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BIODIVERSITY AND BIOFUELS: IMPLEMENTATION OF DECISIONS

Note by the Executive Secretary

INTRODUCTION

1. In paragraph 11 of decision XI/27, the Conference of the Parties decided to review progress on the implementation of decisions IX/2 and X/37 at its twelfth meeting. The Executive Secretary has prepared this note to assist Parties in their considerations.
2. The key elements of decisions IX/2 and X/37, regarding action by Parties and/or organizations, are summarized below.
3. In decision IX/2, the Conference of the Parties agreed, inter alia, that biofuel production and use should be sustainable in relation to biological diversity, and recognized the need to promote the positive and minimize the negative impacts of biofuel production and its use on biodiversity and the livelihoods of indigenous and local communities. The decision called for, inter alia: (i) the development of sound policy frameworks for the sustainable production and use of biofuels making use of relevant tools and guidance under the Convention; (ii) continued investigation and monitoring of positive and negative impacts; (iii) strengthened development cooperation; (iv) the sharing of experiences on the development and application of tools; (v) participation in efforts carried out by various bodies other than the Convention on Biological Diversity; (vi) the private sector to improve social and environmental performance of the production of biofuels; (vii) participation in efforts carried out by various bodies, other than the Convention on Biological Diversity, who are addressing relevant matters; and (viii) the sharing of experiences and development of approaches and relevant tools.
4. In decision X/37, the Conference of the Parties, in the context of promoting the positive and minimizing or avoiding the negative impacts of biofuel production and use on biodiversity and impacts on biodiversity that affect related socioeconomic conditions, called for, inter alia: (i) the further development of voluntary conceptual frameworks for ways and means to promote the positive and minimize or avoid the negative impacts of biofuel production and use developed by three regional workshops; (ii) when carrying out scientific assessments, ensuring that the sustainable agricultural practices and food and energy security of indigenous and local communities are addressed and respected; (iii) the development and implementation of policies, in particular by assessing both direct and indirect effects and impacts on

* UNEP/CBD/COP/12/1/Rev.1.

biodiversity of the production and use of biofuels in their full life cycle as compared to that of other types of fuels; (iv) the development of national inventories so as to identify areas and, where appropriate, ecosystems that could be used in, or exempted from, the production of biofuels; (v) the elaboration of supportive measures to promote positive and minimize or avoid negative impacts, taking into account the tools and guidance referred to in paragraph 3 of decision IX/2; (vi) addressing impacts in developing and implementing land-use and water policies and other relevant policies and/or strategies, in particular by addressing direct and indirect land use and water use; (vii) the development and use of environmentally sound technologies, and support for the development of research programmes and to undertake impact assessments; and (viii) the inclusion of ways and means to promote the positive and minimize or avoid the negative impacts of biofuel production and use on biodiversity, and on indigenous and local communities, in national plans, such as national biodiversity strategies and action plans and national development plans.

5. The subsequent sections of the note report on activities to implement decisions IX/2 and X/37 of the Executive Secretary, partners and Parties respectively.

I. ACTIVITIES OF THE EXECUTIVE SECRETARY

6. In addition to the above elements of decisions IX/2 and X/37, the decisions also made a number of requests to the Executive Secretary which include, inter alia, to: (i) compile, analyse, summarize and disseminate information on relevant tools for voluntary use; (ii) compile information on gaps in available standards and methodologies; (iii) contribute to and assist with the ongoing work of relevant partner organizations and processes; and (iv) carry out his work taking into account the work of, and in collaboration with, relevant partner organizations and processes.

7. A progress report on this work was submitted to the sixteenth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) in documents UNEP/CBD/SBSTTA/16/14 and UNEP/CBD/SBSTTA/16/INF/32. This included summaries, based on information, experiences and case studies provided by Parties and relevant organizations, of key gaps in tools and approaches; sustainability criteria and certification schemes; life-cycle analysis including assessments of biofuels against other renewable energy options; land-use aspects of biofuels production and use, including growing biofuels on degraded lands and direct and indirect land-use change; incentives including fuel targets, subsidies and other economic measures; other gaps identified, including impacts of biofuels on related socioeconomic conditions and sociopolitical drivers of biofuels policy; and a report on his efforts regarding the ongoing work of partners, in particular the Global Bioenergy Partnership and the Roundtable on Sustainable Biofuels. This information supported SBSTTA recommendation XVI/13 and was considered at the eleventh meeting of the Conference of the Parties resulting in decision XI/27.

