Trondheim Conferences on Biodiversity
The Eighth Conference
Trondheim 31 May – 3 June 2016

Food systems for a sustainable future:
Interlinkages between biodiversity and agriculture

The Eighth Trondheim Conference on Biodiversity
Clarion Hotel, Trondheim, Norway, 31 May – 3 June 2016

Information document

The Conference, hosted by the Norwegian Government in partnership with the Convention on Biological Diversity (CBD), the Food and Agriculture Organization of the United Nations (FAO), the Global Environment Facility (GEF), the United Nations Development Programme (UNDP), the United Nations Environment Programme (UNEP), the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the World Bank, is by invitation and will bring together up to 350 experts from governments, United Nations bodies and other international organizations, academia, private organizations and the non-governmental sector. In Norway, the Ministry of Climate and Environment, the Ministry of Foreign Affairs, the Ministry of Agriculture and Food, the Ministry of Trade, Industry and Fisheries and the Norwegian Environment Agency are cooperating in organizing the Conference.

1. Introduction

In 2010, governments adopted the 20 Aichi Biodiversity Targets (see Annex 1) as part of the Strategic Plan for Biodiversity 2011-2020, and progress and actions in addressing these targets will be reviewed at the Conference of the Parties of the Convention on Biological Diversity (CBD COP13) when it meets in Mexico later this year. The targets have been broadly accepted as a framework for action, yet more than five years after their adoption it is widely recognised that further efforts are needed in order to achieve these targets and to reverse the effects of biodiversity loss. Fundamental to these efforts are implementation of measures to address direct and indirect drivers behind such loss.

Furthermore, the Aichi Biodiversity Targets are highly relevant for achievement of the Sustainable Development Goals (SDGs) adopted by governments in September 2015 as part of the *2030 Agenda for Sustainable Development* (see Annex 2). The SDGs address the complex challenges we face in our interconnected world, and are a call to action that will shape the next fifteen years of policies, programmes and funding. They are equally relevant to all countries, and across all sectors. Agriculture is strongly connected to achieving the goals.

The present loss of biodiversity and its potential impact on ecosystem services is recognised as one of the most serious challenges for humankind. Decisions adopted within the agricultural sector, including crop and livestock production, fisheries, aquaculture and forestry, will be a significant determining factor for the future status of terrestrial, coastal and freshwater biodiversity. Biodiversity and ecosystem services are a critical foundation for food production, and the agricultural and food sector is also an important provider of ecosystem services and contributor to human well-being.

The Convention on Biological Diversity asks countries to "integrate, as far as possible and as appropriate, the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies".[1] Since the term "mainstreaming" has no internationally agreed definition and is not easily translated into different languages, for the purposes of this document the quoted text above is the frame used for its interpretation. Better integration of biodiversity and agriculture into policies and actions will help provide solutions for the challenges we will face between now and 2030. The question is then, how to realize this integration.

The consideration of interlinkages between biodiversity and agriculture entails assuming the existence of trade-offs, which are difficult to resolve. As such, there is a need for these to be promptly identified, measured and negotiated, making the information about winners, losers and costs associated with policies and measures more evident. Ultimately, decisions adopted at all levels should contribute to setting the necessary conditions for minimising the negative effects of food production on biodiversity while ensuring food security and the protection of livelihoods that depend on the agriculture sector.

Efforts to meet an increasing demand for food while conserving biodiversity are a challenge, but with the use of different tools and approaches available both agendas can be advanced. Building on the outcomes of the Seventh Trondheim Conference on Biodiversity *"Ecology and Economy for a Sustainable Society",* the Eighth Conference will explore the role of agriculture and food systems in building a sustainable future, and how biodiversity and agricultural policies can be mutually supportive to address shared challenges and to provide shared solutions.

[1] Convention on Biological Diversity, article 6.

2. Eighth Trondheim Conference on Biodiversity

Expanding opportunities for constructive dialogue with a broad range of stakeholders is one of the basic steps in integrating biodiversity and agriculture considerations into each other's agendas and operations. This will be essential to the delivery of both the Aichi Biodiversity Targets and the SDGs. The Eighth Trondheim Conference therefore aims to bring together decision-makers and experts from governments, private sector, academia, United Nations agencies, civil society and non-governmental organizations from around the globe to discuss interrelationships between agriculture (with a particular focus on crops and livestock) and biodiversity, and to identify approaches for the achievement of mutually beneficial and sustainable outcomes.

