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### IMPLEMENTATION OF ARTICLE 10 OF THE CONVENTION (SUSTAINABLE USE OF BIODIVERSITY) AND APPLICATION OF THE ADDIS ABABA PRINCIPLES AND GUIDELINES

*Note by the Executive Secretary*

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## 1. INTRODUCTION

1. This note presents background information to document UNEP/CBD/SBSTTA/14/7 'Review of Implementation of Article 10 of the Convention (Sustainable Use of Biodiversity) and Application of the Addis Ababa Principles and Guidelines', with reference to item 3.1.6 of the provisional agenda\* of the fourteenth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice.

2. In annex II of decision VIII/10 (on the Operations of the Convention), based on the annex of decision VII/31 (on the Multi-year programme of work of the Conference of the Parties up to 2010), the Conference of the Parties decided to undertake the in-depth review of the work on sustainable use of biodiversity at its tenth meeting. Article 2 of the Convention defines sustainable use as *the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.*

3. The Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity (hereafter AAPG), consisting of fourteen interdependent practical principles of general relevance to sustainable use in all sectors, were adopted by the Conference of the Parties in decision VII/12. Sustainable use is included as an objective in all Programmes of Work of the Convention and in the 2010 Biodiversity Target, as goal 4 with three associated targets.

4. The results of the review process, including recommendations, are available as document UNEP/CBD/SBSTTA/14/7. This note provides further information, including references and further details on voluntary submissions by Parties and international organizations. This note is based on: (i) an examination of information available from the third and fourth national reports (based on reporting Parties as of 1 December 2009); (ii) analysis of the relevance of the AAPG to agricultural biodiversity; (iii) a review of voluntary submissions from international and national non-governmental organizations with respect to the application of the AAPG; (iv) consultation of scientific articles and reports on the state of the world's resources and their use; (v) consideration of the findings of recent or current reviews of a number of programmes of work of the convention; and (vi) the findings of the first Liaison Group on Bushmeat, which was convened 15 to 17 October in Buenos Aires, Argentina, in conjunction with the World Forestry Congress (cf. UNEP/CBD/LG-Bushmeat/1/2).

5. The document contains information on the main sectoral trends of biodiversity in section 2 (in agriculture, forestry, fisheries, hunting and trade of wildlife, and tourism); information on traditional knowledge and sustainable use in section 3; information on synergies with other multi-lateral environmental agreements (MEAs) in section 4; an overview of available indicators for sustainable use in section 5; a number of case studies in section 6; and information on the application of the Addis Ababa Principles and Guidelines in sections 7 and 8.

6. In their fourth national reports, several CBD Parties identified challenges and/or obstacles to implementing sustainable use of biodiversity. These obstacles are listed below:

i) Un-operational definition of sustainable use. Application of the AAPG to a level that would be usable for users of biodiversity, such as farmers and foresters, is a challenge. One obstacle is that the concept of sustainable use does not have clear, widely accepted operational definitions, criteria and indicators within relevant sectors.

iii) Lack of standards and indicators to implement policies, programs, and adaptive management. Sustainable use has been integrated in most national strategies and plans; however, clear indicators to measure progress are often lacking, which hampers adaptive management.

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\* UNEP/CBD/SBSTTA/14/1.

iii) Lack of permanent systems to monitor the use of biodiversity. Several Parties lack a permanent system to monitor the state of biodiversity and the use of biodiversity, and as a result, have difficulty assessing the degree to which the use of biodiversity is influencing the state of biodiversity. Limited knowledge on the current levels of harvesting of many resources, such as medicinal plants, hampers the establishment of sustainable levels of use and indicators to measure progress.

iv) Insufficient knowledge. In many cases, the scientific basis for sound decision making on the sustainable use of biodiversity resources is insufficient. While the precautionary approach and adaptive management can temporarily bridge gaps in knowledge, further research is needed to improve sustainable exploitation methods of natural resources, and to monitor impacts of natural resource use.