8. The work of the Executive Secretary is ongoing with regard to activities that were not time-bound in decisions IX/2 and X/37. The CBD website contains relevant information on available tools and approaches for the sustainable production and use of biofuels, with regards to biodiversity.¹ The Executive Secretary has produced CBD Technical Series 65: *Biofuels and Biodiversity*² based on an update of information provided in document UNEP/CBD/SBSTTA/16/INF/32.

II. ACTIVITIES OF RELEVANT PARTNER ORGANIZATIONS AND PROCESSES

9. Progress in the work of relevant partner organizations and processes, as of 2012, was reported by the Executive Secretary in document UNEP/CBD/SBSTTA/16/INF/32. The following is an update on the progress being made by some partners. This information is by no means comprehensive, and is included

¹ <http://www.cbd.int/agro/biofuels/tools.shtml>.

² <http://www.cbd.int/doc/publications/cbd-ts-65-en.pdf>.

as an indication of the extent of efforts beyond the Convention on Biological Diversity. It is useful to highlight that there is evidence, including as noted below, that decisions IX/2 and X/37 (and discussions held under the Convention leading to these decisions) have contributed significantly to raising awareness of, and attention to, biodiversity as an important dimension of the sustainability of biofuels.

Global Bioenergy Partnership (GBEP)

10. GBEP Partners selected the following priority areas for their immediate programme of work:³ (i) facilitate the sustainable development of bioenergy supported by the Sustainability Indicators for Bioenergy⁴ (these reference decision X/37, and a Task Force is now proceeding with piloting projects for the indicators both at the national level and through cooperation projects in Ghana, Colombia and Indonesia); (ii) test a common methodological framework on greenhouse gas emission reduction measurement from the use of bioenergy (a Task Force is implementing the framework which may become a useful tool for domestic measurement, reporting and verification set out in the Copenhagen Accord,⁵ for bioenergy projects); (iii) facilitate capacity-building for sustainable bioenergy, particularly greenhouse gas methodologies and on sustainability, through country driven activities and projects through multiple means, including workshops, study tours, public forums and other ways to present sustainable practices and assess resources (the main focus is to facilitate collaboration among GBEP Partners and Observers for capacity-building projects and related activities; the Working Group is also facilitating cooperation and capacity-building through sharing information, stimulating discussion, and identifying opportunities for cooperation on sustainable bioenergy development and deployment, as well as encouraging sharing of lessons learned, identifying and disseminating information about existing tools and resources available from both the public and private sources and facilitating appropriate linkages between them); and (iv) raise awareness and facilitate information exchange on bioenergy to increase the understanding of issues related to bioenergy development.

*Roundtable on Sustainable Biomaterials (RSB)*⁶

11. The Roundtable on Sustainable Biofuels, originally set up in 2007 to ensure the sustainability of liquid biofuels for transport, expanded its scope in 2013 to cover biomaterials, which include bioenergy and bio-based products such as bioplastics and lubricants. Operators seeking RSB certification may use either the *RSB Consolidated EU RED Standards* (for the European Union) or the *RSB Global Standards* (for the rest of the world). The RSB Standards are constantly evolving. As new technology, research and sustainability issues emerge, the RSB works with its members to adapt the standards. The standards include those with regard to direct impact on biodiversity. Greenhouse gas emissions from indirect land-use change, i.e. that arise through macroeconomic effects of biofuels production, shall be minimized although there remains no broadly accepted methodology to determine them. Practical steps that shall be taken to minimize these indirect effects will include maximizing use of waste and residues as feedstocks; using marginal, degraded or previously cleared land; improvements to yields and efficiency of crops; international collaboration to prevent detrimental land-use changes; and avoiding the use of land or crops that are likely to induce negative land-use conversion. Guidance is available on these standards and criteria based on principles regarding the following: legality (which includes reference to the Convention on Biological Diversity and the Ramsar Convention on Wetlands); planning, monitoring and continuous improvement; greenhouse gas emissions; human and labour rights; rural and social development; local food security; conservation; soil; water; air; use of technology, inputs, and management of waste; and land rights.

³ <http://www.globalbioenergy.org/programmeofwork/priority-areas/en/>.

⁴ http://www.globalbioenergy.org/fileadmin/user_upload/gbep/docs/Indicators/The_GBEP_Sustainability_Indicators_for_Bioenergy_FINAL.pdf.

⁵ UNFCCC decision 2/CP.15.

⁶ <http://rsb.org>.

Food and Agriculture Organization of the United Nations (FAO)

12. Activities of the FAO specifically regarding biofuels include the Bioenergy and Food Security Approach,⁷ which is supported by an implementation guide produced in 2014.⁸ The components and related tools and guidance can be applied at national and subnational levels (e.g. regional, district, community, etc.) and at project level. Key questions the approach addresses include: Where could crops for bioenergy be produced without encroaching on protected areas or adversely affecting biodiversity? and: Can there be a sustainable expansion of the agricultural area, taking into consideration competing demands for land, especially for food production and biodiversity conservation?