In December of this year, the Conference of the Parties to the Convention on Biological Diversity (CBD COP13) takes place in Mexico. It is intended that the deliberations and report of the Trondheim Conference will amongst other things provide inputs to the high-level segment of CBD COP13, which is focusing on mainstreaming of biodiversity into the agriculture, fisheries, forestry and tourism sectors. The Mexican Government has already prepared a non-paper or discussion paper containing elements to be considered for development of a draft Ministerial Declaration on biodiversity mainstreaming (see Annex 3).[2] It is anticipated that the Trondheim Conference will provide further input both to preparation of the draft declaration, and planning for the high-level segment.

The Trondheim Conference is organized into a number of sessions which are aimed at both informing participants about key issues, and promoting dialogue. This has been done with the support of a number of intergovernmental organizations working on these issues.

3. The purpose of this document

The aim of this short document is to enable participants to prepare in advance of the Conference so that they can usefully engage in the discussions. The document provides a brief explanation of the topics/issues that will be discussed at the Conference. It also provides summaries of useful references for further reading, including resources or publications that are directly linked to the presentations under each session, and examples of key sources referred to in the recommendation related to mainstreaming adopted at the first session of CBD Subsidiary Body of Implementation.[3] This Information Document does not aim to be a definitive text, but a resource to support discussions during the meeting.

4. Interlinkages between biodiversity and agriculture: Overarching issues and discussion

The relationship between biodiversity and agriculture is complex. In this respect, sessions 3 to 8 will explore different dimensions in which these interlinkages take place. In accordance with SDG 2, countries are called upon to promote sustainable agriculture. However, there is no definition of the term or of its components, including how biodiversity considerations should

[2] In accordance with that document, the objective of mainstreaming is to "maximise the contribution of biodiversity and ecosystem services to productive sectors, while reducing and mitigating the negative impacts of these sectors on biodiversity".

[3] The adopted recommendation is currently available under the signature UNEP/CBD/SBI/1/L.12, from https://www.cbd.int/insession/SBI-01.

be related to the implementation of sustainable agriculture. How to deliver sustainable agriculture by considering biodiversity will be explored.

4.1 Imperatives and implications (session 3)

Ecosystem services – the benefits that people obtain from ecosystems – are traditionally categorised depending on the type of service they provide. These include provisioning services, which are the goods or products obtained from ecosystems (e.g. food, genetic resources); regulating services, which are the benefits received from the regulation of ecosystem processes (e.g. pollination); supporting services, which are those that are necessary for the production of other ecosystem services (e.g. soil formation, nutrient cycling); and cultural services, which refer to non-material benefits that are obtained from ecosystems (e.g. cultural heritage).[4]

Session 3 will focus on the interactions between ecosystem services and food production. It will focus on pollination, soil formation, and genetic resources, all of which have clear links to food production.

Examples of key resources relevant to this session include:

- The *Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) Thematic assessment of pollinators, pollination and food production (2015)* (and its Summary for Policy Makers) was produced by a group of experts at the request of the IPBES Plenary. The thematic assessment aims to assess animal pollination as a regulating ecosystem service underpinning food production, while supporting human well-being. In particular, the assessment aims to enhance the understanding of the economic, environmental, and socio-cultural values of pollinators and pollination. The assessment analyses the status and trends of pollinators and pollination, as well as the drivers of change that are affecting the abundance, diversity and health of pollinators and the provision of pollination. The document provides a series of recommendations focused on policy and management options. The Summary for Policymakers is available in the six United Nations languages at http://www.ipbes.net/plenary/ipbes-4 The English version can downloaded from http://www.ipbes.net/sites/default/files/downloads/Pollination_Summary%20for%20policymakers_EN_.pdf

- The *Status of the World's Soil Resources* (2015) and its Technical Summary provide a global and regional assessment of current and projected soil conditions, and their impact on human well-being, particularly considering food security, climate change, water quality and quantity, biodiversity, and human health. It also includes a series of recommendations for action targeted to diverse stakeholders including government, private sector, and scientific community in order to improve the status of the world's soil. The full report is available at http://www.fao.org/documents/card/en/c/c6814873-efc3-41db-b7d3-2081a10ede50/
  The technical summary is available at *http://www.fao.org/documents/card/en/c/39bc9f2b-7493-4ab6-b024-feeaf49d4d01/*

- The *Second Report of the State of the World's Animal Genetic Resources for Food and Agriculture* (2015) presents an overview and analysis of the status and trends of animal genetic resources and their management at national, regional and global levels, while identifying gaps and priorities for action. The full report and a brief version are available at *http://www.fao.org/publications/sowangr/en/*

- The *Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture* (2010) provides an overview of the global status of the conservation and use of plant genetic resources for food and agriculture, including in relation to the developments