v) Lack of harmonization between management and conservation plans. Although targets have been set in the programmes of different sectors from the aspect of usage and production, they are usually not from the aspect of sustainable use. Available management plans for natural resources such as water bodies, forests, game, and wildlife may not include biodiversity conservation measures.

vi) Difficulty in finding alternative means of subsistence. Obstacles exist for populations which must find alternative means of subsistence.

vii) Lack of law enforcement. Although most Parties report having ratified CITES, lack of implementation of CITES was frequently cited as a major obstacle for sustainable use. Capacity and resources to enforce laws on illegal harvesting is a challenge.

viii) Inadequate economic incentive frameworks to encourage sustainable use. There is a need for better methods to value ecosystem services, and to design incentive measures that facilitate sustainable use, and to minimise perverse incentives which contribute to biodiversity loss.

ix) Lack of political commitment and vision. This is often due to poor understanding of the benefits, goods and services provided by biodiversity and its contribution to sustainable development. It can lead to a lack of leadership and low national priority for sustainable use.

x) Insufficient financial resources, human and technical resources, and capacity. Inadequate and poorly qualified staff; lack of incentives for dedicated staff; non-continuity of trained personnel and change of staff were cited as obstacles. Limited financial resources and inadequate means hinder the enforcement of legal protections (and CITES) and, for example, the creation of management plans for protected areas.

## II. **SECTORAL TRENDS IN THE STATE OF BIODIVERSITY AND APPLICATION OF SUSTAINABLE USE**

### *2.1. Agriculture*

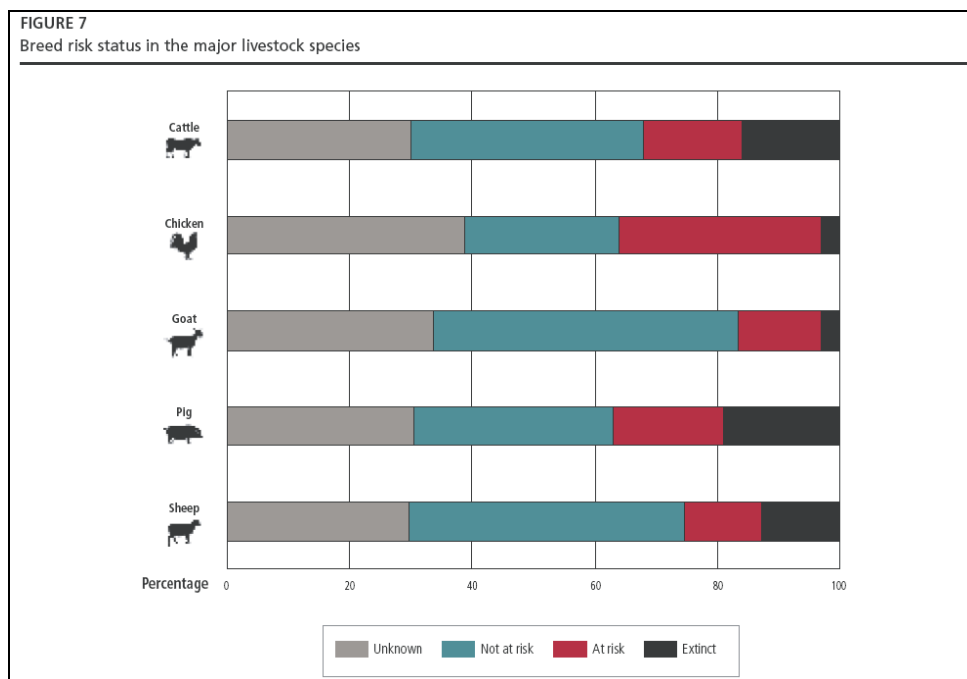
#### *2.1.1 Current trends in the sustainable use of agricultural biodiversity and sustainable agriculture*