13. However, the most relevant work of the FAO is on broader, cross-sectoral, landscape-scale sustainability of agriculture, forestry and fisheries/aquaculture within which bioenergy is a subcomponent. Decision XI/27 noted that many technical and scientific issues associated with biofuels are difficult to assess and that they are relevant to many programmes of work of the Convention, in particular the ecosystem approach, and that these issues may be addressed in a broader context.

International Energy Agency (IEA)

14. IEA Bioenergy's vision is to achieve a substantial bioenergy contribution to future global energy demands by accelerating the production and use of environmentally sound, socially accepted and cost-competitive bioenergy on a sustainable basis, thus providing increased security of supply while reducing greenhouse gas emissions from energy use. Recent reports of its work include Monitoring Sustainability Certification of Bioenergy;⁹ Examining Sustainability Certification of Bioenergy – Short Summary (2013),¹⁰ providing a good summary of status of the topic; and reports on a survey on governance and certification of sustainable biomass and bioenergy (2012)¹¹ and impacts of sustainability certification on bioenergy markets and trade (2013).¹²

15. The main findings of a report on recommendations for improvement of sustainability certified markets in 2013¹³ include that more concrete common principles of sustainable use of biomass for energy, as found in several initiatives aiming at the certification of biomass, biofuels and bioenergy, are: sustainable production (raw materials for biofuels may not come from land that has been converted, e.g. primary forest, protected area, highly biodiverse grassland, areas with high stocks of carbon, or peatlands, and must come from legal sources; raw materials in the EU must be cultivated in accordance with the Common Agricultural Policy and/or correspond to criteria or guidelines for Sustainable Forest Management); high greenhouse gas performance compared to fossil fuels; contribute to local prosperity and welfare; conversion and logistics may not lead to negative impacts on soil, water and air quality; efficient energy conversion; the protection of biodiversity, whereby the production of biomass may not negatively affect biodiversity; and no other environmental impacts.

16. The World Energy Outlook 2013 - Renewable Energy Outlook,¹⁴ projects the consumption of biofuels to increase from 1.3 mboe/d¹⁵ in 2011 to 4.1 mboe/d in 2035, to meet 8 per cent of road-transport fuel demand in 2035. The United States of America, Brazil, the European Union and China make up for more than 80 per cent of all biofuels demand. Advanced biofuels, helping to address sustainability

⁷ <http://www.fao.org/energy/befs/en/>.

⁸ <http://www.fao.org/docrep/019/i3672e/i3672e.pdf>.

⁹ <http://www.ieabioenergy.com/wp-content/uploads/2013/10/Monitoring-Sustainability-Certification-of-Bioenergy-Short-summary.pdf>.

¹⁰ <http://www.bioenergytrade.org/downloads/iea-sust-cert-task-1-final2013.pdf>.

¹¹ <http://www.bioenergytrade.org/downloads/iea-sust-cert-task-2-final2013.pdf>.

¹² <http://www.bioenergytrade.org/downloads/iea-sust-cert-task-3-final2013.pdf>.

¹³ <http://www.bioenergytrade.org/downloads/iea-sust-cert-task-4-final2013.pdf>.

¹⁴ http://www.worldenergyoutlook.org/media/weowebiste/2013/WEO2013_Ch06_Renewables.pdf.

¹⁵ mboe/d = million barrels of oil equivalents per day.

concerns about conventional biofuels, gain market share after 2020, reaching 20 per cent of biofuels supply in 2035.

United Nations Environment Programme (UNEP)

17. UNEP's work on bioenergy¹⁶ is positioned at the crossroads of different policy areas, where bioenergy requires informed and long-term decisions on trade-offs and coordination among energy, agriculture, transport, environment, and trade policies. To enable such informed decisions, UNEP is working to improve the analytical basis. In promoting specific options, new environmental and social problems should not be created while trying to solve existing ones. A comprehensive set of policies needs to be put in place so that bioenergy is produced in manners that ensure sustainability both on a national policy level and a project level. An internationally agreed system is recognized as one solution to encourage that bioenergy commodities are produced sustainably, without destroying the sector's prospects. Achieving this delicate balance is a challenge. UNEP works to improve the understanding of the interrelations at a policy level where balancing different interests (i.e. between energy, agriculture, environment, transport, trade, resource efficiency, etc.) requires trade-offs. Cooperation of and with different stakeholder groups is critical to approaching these challenges. Recognized key risks from biofuel production and use include risks to biodiversity, water, food security, land tenure, social and human welfare. The Biofuels Vital Graphics: Powering a Green Economy¹⁷ creatively illustrates the opportunities that biofuels can provide as well as the risks that need to be mitigated.