[4] Millennium Ecosystem Assessment

in policies, practices, and in science and technology that impact those resources at the global, regional and national levels. The full report and a brief version are available at *http://www.fao.org/agriculture/crops/thematic-sitemap/theme/seeds-pgr/sow/sow2/en/*

4.2 Policies and institutions (session 4)

The 2030 Agenda for Sustainable Development and its SDGs provide multiple objectives that countries are aiming to achieve (see Annex 2), which will require identifying priorities sector by sector and analysing trade-offs between and within sectors. It is broadly recognised that the implementation of the 2030 Agenda will need to be made in a mutually supportive manner with the Strategic Plan for Biodiversity 2011-2020 and other frameworks adopted by countries at the global level. However, there is no one-size-fits-all approach to be applied and, as such, each country needs to define at the domestic level what would be the most appropriate way to address such implementation. Furthermore, one of the key characteristics of the 2030 Agenda is that governments, private sector, civil society and United Nations agencies, among others, will need to work together for its successful realization.

To illustrate the challenges ahead, the SDGs most directly related to agriculture and biodiversity, Goal 2 and 15 respectively, are described below. SDG 2 aims to "end hunger, achieve food security and improved nutrition and promote sustainable agriculture". It includes a series of targets such as doubling the agricultural productivity and income of small-scale food producers, ensuring sustainable food production systems and implementing resilient agricultural practices, and maintaining the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild relatives. On the other hand, SDG 15 aims to "protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss". Among others, some of the targets included under this goal refer to reducing the degradation of natural habitats, integrating ecosystem and biodiversity values into development processes, and promoting fair and equitable sharing of benefits arising from the utilisation of genetic resources.

A wide range of policy approaches, tools and institutional arrangements such as spatial planning, environmental-economic accounting for agriculture, or establishing cross-sectoral working groups/committees or equivalent mechanisms can support the fulfilment of different objectives. Furthermore, the implementation of Multilateral Environmental Agreements such as the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity, and FAO International Treaty on Plant Genetic Resources for Food and Agriculture can also provide an opportunity for a coherent and mutually supportive implementation among agriculture and biodiversity sectors.

The objective of session 4 is therefore to enter into more detailed discussions on what the priorities are for the biodiversity and agriculture sectors as well as the resulting trade-offs and how to deal with them, with a view to identifying common priorities and potential pathways to move forward in an integrated manner.

Examples of key resources relevant to this session include:

- *Report of the international expert workshop on biodiversity mainstreaming* (2015): In preparation for COP 13, the government of Mexico and the CBD Secretariat convened an International Expert Workshop on Mainstreaming Biodiversity (17-19 November 2015, Mexico City). With a view to informing discussions in the context of CBD, the report includes a summary of elements, challenges and opportunities that characterise the integration of agriculture and biodiversity sectors. General aspects relating to enabling conditions, policies, tools and institutional arrangements that can be applied to promote mainstreaming biodiversity into any sector, are also included. The full report of the workshop is available at https://www.cbd.int/doc/meetings/sbstta/sbstta-20/information/sbstta-20-inf-52-en.pdf

- Given the focus of CBD COP13 on mainstreaming of biodiversity into the agriculture, fisheries, forestry and tourism sectors, countries had discussions on this topic in the recently held CBD Subsidiary Body on Scientific, Technical and Technological Advice and Subsidiary Body on Implementation meetings. For these meetings, the CBD Secretariat prepared a *Voluntary guidance for mainstreaming of biodiversity across sectors including agriculture, forestry and fisheries: tools, guidance, frameworks, standards and platforms to move towards more sustainable practices* (UNEP/CBD/SBSTTA/20/INF/55 or UNEP/CBD/SBI/1/INF/44). The document includes a list of tools, frameworks and platforms that have been developed to support mainstreaming biodiversity into the agriculture, forestry and fisheries sectors. In addition to the tools developed by international organizations, the final section of the document also includes a list of examples of policy measures and good practices promoting mainstreaming in specific countries. The document is available at https://www.cbd.int/doc/meetings/sbstta/sbstta-20/information/sbstta-20-inf-55-en.pdf

- The FAO Council, on behalf of the Conference adopted in November 2011 the *Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture* with the aim to promote and ensure the conservation and sustainable use of plant genetic resources for food and agriculture, among others. Updating the rolling Global Plan of Action also strengthens its role as a supporting component of the International Treaty on Plant Genetic Resources for Food and Agriculture. The Global Plan of Action establishes eighteen priority activities related to in situ and ex situ conservation and management, sustainable use, and institutional and human capacities.
  Available at http://www.fao.org/agriculture/crops/thematic-sitemap/theme/seeds-pgr/gpa/en/

