United Nations Environment Programme (UN Environment) to work with states party to the UNCCD to implement voluntary national targets for LDN by 2030.[368]

Member States submit national reports and share information through the *Performance Review and Assessment of Implementation System* (PRAIS).[369] PRAIS is managed by the UNCCD Secretariat to promote a multilevel effective planning and implementation of the UNCCD.[370] The information gathered is publicly available to all Member States and civil society.[371] Parties to the convention have agreed to strengthen their national policies and provide support to developing countries to promote transparency and accountability.[372] The UNCCD Secretariat requires national reporting to its secretariat to stay up-to-date on results and challenges faced by Member States.[373] The UNCCD uses this information to adopt

policies focused on the mitigation of the effects of drought, to combat desertification, maintain and restore soil productivity, and improve the livelihoods of people in drylands.[374]

The World Day to Combat Desertification and Drought is observed annually on 17 June.[375] This observance is to promote global awareness of international efforts for addressing desertification and drought.[376] One of the objectives of this observance is to achieve LDN, defined by the Parties to the UNCCD as a "state whereby the amount and quality of land resources, necessary to support ecosystem functions and services and enhance food security, remains stable or increases within specified temporal and spatial scales and ecosystems."[377] The LDN Target Setting Programme is an initiative of the UNCCD Secretariat, in collaboration with several international partners designed to assist Member States in accomplishing national measures to achieve LDN.[378]

The UNCCD has also used SLM as a cost-effective means of combatting land degradation.[379] FAO defines SLM as the use of land resources to meet human needs while simultaneously ensuring long-term productivity to man and the environment.[380] SLM is also an effective means of reversing land degradation and desertification.[381] It involves the use of land appropriately, based on biophysical and socio-economic conditions.[382] It is based on four principles, which target policy-making and institutional support, grassroots participation, integrated use of natural resources at the ecosystem scale, and multilevel partnerships.[383]

The Global Greengrants Fund (GGF) was established in 1993 to support grassroots action on climate change.[384] It has since worked to support grassroots-led efforts around the world by directly engaging with local people and providing them with resources, and assisting with policy implementation.[385] It has also worked with non-governmental organizations to extend solutions to local communities, especially those most impacted by desertification and drought.[386] This approach is unique because it gives a local platform to advance strategies that best fit their needs.[387] Since its establishment, the organization has offered more than 12,000 grants in 168 countries totaling over $84 million.[388] In places where desertification has led to reduced agricultural production, GGF has helped local women adapt to water scarcity by adopting new agricultural practices.[389] The GGF also empowers female leaders involved in grassroots environmental action initiatives.[390] The GGF currently works in Africa, Asia, Latin America, North America, and the Pacific Islands.[391]

Expanding the Green Wall Initiative in Africa

FAO, in partnership with the UNCCD, works to enhance the development of the Great Green Wall Initiative (GGWI).[392] The GGWI is an African-led movement with a mission to grow 8,000 kilometers of

forest across the entire width of Africa.[393] The wall extends from Senegal to Djibouti, running across other West African countries in its course.[394] GGWI was instituted in 2007 and began operation at the southern edge of the Sahara desert in Africa's Sahel region, one of the poorest parts of the world.[395] The African Union (AU) also supports this initiative, and partners with data collection agencies for assessment of the project.[396] AU has also been involved in the Action Against Desertification, which is a partnership group comprised of

African, Caribbean, and Pacific island Member States to develop national action plans, and south-south cooperation.[397] These regions face the gravest impacts of climate change.[398] This is due to persistent drought, increased hunger due to lack of food, armed conflict over the remaining natural resources, and mass migration to Europe.[399]

GGWI has begun to restore life to African's Sahel region by mitigating the effects of drought and desertification.[400] Over the past decade, the initiative has achieved 15% of its objective, which is now framed more closely within the timeline of the 2030 Agenda.[401] GGWI has restored degraded landscapes, provided food security, jobs, and reduced forced migration due to desertification and drought.[402] GGWI is intended to be a literal wall, but it also serves as a metaphor for the partnership between African countries and relevant stakeholders.[403] It covers 780 million hectares of arid and semi-arid land around the Sahara, and is home to about 230 million people.[404] As part of its objective, GGWI seeks to restore ten million hectares of land per year until 2030.[405]

GGWI improves the livelihoods and living conditions of millions of lives across the African continent through restoration of degraded ecosystems and land productivity.[406] To maintain its relevance, the GGW, the operating body of the initiative, promotes strategic partnerships with rural communities and national governments.[407] The GGWI serves as a global model for mitigation and adaptation to desertification and drought and shows that even in challenging regions, success can be achieved.[408] GGWI enhances SDG 15 (life on land) by restoring degraded landscapes, and vegetation.[409] It also promotes SDG 6(clean water and sanitation).[410]

Water Scarcity and Drought

Water stress begins when available water in a country drops below 4,600 liters per day per person.[411] Water scarcity occurs when this stress drops below 2,700 liters per day per person.[412] By these definitions, 49 countries are currently water stressed, nine of which are experiencing water scarcity, with another 21 experiencing absolute water scarcity.[413] To mitigate the effects of water scarcity, water should

be treated as a scarce resource with a higher priority given to managing the demand.[414] The United Nations Development Programme (UNDP) assists in adaptation to drought by supporting projects that focus on national policy reforms, development of Integrated Water Resource Management and best practices.[415]