18. The Global Environment Facility (GEF) Research Project on "Global Assessments and Guidelines for Sustainable Liquid Biofuel Production in Developing Countries" identified and assessed sustainable systems for the production of liquid biofuels both for transport and stationary applications. The project developed a Biofuels Screening Toolkit, which can be used by the GEF and other actors to address sustainability issues concerning biofuels, including life-cycle greenhouse gas assessment, economic and social sustainability, environmental risks such as biodiversity, water and soil quality, and food security. The final report (March 2013)¹⁸ includes global non-greenhouse-gas environmental impacts of biofuels, with sections on environmental standards, criteria and indicators for biofuels; methodological approach; sustainable resource use, including indicators for land-use efficiency and secondary resource use efficiency; biodiversity and land use; soil; water and air.

III. INFORMATION FROM FIFTH NATIONAL REPORTS ON ACTIVITIES OF PARTIES

19. Paragraph 5 of decision X/37 recognized the need to include ways and means to promote the positive and minimize or avoid the negative impacts of biofuel production and use on biodiversity, and on indigenous and local communities, in national plans, such as national biodiversity strategies and action plans and national development plans, and invited Parties, as appropriate, to report in this regard as part of their fifth national reports under the Convention on Biological Diversity.

20. Paragraph 4 of decision XI/27 invited Parties to include in their fifth nation reports information on the (i) consideration of relevant biofuel matters, when and if appropriate, when updating and implementing their national and subnational biodiversity strategies and action plans and other relevant policies; (ii) consideration of the use of various relevant voluntary tools regarding the impact of the production and use of biofuels on biodiversity, such as in strategic environment and socioeconomic assessment and integrated land-use planning in accordance with national circumstances; and (iii) the development of national inventories so as to identify areas of high biodiversity value, critical ecosystems,

¹⁶ <http://www.unep.org/bioenergy/>.

¹⁷ http://www.unep.org/bioenergy/Portals/48107/publications/VBG_Ebook%20FINAL.pdf.

¹⁸ <http://www.unep.org/bioenergy/Portals/48107/publications/Global%20Assessment%20and%20Guidelines%20for%20Biofuels.pdf>.

and areas important to indigenous and local communities and assessment, and identification of areas and, where appropriate, ecosystems that could be used in, or exempted from, the production of biofuels.

21. All fifth national reports (92)¹⁹ available as of 9 August 2014 were reviewed with regard to any relevant information on biofuels, focusing on larger-scale deployment and in particular regarding liquid biofuels used mainly in the transport sector.

Integration of biofuels into relevant national policies

22. Member States of the European Union (EU) must comply with sustainability requirements of the Renewable Energy Directive 2009/28/EC, and related instruments, for the production and use of energy which include provisions with regard to sustainability requirements for biofuels (described in more detail in documents UNEP/CBD/SBSTTA/16/14 and UNEP/CBD/SBSTTA/16/INF/32). Germany, Norway, the Netherlands and Belgium make specific reference to this EU directive and to the fact that national policies and legislation have been, or are being, adjusted to comply. Member States must also report to the European Commission on a biannual basis on the impact of biofuels and bioliquids on biodiversity, water resources, water and soil quality, greenhouse gas emission reduction and changes in commodity prices and land use associated with biomass production.

23. In Germany, a government ordinance has been enacted on the sustainable cultivation and use of biofuels (Sustainability Ordinance) as a precondition for tax concessions and crediting against quotas. The National Biodiversity Strategy includes the target “The generation and use of renewable energy is not at the expense of biological diversity”. A number of supporting measures are also reported, such as the restriction of crop rotation, and biogas production from energy maize in particular is to be counteracted by, among other things, the introduction of a “maize cap” that limits the use of certain maize and cereal substrates in new biogas installations to a maximum of 60 per cent by weight. An Act has increased payments for energy crops of special ecological value, and greater incentives to exploit the potential of waste and residual substances, in order to reduce competition for land and further increase the climate contribution of bioenergy use.

24. The United Kingdom of Great Britain and Northern Ireland (UK) reports on the independent business-led Ecosystem Markets Task Force set up to review the opportunities for UK business from expanding green goods, services, products, investment vehicles and markets which value and protect nature’s services. The Task Force reported to the Government in March 2013, setting out opportunities for the natural environment and growth. The Government Response (published in September 2013) covers all 22 recommendations made by the Task Force, including its top five priorities: biodiversity offsetting; bioenergy and anaerobic digestion; sustainable local woodfuel; nature-based certification and labelling; and water-cycle catchment management.