- The *Global Plan of Action for Animal Genetic Resources* and the *Interlaken Declaration* were adopted by the International Technical Conference on Animal Genetic Resources for Food and Agriculture in 2007. The FAO Conference subsequently endorsed it. The Global Plan of Action, rolling plan initially intended for a ten-year period, sets provisions for the sustainable use, development and conservation of animal genetic resources, at national, regional and global levels. It establishes a series of strategic priority actions related to characterization, inventory and monitoring of trends and associated risks, sustainable use and development, conservation, and policies, institutions and capacity-building, aimed at reversing trends of erosion and underutilization of animal genetic resources.
  The Global Plan Action and the Interlaken Declaration are available at http://www.fao.org/docrep/010/a1404e/a1404e00.htm

- *Mainstreaming Biodiversity in Practice – A STAP advisory document*: This document reviews the concept of biodiversity mainstreaming, to promote best practices in GEF projects focused on production landscapes and seascapes, to assess the effectiveness of such interventions, and the lessons learned following investments totalling over US$ 1.6 billion made since 2003 by the GEF in over 300 mainstreaming projects in 135 countries. Case studies and perspectives on mainstreaming are also included. The report concludes that while progress has been made to mainstream biodiversity into broader policy and practice areas, it is clear that greater care needs to be brought to the design, implementation, and assessment of mainstreaming projects to inform and improve future efforts. The document is available at http://www.stapgef.org/stap/wp-content/uploads/2014/04/Mainstreaming-Biodiversity-LowRes.pdf

- *A Rapid Diagnostic Tool: Biodiversity Mainstreaming - Integrating Biodiversity, Development and Poverty Reduction*: The 10th Conference of Parties to the Convention on Biological Diversity (CBD) urged Parties to revise and update their National Biodiversity Strategies and Action Plans (NBSAPs) in line with the new Strategic Plan for Biodiversity 2011-2020 and to

"…use the revised and updated national biodiversity strategies and action plans as effective instruments for the integration of biodiversity targets into national development and poverty reduction policies and strategies…" (Decision X/2). This rapid diagnostic tool is intended to help policy makers and other stakeholders understand the extent to which biodiversity and development objectives are already integrated at the national level and the obstacles and constraints that need to be overcome to promote further, and more effective, integration. Available at http://pubs.iied.org/G03694.html

4.3 Planning for a changing climate (session 5)

In December 2015, governments achieved a historic milestone, the Paris Agreement[5], with the objective of limiting the increase in the global average temperature to well below 2 °C, and pursuing efforts to limit the temperature increase to 1.5 °C, above pre-industrial levels. Importantly, this new agreement not only affirms the need that food production is not threatened by the responses to address climate change but also recognises the importance of maintaining the integrity of ecosystems and conserving biodiversity. Nationally determined contributions, which are measures and targets that will be implemented by all UNFCCC Parties, form the basis for the agreement.

When referring to the relationship between agriculture and climate change, it is recognised that agriculture both generates a significant proportion of anthropogenic greenhouse emissions and is also vulnerable to the effects of climate change.[6] Although as indicated by the Intergovernmental Panel on Climate Change (IPCC), there is available information with respect to the individual impacts of phenomena such as climate change, habitat loss and fragmentation and overharvesting, not a lot is known about their combined consequences.[7] This is an area that still needs to be advanced so to enable a full consideration of those aspects within decision-making processes.

Models linking agriculture and climate change are used to understand how both dimensions interact between each other. Despite the increasing scientific knowledge that has been generated in the last decades, there is still a degree of uncertainty that makes the case to continue investing in research, particularly to better understand the interlinkages between biodiversity, agriculture and climate change.

In addition to the work being undertaken within the UNFCCC, countries and other stakeholders have also been actively engaged in other intergovernmental processes that deal with some specific dimensions of the relationship between climate change and agriculture. Some of these include, for example, a series of policy recommendations[8] on food security and climate change adopted in 2012 by the Committee on World Food Security, and the Programme of Work on

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[5] UNFCCC, Paris Agreement. Available at http://unfccc.int/files/meetings/paris_nov_2015/application/pdf/paris_agreement_english_.pdf

[6] Smith, P., Bustamante, M., Ahammad, H., Clark, H., Dong, H., Elsiddig, E. A., … Tubiello, F. (2014). Agriculture, Forestry and Other Land Use (AFOLU). In O. Edenhofer, R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, … J. C. Minx (Eds.), *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 811–922). Cambridge, United Kingdom and New York, USA: Cambridge University Press. Retrieved from http://www.ipcc.ch/report/ar5/wg3/

[7] Settele, J., Scholes, R. J., Betts, R., Bunn, S., Leadley, P., Nepstad, D., … Toboada, M. A. (2014). Chapter 4. Terrestrial and Inland Water Systems. In C. B. Field, V. B. Barros, D. J. Dokken, K. J. Mach, M. D. Mastandrea, T. E. Bilir, … L. . White (Eds.), *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 271–359). Cambridge, United Kingdom: Cambridge University Press. doi:31 March 2014

[8] See http://www.fao.org/docrep/meeting/026/me590e.pdf, paragraphs 9-11

Climate Change and Genetic Resources for Food and Agriculture (2013-2017)[9] adopted by the Commission on Genetic Resources for Food and Agriculture in 2013.