Agriculture accounts for over 70% of global water use, so a shortage of water could lead to reduced agricultural output.[416] Farmers in rural areas are most vulnerable to food shortages due to drought.[417] This is often due to lack of technology for better irrigation, and sustainable water management.[418]

FAO, through WASAG, has established thematic working groups.[419] One of these working groups, Drought Preparedness, works to identify practical solutions for the effects of drought and water scarcity on agriculture.[420] Some of these solutions include the adoption of saline agriculture which focuses on how to improve agriculture where saline water is the dominant water resource.[421] It works to improve technology, support stakeholder participation in research and development, and assists with training and capacity-building at local and national levels.[422] Another working group, Water and Migration, aims to alleviate the pressure caused by water scarcity in order to reduce forced migration, and the risk of armed conflict.[423] This is being achieved by promoting sustainable water use and dissemination of information based on the needs of each region.[424] WASAG also partners with several international organizations including the Consortium of International Agricultural Research Centers, Global Water Partnership, International Water Management Institute among others to strengthen local participation in realization of the GGWI.[425]

Human Security, Food Security, and Forced Migration

Land degradation affects about 2 billion hectares of land globally and approximately 1.5 billion people.[426] Around 2 billion people, 90% of whom live in developing countries, live in drylands that are more vulnerable to land degradation.[427] Over 2 billion people live in areas experiencing high water stress, 700 million of which are expected to be displaced by 2030.[428] Food production is expected to increase by 70% by 2050.[429] The destruction of 12 million hectares of agriculturally viable land annually poses a threat to sustaining this increase in demand.[430] Methods of crop production that utilize fewer inputs that help mitigate drought are now included in national, regional, and local levels of policy-making[431]

In the past 60 years, 40% of national conflicts have occurred as a result of disputes over land resources.[432] This has led to failure of fragile states and an increase in armed conflicts in affected regions.[433] The reduction of land quality and other land resources have led to the use of violence as the

major means of controlling the remaining available land.[434] People are forced to leave their homes in search of water and arable land, often traveling hundreds of miles while under the threat of violence and armed conflict.[435] In some cases, non-state actors have monopolized the flow of resources, while limiting the power of legitimate governments, with the most vulnerable social groups suffering the biggest consequences.[436] Land degradation is hampering development of regions because agriculture is a major contributor to national development, economic growth, and poverty alleviation.[437]

Rural communities in Africa are especially vulnerable to forced migration, since subsistence agriculture practiced in local communities is mostly dependent on rain and poorly-developed agricultural infrastructure.[438] Improving soil health increases agricultural production and improves security, which in turn will reduce land disputes, and the need to emigrate.[439] Since land used for agriculture accounts for most of the harmful impacts of desertification and drought, preventing land degradation is essential to food security.[440] Several regions of the world have prioritized land restoration and adopted healthy agricultural practices to maintain soil health and productivity to address this issue.[441] These practices are designed to mitigate the impacts of desertification and adapt to its effects whenever possible.[442] More

widespread adoption of healthy land practices have occurred with Member States incorporating healthy land management into their national planning.[443]

AU has initiatives to tackle the aftermath of desertification and drought, such as the African Risk Capacity (ARC).[444] ARC is an insurance mechanism providing efficient financial relief to its 33 participating states in the event of natural disasters, including drought.[445] ARC's method relies on four pillars: customized early warning systems, creating country-specific contingency plans, financing pre-approved contingency plans in the event of disasters, and pooling risks from Africa as a region.[446] ARC understands the impact of drought on food security, and has created a local financial solution that taps into the power of globalized markets.[447] Payout is determined by rainfall deviations, once that rainfall deviation has crossed a certain threshold, allowing countries to invest in early-intervention programs to respond to anticipated food insecurity and adverse impacts.[448]

Conclusion

The international community has contributed to the mitigation of and adaptation to desertification and drought through monitoring and evaluation, information-sharing, and regional cooperation to mobilize and empower more Member States to address the effects of climate change on land.[449] Desertification and drought pose a threat to food security and the need for action will become more urgent with the exponential increase in demand for food in the future.[450] Land restoration can be achieved by sustainable agriculture and irrigation practices, strengthening of technical and functional capacities of individuals,

communities, organizations and national governments, and SLM.[451] The international community has created various frameworks to combat desertification, adapt to climate change, and reduce harmful side-effects of agriculture.[452] The unga continues to seek international collaboration to strengthen existing partnerships that promote the maintenance of resilient landscapes for resilient people in the fight against desertification and drought.[453]

Further Research

With an expected increase in food production, how can the unga better prepare to cope with demand in a sustainable manner? In what ways do Member States contribute to adaptation measures to reduce the risk of humanitarian crises occurring as a result of forced migration? In areas where agriculture is the major driver of economic development, how can policy be framed to ensure that resources are not depleted, but conserved for future generations while ensuring food security? How do Member States currently encourage SLM? How can resilience of local populations be further enhanced to address the challenges of desertification and drought?