25. In Bulgaria, among the sustainability criteria in the Third National Action Plan on Climate Change 2013–2020 is the requirement that raw fuels are not produced on land with high carbon stock, on land with high biodiversity or in areas essential for conservation of biodiversity and sites in the EU Natura 2000 network.

¹⁹ Albania, Algeria, Australia, Azerbaijan, Belarus, Belgium, Benin, Bosnia and Herzegovina, Bulgaria, Burkina Faso, Burundi, Cameroon, Canada, Chad, China, Colombia, Comoros, Congo, Costa Rica, Côte d’Ivoire, Croatia, Cuba, Cyprus, Czech Republic, Democratic Republic of Congo, Denmark, Dominica, Ecuador, Equatorial Guinea, Estonia, Ethiopia, European Union, Fiji, Finland, France, Gambia, Germany, Guinea-Bissau, Honduras, Hungary, India, Iraq, Italy, Japan, Kazakhstan, Kuwait, Liberia, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mongolia, Montenegro, Morocco, Myanmar, Namibia, Nauru, Nepal, Netherlands, New Zealand, Niger, Nigeria, Niue, Norway, Pakistan, Palau, Poland, Qatar, Republic of Korea, Republic of Moldova, Russian Federation, Rwanda, Sao Tome and Principe, Saudi Arabia, Senegal, Solomon Islands, Somalia, South Africa, Spain, Sudan, Sweden, Switzerland, Tajikistan, Togo, Tonga, Uganda, United Arab Emirates, United Kingdom of Great Britain and Northern Ireland, United Republic of Tanzania, Uruguay, Vanuatu.

26. In Finland, forest management recommendations for the harvesting and growing of energy wood were published in 2010 and an extensive package of new forest acts and related decrees has entered into force in the beginning of 2014.

27. The strategy for the energetic use of biomass in Switzerland defines the most important principles and goals and points out fields of action and instruments for implementation. From a biodiversity point of view, the use of biomass for energy production shall avoid negative impacts on food production and biodiversity, and the use of biomass for energy production should lead to an improved environmental performance when compared to the use of conventional technologies.

28. Azerbaijan reports introducing state subsidies for cultivation costs associated with biofuels crops although it is unclear if these are to reduce negative impacts on biodiversity.

29. The Natural Capital Agenda of the Netherlands includes an international approach to meet the criteria for sustainable trade for the most important agricultural commodities with large impact on biodiversity by 2020. Actions focus on wood, genetic plant material and biomass for energy, and farming practices mainly produced and carried out in other parts of the world. In the last four years, the Netherlands has played an important role in debates around the negative environmental and social effects, particularly in (sub-) tropical countries, of the EU climate mitigation policies to blend fossil fuels and biofuels.

30. India reports strengthened efforts for partial substitution of fossil fuels by biofuels, through promotion of biofuel plantations, promoting relevant research and development, and streamlining regulatory certification of new technologies.

31. Regulations for the Environmental Management Act in Namibia entered into force in 2012 providing the legal framework for environmental impact assessments (EIAs), of which approximately 200 are now processed per year. Strategic environmental assessments (SEAs) were carried out for identified policies, plans and programmes including Namibia's biofuels development.

32. China's national biodiversity strategy includes the assessment of the impacts of biofuels on biodiversity. Some progress has been achieved. A study on impacts of biofuel plantations on biodiversity has been undertaken. However, a system has yet to be established to manage environmental safety of biofuel production.

33. Belgium's biodiversity strategy pays special attention to the need for the integration of the conservation and sustainable use of biological diversity into the different relevant sectors of society, including social and economic sectors, including for biofuels.

Reported problems with integration and mainstreaming biodiversity into energy and biofuels policies

34. Germany reports that although the generation and use of its renewable energy is not to take place at the expense of biological diversity, reconciling the two goals will be a major task for the years ahead. Undeveloped land is a finite resource. Apart from nature conservation, competitors for its use include agriculture and forestry, human settlement, transport, raw materials extraction and energy production. Undeveloped land is necessary to safeguard the services of the natural regime, as a production and recreation space for humans and to maintain biological diversity. The transformation of the energy supply system can potentially create new risks. Preventing adverse effects on species diversity as far as possible therefore remains a challenge for the future. At the same time systematic use should also be made of opportunities to promote biological diversity in measures to transform the energy supply system.