The interrelation between trade, agriculture and biodiversity is a crucial issue that needs to be fully comprehended. Despite the fact that an increasing number of voluntary standards are being adopted around the world, there is no certainty about the actual impacts that they have either in terms of biodiversity conservation and sustainable use, or with respect to local populations. As specifically acknowledged in the 2030 Agenda, where trade is considered as one of the means of implementation, the international community reinforced the interpretation of international trade as an engine for development. Furthermore, the relationship between trade and environment has been long-standing in the international agenda, particularly through the work by the World Trade Organization, which is highly relevant for CBD's work in the area of incentives.

Examples of key resources relevant to this session include:

- The *Summary for policymakers of the assessment report on the methodological assessment of scenarios and models of biodiversity and ecosystem services* (2016) was recently adopted by the Plenary of the Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Services (IPBES). The Summary briefly describes the main thematic areas covered by the methodological assessment, which was developed to provide guidance for the use of scenarios and models (including those that consider climate change) in regional, global and thematic environmental assessments. The document is available at http://www.ipbes.net/sites/default/files/downloads/pdf/SPM_scenarios_advance.pdf

- In 2015, the Conference of FAO, the highest governing body of the organization, approved[10] the *Voluntary Guidelines to Support the Integration of Genetic Diversity into National Climate Change Adaptation Planning* that were developed under the guidance of the Commission on Genetic Resources for Food and Agriculture with the objective of assisting countries in managing genetic resources as a key element in adapting agricultural and food production systems to climate change. Available at http://www.fao.org/3/a-i4940e.pdf

- *The Resilience, Adaptation and Transformation Assessment Framework: From theory to application - Discussion paper for the Scientific and Technical Advisory Panel of the Global Environment Facility* (2015): The concepts of resilience, adaptation and transformation are gaining prominence and being translated into aspirational goals that guide policy development. Understanding those terms is critical to meeting the SDGs, particularly those related to climate change adaptation, food security, and safeguarding ecosystem functions. Devising interventions to embed resilience goals into project planning requires methods to evaluate resilience, and identify needs with respect to adaptation and transformation. In that respect, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in partnership with STAP developed the Resilience Adaptation Transformation Assessment (RATA) Framework. It provides a tool to align approaches and monitoring towards common objectives, contribute to integrated strategies, and pursue synergies in reporting between the Rio Conventions (i.e. CBD; the United Nations Convention to Combat Desertification, UNCCD; and the United Nations Framework Convention on Climate Change, UNFCCC). The full version of the document is available at http://www.stapgef.org/stap/wp-content/uploads/2015/03/CSIRO-STAP-Resilience-Adaptation-Transformation-Assessment-Framework-Report.pdf Complementary material: *Designing projects in a rapidly changing world: Guidelines for embedding resilience, adaptation and transformation into*

[9] See http://www.fao.org/3/a-bl009e.pdf

[10] Report of the 39th session of the Conference of FAO available at http://www.fao.org/3/a-mo153e.pdf

sustainable development projects – A STAP advisory document (Version 1.0) (2016) available at http://www.stapgef.org/stap/wp-content/uploads/2016/05/RaptaGuidelines-A4-WEB-High-FINAL.pdf

- *Climate change and food security: risks and responses* (2016): The report aims to inform the ongoing discussions on how to operationalize adaptation of agriculture and food systems, including agricultural biodiversity, to climate change. As such, it also aims to answer the adaptation needs and demands conveyed by many countries in their Intended Nationally Determined Contributions under the UNFCCC that informed the Paris Agreement. The aim of this paper is to provide an overview of the effects of climate change on food security and nutrition, intended as its four dimensions, and to explore ways to reduce negative impacts through adaptation and resilience. As such, the scope of the paper does not cover greenhouse gas (GHG) emissions from the agriculture sectors nor means to reduce them. The document is available at http://www.fao.org/3/a-i5188e.pdf

4.4 Changing practices (session 8)

As reflected in the headline of this Conference, analysing the interlinkages between biodiversity and agriculture require thinking about agriculture and food systems that, depending on the definition that is used, include all or some of the following stages: production, processing, distribution, consumption and disposal. Multiple stakeholders, such as FAO and the Committee on World Food Security, are working on a range of aspects linked to sustainability throughout these stages. However, the extent to what sustainability and biodiversity are related, and how they link to the delivery of sustainable agriculture needs to be further discussed.