35. Montenegro reports that when it comes to specific sectors, an overview of the national biodiversity strategy and plan and other sources lead to a conclusion that least success with mainstreaming biodiversity was achieved in the energy sector and spatial planning. The energy strategy and spatial plans for development of large energy facilities have failed to provide for adequate assessment of important biodiversity in proposing specific energy development projects (although this in particular refers to planned utilization of hydropower). A similar observation is made by Hungary.

36. Croatia reports that plans and programmes of the energy sector, which have a huge impact on nature, did not go through an SEA procedure.

37. The Netherlands reports that progress with green growth is hampered due to the counterbalance between positive measures, such as the greening of the EU agriculture policies, and sustainability criteria on renewable energy, and negative factors, in particular the fact that harmful subsidies in the energy, transport and agricultural sectors are not reformed.

Reports of negative impacts of biofuels production on biodiversity

38. Ethiopia reports that the expansion of small-scale and commercial agriculture, including for biofuels, is a major driver of forest loss and degradation. Biofuel plantations are aggressively undertaken in some important woodland ecosystems. Consequently, many wild animals (including lions, cheetahs, giraffes and buffaloes) and unique plants are under threat.

39. Rwanda also reports that bioenergy is leading to significant changes in existing land-use systems.

40. Hungary reports that biomass is sometimes produced in an unsustainable way as an energy resource. The main goal of the National Energy Strategy 2030 is to terminate the country's energy dependency. The strategy defines five tools to achieve this goal, and two of them concern biodiversity indirectly: energy saving and the support of renewable energy production. But on the other hand, the fifth corner point of the strategy is the creation of agriculture that can flexibly shift between food and energy plants as needed by gradually putting fallow land under production. However, fallow lands play an important role in biodiversity conservation and their introduction into agriculture may not be advisable, although the strategy encompasses some rules to reduce biodiversity loss regarding the conditions when fallow lands should be used for energy plant production.

41. Honduras has indicated that a main threat to biodiversity is African palm monocultures (to generate energy from biomass).

42. In Madagascar, the biofuel sector is still at start-up stage. About 16 million ha are estimated fit for exploitation, and 20 investment projects (12 for agro-biofuel, 8 agro-ethanol) are provided for 1.4 million ha, but the actual implementation of these projects in 2011 covered only about 58,000 ha with a low success rate. These large-scale deployments of bioenergy crops obviously pose potential threats to Madagascar's already seriously threatened biodiversity. But on the other hand the country suffers greatly from forest loss and degradation from unsustainable fuelwood extraction. The promotion of the use of alternative materials to wood as energy sources includes the production of biofuels and energy from agricultural waste.

Research and development of tools to support the sustainable production and use of biofuels

43. The UK reports ongoing research that offers an opportunity to monitor the pressures which the country's consumption may cause in the countries of source, and can provide the evidence for the formulation of policies to avoid or mitigate potential impacts on the overseas ecosystems which provide the UK with essential biomass. The UK Biodiversity Framework includes a number of specific deliverables relating to the development of policy support tools and support for international initiatives such as ongoing research to incorporate biodiversity into the 2050 Pathways Calculator, a tool to determine the mix of low-carbon technologies that supply the country's energy up to 2050, so that UK greenhouse gas emissions are reduced by at least 80 per cent by 2050 relative to 1990 levels.

44. The Czech Republic is studying how environmentally harmful incentives or subsidies having a negative impact on biodiversity should be reformed by 2020. The purpose of the study is to provide guidance on how to identify and reform any subsidies harmful to biodiversity. The study identifies the main problems related to negative impacts on biodiversity in agriculture and forestry, energy production and fossil fuels, water, fishing and transportation. The study uses the methodology employed by the Ministry of the Environment, Food and Rural Affairs (DEFRA) of the UK and it is based on the "system of signal lights". This is the only reported example of tools and approaches being shared between Parties

(re. decision IX/2 paragraph 8 (a)). A list of possible adaptation measures to promote biodiversity protection and its adaptation to projected climate change has been set up in the Czech Republic. This includes limiting large-scale production of liquid biofuels (the first generation biofuels, also known as agrofuels).

45. The Netherlands reports research showing that an impact of further biofuels development is further land-use change resulting in more damage to forest ecosystems and more loss of biodiversity. The allocation of large stretches of land to biofuel investors also had negative social effects, and in several countries land allocated to investors for the production of, for example, *Jatropha* was located at least partially in national parks. Dutch and local non-governmental organizations (NGOs) and knowledge institutes were also supported by the Dutch Government to conduct research in the field of biofuels, to pilot new biofuel production options and related technology such as cooking devices based on biofuels, and to raise awareness around positive and negative effects of biofuels.

46. Canada reports on research showing how the cattail (*Typha* spp.), a common wetland plant, can be a valuable input into a modern bioeconomy. Harvesting and processing cattails produces low-cost bioenergy, fights eutrophication (nutrient loading) by capturing phosphorus, recycles this phosphorus into fertilizer, produces carbon credits and improves wetland habitat.

47. The Sudan reports research on the production of biofuel using several Sudanese yeast strains proved to produce ethanol from molasses, a sugarcane by-product, and sweet sorghum substrate.

48. Belgium reports a federal level study on biofuels which evaluates the biodiversity impact of the development of agrofuels, including genetically modified plants. This study comprises three main parts: the study of the environmental (biodiversity) impacts; the analysis of the socioeconomic impacts; and policy recommendations.

49. The scientific programme of Cameroon is divided into seven strategic areas, one of which is new and renewable energy (biofuels, animal energy).

Scope of the fifth national reports and gaps regarding assessing progress in implementation of decisions IX/2 and X/37

50. National reports remain a limited source of information due to overall inadequate reporting. Of the 92 fifth national reports available, almost half (44 reports) make no mention of biofuels or bioenergy. Of the remainder, most provide limited information to evaluate progress in the implementation of decisions IX/2 and X/37. Although some Parties may not have significant biofuels activities, most have at least some level of involvement. Some Parties that are known to have significant biofuels production, including some with well-publicized impacts on biodiversity, have not reported specifically on the topic in their fifth national report. Malaysia, for example, has undergone significant expansion of crops also used for biofuels, notably palm oil. Progress with sustainability of palm oil production, with regard to biodiversity, is not specifically mentioned in Malaysia's fifth national report, although it does contain substantial information on measures which could support progress towards sustainability (such as the expansion of protected areas, the National Action Plan for Peatlands, the National Agro Food Policy: Mainstreaming Biodiversity into the Agricultural Sector, spatial planning mainstreaming, and the upcoming National Sustainable Consumption and Production Blueprint).

51. The Executive Secretary has focused this analysis on the larger-scale application of biofuels, meaning in particular liquid biofuels (such as bioethanol and biodiesel) used primarily in the transportation sector. But the larger-scale use of biomass (such as forest products) used for other fuel types (such as thermal energy or biogas) is also reported. Finland, for example, reports extensively on large-scale bioenergy extraction from forests, much of it used in thermal energy generation, including significant work regarding ensuring sustainability where the impacts of the increased use of bioenergy on biodiversity and the nutrient and carbon cycles of forests have been assessed, and guidelines have been set to safeguard biodiversity. Logically, such scales of bioenergy production are equally relevant to decisions IX/2 and X/37. Italy also reports on fuelwood, including a case study of work on the

sustainability of the forest-wood-energy production chain in the territory of a proposed Biosphere Reserve.

52. Conversely, many developing country Parties report serious problems with over-exploitation, usually small-scale, of fuelwood, primarily for domestic purposes, leading to serious impacts on forests. While such bioenergy sources might be beyond the scope of “biofuels” (in the context of decisions IX/2 and X/37) they are not irrelevant. For example, most countries often also reference measures to promote sustainable renewable energy, including liquid biofuel and sources to mitigate the problem of fuelwood over-exploitation.

53. Most fifth national reports make reference to the importance of the promotion of renewable energy as a means to attain sustainability in the energy sector, but do not necessarily explicitly refer to bioenergy in this context. A number of Parties report measures to increase biofuels production as part of renewable energy strategies but do not provide information with regard to the positive or negative impacts on biodiversity.

54. No Party has reported measured positive impacts of the production and use of biofuels on biodiversity. Most positive benefits are usually implied, on the assumption that renewable energy reduces greenhouse gas emissions and, therefore, mitigates climate change, or reduces pressures on other bioenergy sources. But lack of measured benefits remains a significant gap in assessing progress with regard to decisions IX/2 and X/37. Likewise, no Party has reported progress with implementation of decisions IX/2 and X/37 with regard to positive or negative impacts on indigenous and local communities.

55. No report contains any significant information on the development of national inventories of areas of high biodiversity value, critical ecosystems, and areas important to indigenous and local communities that are explicitly linked with assessment and identification of areas or ecosystems that could be used in, or exempted from, the production of biofuels, although some Parties report on broader efforts in this regard.

56. Fifth national reports (so far) also contain very limited information on the use of relevant tools and guidance to promote the positive and minimize the negative impacts of biofuels production and use on biodiversity.

IV. CONCLUSIONS

57. The activities of processes and forums other than the Convention on Biological Diversity, including those reported above among others, remain key means to advance common approaches to address implementation of decisions IX/2 and X/37 at the international level. Although some obstacles remain, notably addressing indirect effects of biofuels, good progress is demonstrated in these forums and it is encouraging that decisions IX/2 and X/37, including discussions leading to them under the Convention, have had a demonstrable impact.