Farmers are key actors responsible for managing biodiversity and making everyday decisions with respect to the food that is being produced around the world. Consequently, a deep understanding of their motivations would enable designing and implementing measures that demonstrate to be feasible. Considering "on the ground" reality is an important pre-condition for the success of policies or programmes that aim to promote sustainable agriculture, particularly one in which biodiversity is at its core. However, broadly speaking, models used to understand the relationship between agriculture and a specific environmental problem such as climate change, still consider farmers' behaviours as an assumption.[11] The development of these models through participatory approaches could make the use of the resulting information more salient, credible and legitimate for decision-making processes.

For any change to be achieved, the appropriate incentives need to be put in place. CBD recognises this by requiring Parties "to adopt economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biological diversity".[12] According to the fourth edition of the Global Biodiversity Outlook (GBO-4), governments are still providing subsidies harmful to biodiversity, and while agricultural subsidies are increasingly shifting towards positive incentives for biodiversity conservation, there is no conclusive evidence on whether these incentives will achieve their aims.[13] In particular, one of the conclusions of the

[11] Porter, J. R., Xie, L., Challinor, A. J., Cochrane, K., Howden, S. M., Iqbal, M. M., … Travasso, M. I. (2014). Food Security and Food Production Systems. In C. B. Field, V. R. Barros, D. J. Dokken, K. J. Mach, M. D. Mastandrea, T. E. Bilir, … L. L. White (Eds.), *Climate Change 2014: Impacts, Adaptations, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (pp. 485–533). Cambridge, United Kingdom and New York, USA: Cambridge University Press.

[12] Convention on Biological Diversity, article 11.

[13] Secretariat of the Convention on Biological Diversity (2014) *Global Biodiversity Outlook 4*. Montréal, 155 pages. Available at https://www.cbd.int/gbo/gbo4/publication/gbo4-en.pdf

report suggests that agri-environmental schemes and other policy instruments should be better targeted towards desired biodiversity outcomes.

Examples of key resources relevant to this session include:

- "The Economics of Ecosystems and Biodiversity for Agriculture and Food" (TEEBAgFood) identifies the values that well-functioning biodiversity and ecosystems ('natural capital'), skills & knowledge ('human capital'), finance and machinery ('physical capital') and societal interactions, relationships, formal and informal institutions ('social capital') bring to the food systems, and how these systems depend on them. Equally, it identifies the impacts of diverse food and agricultural systems on natural, human and social capital stocks, which comprise the most significant parts of the wealth of nations. The *TEEBAgriFood Interim Report*, available at http://img.teebweb.org/wp-content/uploads/2015/12/TEEBAgFood_Interim_Report_2015_web.pdf, presents the initial results of some exploratory studies as well as an overview of selected production systems with the objective of illustrating what different food systems look like, interactions with the environment and society and finally present some preliminary and indicative value estimates of the use of social and natural capital in specific contexts.

- *CBD Technical Series No. 56, Incentive measures for the conservation and sustainable use of biological diversity – Case studies and lessons learned* includes case studies and good practices related to the identification and removal or mitigation of perverse incentive measures (i.e. incentive measures with harmful effects on biodiversity) as well as to the promotion of positive incentive measures. Document available at https://www.cbd.int/doc/publications/cbd-ts-56-en.pdf

- Sustainability Assessment of Food and Agriculture systems (SAFA) Guidelines version 3.0. SAFA is a framework for the assessment of sustainability along agri-food value chains. It establishes an international reference for assessing trade-offs and synergies between all dimensions of sustainability throughout those chains. It was prepared so that small, medium and large-scale companies, organizations and other stakeholders that participate in crop, livestock, forestry, aquaculture and fishery value chains (i.e. involved with the production, processing, distribution and marketing of goods) have a clear understanding of the diverse components of sustainability and how strength, weakness and progress could be tackled. The SAFA Guidelines were developed through a participatory process that involved a variety of stakeholders. They are available at http://www.fao.org/3/a-i3957e.pdf

5. Panel session: Practical examples of building interlinkages between biodiversity and agriculture (session 7)

This panel session aims to foster dialogue among different stakeholders involved in managing, or regulating the management of, the use of biodiversity for agricultural production. Consequently, it will include panellists from governments, private sector and non-governmental organizations that will briefly present what is being done in their respective areas of work to contribute to the conservation and sustainable use of biodiversity so to deliver sustainable agriculture.