58. There is also evidence from national reports that decisions IX/2 and X/37 have prompted, directly or indirectly, shifts in approaches to biofuels at national level. These range from strict limits being imposed on biofuels to, more commonly, progress in integrating more realistic projections for biofuels and strengthened attention to sustainability within a broader portfolio of renewable energy approaches. This progress is, however, counterbalanced by a large proportion of Parties that might not be addressing the requirements in decisions IX/2 and X/37, based on fifth national reports. But, overall, national reports remain a limited source of information on which to quantify progress with regard to the implementation of decisions IX/2 and X/37.

59. Agriculture is already the dominant human use of land and water, and a significant consumer of other resources such as energy, fertilizers and agrochemicals. The fourth edition of the Global Biodiversity Outlook (GBO-4) confirms that the agriculture sector, including the broader context of food

systems, is the dominant factor determining projected loss of terrestrial and freshwater biodiversity to 2020 based on business as usual.²⁰ This means that progress in achieving sustainable management of production landscapes, and notably sustainable increases in agricultural production, and ways and means by which this is undertaken, is the primary factor determining whether the mission of the Strategic Plan for Biodiversity 2011–2020 will be achieved. Biofuels is a sub-topic of this broader topic. Strategies and approaches to achieve this sustainability, while simultaneously ensuring food and energy security, are already identified and in some areas are already being widely adopted. Most of the solutions at the production level in agriculture centre on the sustainable intensification of production through the rehabilitation of ecosystem services in agricultural landscapes, and these ecosystem services are underpinned by biodiversity.²¹

60. A number of assessments have confirmed that it is possible, globally, to achieve sustainable food, energy and water security to meet projected demands without significant expansion of land under cultivation and simultaneously reduce production inputs, and their external impacts, to sustainable levels. In some cases, land under cultivation can be reduced, allowing for restoration of natural landscapes. For example, a recent assessment of this topic for Brazil²² concludes that with appropriate strategies, mainly through improvements in productivity, current land use in Brazil is more than enough to meet projected demands for food and energy, including for projected exports. This is essentially the core approach of Brazil's biofuels strategy. Such scenarios may not automatically apply to all countries, or be easily achieved, particularly for those developing countries with higher population densities. But the evidence suggests that significant gains in productivity might be available across the board. The issues are the political will, determination, capacity and incentives to achieve sustainability goals.

61. While there is a need to improve approaches specifically aimed at biofuels, the need to consider biofuels in a broader context was noted in paragraph 8 of decision XI/27. Most organizations, and probably most Parties, consider biofuels in this context. Such an approach is, for example, the cornerstone of the new Strategic Framework 2010-19 of the Food and Agriculture Organization (FAO). Its five Strategic Objectives aim to help eliminate hunger, food insecurity and malnutrition; make agriculture, forestry and fisheries more productive and sustainable; reduce rural poverty; enable inclusive and efficient agricultural and food systems; and increase the resilience of livelihoods to disasters. The conservation and sustainable use of biodiversity components are common elements throughout this Strategic Framework and are key elements to address sustainability. Further details have been provided by FAO to the fifth meeting of the Ad Hoc Open-ended Working Group on Review of Implementation of the Convention in document UNEP/CBD/WGRI/5/INF/22. This includes details of specific activities and outputs that can be identified within the different programmes of work of the different parts of FAO, and initiatives, milestones and activities, that mainly contribute to Aichi Biodiversity Targets 5, 6, 7, 8, 9, 11, 13, 14, 15, and 16 as well as several of the others. The importance of successful implementation of the approach, as well as similar approaches being undertaken by other relevant organizations, and notably the adoption of similar approaches at national level, to the achievement of the objectives of the Strategic Plan for Biodiversity 2011–2020 is currently under-recognized.

²⁰ A more detailed assessment of the topic is provided by PBL Netherlands Environmental Assessment Agency (2014). *How sectors can contribute to sustainable use and conservation of biodiversity*. CBD Technical Series 79. Secretariat of the Convention on Biological Diversity. In press. <http://www.cbd.int/ts/default.shtml>.

²¹ For example FAO's *Save and Grow* approach <http://www.fao.org/docrep/014/i2215e/i2215e.pdf>.

²² Strassburg B.B.N., Latawiec A.E., Barioni L.G., Nobre C.A., da Silva V.P., Valentim J.F., Vianna M., and E.D. Assad. 2014. When enough should be enough: Improving the use of current agricultural lands could meet demands and spare natural habitats in Brazil. *Global Environment Change* 28: 84 – 97.