A selection of practical examples on how the relationship between biodiversity and agriculture is being addressed in different contexts will be briefly presented by panellists. Based on their experience, they will identify some of the key benefits, challenges and limitations associated with approaches that aim to create links between these two sectors. Further experience will be

sought from meeting participants, who will be invited to further explore the issues with the panel.

6. Roundtable discussions (sessions 6 and 9)

Two interrelated roundtable discussions will be organized. The primary purpose of the roundtable discussions is to increase the engagement of meeting participants through work in smaller groups to identify and develop options and potential pathways to enhance the interlinkages between biodiversity and agriculture. In particular, these options and potential pathways will refer to elements that could be considered when developing actions or designing measures to comply with the full range of objectives and targets agreed by countries at the global level.

The intention is that these discussions will identify ways to enhance the links between biodiversity and agriculture, and thereby provide inputs to the high-level segment of CBD COP13. Furthermore, the roundtable discussions will offer an inspiring space to enable participants of the Trondheim Conference to personally reflect on, elaborate on and take away ideas and practical examples shared by a wide range of stakeholders, based on their experiences.

The following guiding questions will be considered by the roundtables:

1. *What mechanisms are used at the national level to address the relationship between the conservation and sustainable use of biodiversity and agriculture development? For example, what are the related policy tools, approaches and institutional settings?*

2. *Where does biodiversity fit in within the promotion of sustainable agriculture?*

3. *What is the most effective way of identifying and addressing trade-offs between agriculture and biodiversity priorities? At which level of the value chain, producer-consumer?*

4. *What are the main barriers/trade-offs that need to be considered when designing measures in the biodiversity and agriculture sectors at national level?*

5. *What actions and mechanisms (e.g. regulatory approaches, incentives) can be used to encourage the integration of biodiversity considerations into sustainable agriculture (i.e. to maximise the benefits to biodiversity and minimise the negative impacts caused by food production) while addressing the identified barriers/trade-offs at the national level?*

6. *What are the financial and technological gaps and needs that need to be addressed in order to promote and facilitate effective interlinkages between biodiversity and agriculture?*

7. *How are ongoing intergovernmental processes within different organisations/agreements currently contributing to the integration of biodiversity and agriculture priorities? Where are the gaps?*

7. Co-chairs' Summary and Conference Report

The findings, conclusions and recommendations of these deliberations will be captured in a Co-Chairs' Summary to be discussed on the final day of the Conference. The summary will be an important component of the Conference Report which will also reflect the proceeding of the Conference. The report will be presented to key meetings such as those under the CBD.

Annex 1. Aichi Biodiversity Targets

Strategic Plan for Biodiversity 2011-2020. Available at https://www.cbd.int/decision/cop/?id=12268

Strategic goal A. Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society

Target 1
By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.

Target 2
By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.

Target 3
By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.

Target 4
By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.

Strategic goal B. Reduce the direct pressures on biodiversity and promote sustainable use

Target 5
By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.

Target 6
By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.

Target 7
By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.

Target 8
By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.

Target 9
By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.

Target 10
By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.

Strategic goal C. Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

Target 11
By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes.

Target 12
By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.

Target 13
By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Strategic goal D: Enhance the benefits to all from biodiversity and ecosystem services

Target 14
By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.

Target 15
By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.

Target 16
By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

Strategic goal E. Enhance implementation through participatory planning, knowledge management and capacity-building

Target 17
By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.

Target 18
By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.

Target 19
By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.

Target 20
By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 2011-2020 from all sources, and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization, should increase substantially from the current levels. This target will be subject to changes contingent to resource needs assessments to be developed and reported by Parties.

Annex 2. Sustainable Development Goals (and targets for SDG 2 and 15)

Transforming our world: the 2030 Agenda for Sustainable Development. Available at http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/70/1&Lang=E

1. End poverty in all its forms everywhere

2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture

2.1 By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round

2.2 By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons

2.3 By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment

2.4 By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality

2.5 By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed

2.a Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries

2.b Correct and prevent trade restrictions and distortions in world agricultural markets, including through the parallel elimination of all forms of agricultural export subsidies and all export measures with equivalent effect, in accordance with the mandate of the Doha Development Round

2.c Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility

3. Ensure healthy lives and promote well-being for all at all ages

4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

5. Achieve gender equality and empower all women and girls

6. Ensure availability and sustainable management of water and sanitation for all

7. Ensure access to affordable, reliable, sustainable and modern energy for all

8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

10. Reduce inequality within and among countries

11. Make cities and human settlements inclusive, safe, resilient and sustainable

12. Ensure sustainable consumption and production patterns

13. Take urgent action to combat climate change and its impacts

14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development

15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

> 15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements
>
> 15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally

15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world

15.4 By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development

15.5 Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species

15.6 Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed

15.7 Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products

15.8 By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species

15.9 By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts

15.a Mobilize and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems

15.b Mobilize significant resources from all sources and at all levels to finance sustainable forest management and provide adequate incentives to developing countries to advance such management, including for conservation and reforestation

15.c Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities

16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

17. Strengthen the means of implementation and revitalize the global partnership for sustainable development

Annex 3. Non-Paper (Mexico): Elements for their possible inclusion in the Cancun Declaration on mainstreaming the conservation and sustainable use of biodiversity for well-being[14]

The Ministers of Environment, Agriculture, Forestry, Fisheries and Tourism, Parties to the Convention on Biological Diversity, meeting in Cancun, Mexico, on 3 December 2016

DECLARE

- Ethical argument
- Strong political and conceptual message where the commitment for mainstreaming the conservation and sustainable use of biodiversity is established.
    - ✓ The environmental dimension, particularly of biodiversity, in sustainable development, systemic issues, links between biodiversity, quality of life and human health
    - ✓ The role of ecosystems in regards to climate change (mitigation and adaptation)
    - ✓ Governance and solid institutions
    - ✓ Holistic national planning and coherence amongst objectives
    - ✓ Public policy (cross cutting approach and synergies)
    - ✓ Economic sectors
    - ✓ Sustainable production, consumption and trade
    - ✓ Partnerships
- Objectives for mainstreaming biodiversity: Maximize the contribution of biodiversity and ecosystem services to productive sectors, while reducing and mitigating the negative impacts of these sectors on biodiversity
- Political will

RECOGNIZE

- The 2030 Development Agenda and the Sustainable Development Goals, which highlight the importance of biodiversity to achieve them.
- That biodiversity comprises the diversity of living creatures, the genetic diversity within each species and the ecosystems they are part of, which have a great value for productive activities and a fundamental role for food security and human health, as well as offer solutions to social problems and challenges
- Need to urgently respond to the unprecedented environmental crisis that is threatening biodiversity and ecosystems, thereby compromising human development
- The role of the CBD, the Strategic Plan for Biodiversity 2011-2020 and its vision to 2050, as well as the Aichi Targets.
- The Gangweon Declaration and the Pyeongchang roadmap (COP-12)

[14] Available at https://www.cbd.int/cop/preparation/cop13-hls/default.shtml

COMMIT

- To work together across sectors within our governments and organizations, to mainstream biodiversity conservation and sustainable use into national strategies, plans, and policies
- Strengthen legal frameworks and institutions, as well as the role of national, subnational and local governments
- National biodiversity strategies and action plans (NBSAPs) as policy frameworks
- Scientific and technological knowledge on biodiversity for policy making, decision taking and monitoring
- Means of implementation, including capacity-building, reporting and evaluation, as well as availability of information to the public in order to ensure transparency and accountability
- International cooperation
- Mobilization of national and international financial resources, public as well as private
- Collaboration amongst organizations and agencies within the United Nations system, multilateral environmental agreements and existing initiatives
- CBD relevance for other conventions and international agreements
- Promote the active participation of all stakeholders from civil society
- Indigenous peoples and respect for traditional knowledge
- In the private sector, incentives for green growth, safe and sustainable biocommerce, bioprospecting and biotechnology, as well as regulation and information for enhanced accountability
- To work within a feasibility framework, regulation and incentives to promote biodiversity mainstreaming into public policy, legislation and institutions, as well as in the activities of the private sector through value chains , particularly in the following productive sectors:
  - ***Agriculture***: agricultural systems as reservoirs of agricultural biodiversity, indispensable for the present and the future; biodiversity role in food security, nutrition, and human health; ecological intensification; crop and livestock diversity; resource use efficiency
  - ***Forestry***: forests as reservoirs of biodiversity and as providers of goods and ecosystem services; landscape approach; sustainable forestry practices; incentives including payment for environmental services;
  - ***Fisheries***: fisheries for livelihoods and food security; ecosystem approach to fisheries; restoration of overfished areas; generation and use of knowledge and technological innovation for the monitoring and sustainable management of fisheries; reduce bycatch, discards and waste; marine protected areas;
  - ***Tourism***: sustainable tourism as a strategy for local and regional development; tourism services as catalysts for the adoption of practices of sustainable production and consumption; efficiency, innovation and adaptability; the promotion of the importance of biodiversity, ecosystem services, traditional knowledge and bio-cultural wealth among providers and users of tourist services.