7. Agricultural biodiversity (ABD) is a broad term that includes all components of biological diversity of relevance to food and agriculture and those that constitute the agro-ecosystem: the variety and variability of animals, plants and micro-organisms, at the genetic, species and ecosystem levels, which are necessary to sustain key functions of an agro-ecosystem, its structure and processes (decision V/5, appendix).<sup>51</sup> Over 70% of the world's poorest live in rural settings and depend directly on functioning agricultural ecosystems for their livelihoods.<sup>42</sup>

8. "Sustainable use" in agricultural systems can be perceived in two distinct ways: as the sustainable use of ABD and as sustainable agriculture (including its impacts within and beyond agricultural systems). Sustainable use of ABD implies the management, deployment or enhancement of genetic resources through use. Two basic categories of ABD can be distinguished: a.) harvested products from domesticated crops, crop wild relatives (CWR), domestic animals (including fish and other managed aquatic animals), and microbial and fungal genetic resources (particularly for post-harvest processes), and b.) non-harvested

components of ABD that contribute to agricultural productivity by provisioning, supporting and regulating ecosystem services, notably soil micro-biota, pollinators and the antagonists of pest and diseases. The conservation of the first category of ADB depends on their continued economic use, while the second category depends on sustainable agricultural practices.

9. The FAO State of the World’s Animal Genetic Resources<sup>23</sup>, released in June 2007, draws on the analysis of 169 country reports and concludes that there is urgent need for research, capacity-building and improved management guidelines to promote sustainable utilization and address worrying levels of genetic erosion<sup>i</sup>. The reported rate of breed extinctions is of great concern. FAO’s Global Databank for Animal Genetic Resources for Food and Agriculture contains information on a total of 7616 livestock breeds, of which approximately 20 percent are classified as at risk. Breed inventories, and particularly surveys of population size and structure at breed level, are inadequate in many parts of the world and unrecorded genetic resources are being lost before their characteristics can be studied. Among many of the most widely used high-output breeds of cattle, within-breed genetic diversity is being undermined by the use of few highly popular sires for breeding purposes. The report identifies the most significant threat to genetic diversity as the marginalization of traditional production systems and the associated local breeds, driven mainly by the rapid spread of intensive livestock production, often large-scale and utilizing a narrow range of breeds. Livestock-keeping is important to the livelihoods of an estimated 70 per cent of the rural poor<sup>40</sup>, who depend on the capacity of their animals to provide a variety of products and services including milk, meat, eggs, fibres, hides, power for cultivation and transport, and manure for fertilizer.<sup>25</sup>



10. The first State of the World’s Plant Genetic Resources<sup>19</sup> report was published in 1998 and the second report was released in 2009. While some indicators of genetic erosion have been developed, there have been few systematic studies of the genetic erosion of crop genetic diversity which have provided quantifiable estimates of the actual rates of genotypic or allelic extinction in Plant Genetic Resources for Agriculture. Nearly all countries, however, in their Country Reports to the FAO, reported that genetic erosion was taking place and that it was a serious concern. The main cause of genetic erosion in crops, as

<sup>i</sup> Genetic erosion refers to the loss of genetic diversity, including the loss of individual genes, and the loss of particular combinations of genes (i.e. of gene-complexes) such as those manifested in locally-adapted landraces.

reported by almost all countries, is the replacement of local varieties by improved, genetically modified or exotic varieties and species and invasive alien species.

11. The Global Strategy for Plant Conservation sets a target to conserve 70% of the genetic diversity of crops and other socioeconomically valuable plant species and to maintain the associated traditional and indigenous knowledge. It is estimated that for some 200 to 300 crops, 70% of genetic diversity is conserved *ex situ* in gene banks. However, this needs to be combined with management of diversity on farms in order ensure that their local varieties (including landraces) continue to adapt to climate change and other changes. Such *in situ* approaches are also needed, to reach all crops in production, as well as forage and tree species, and other species of social and economic importance, including medicinal plants, non-timber forest products, and the wild relatives of crops.<sup>53</sup>

12. Regarding the broader aspects of the impacts of agriculture on ecosystems, the intensification of agriculture and its expansion into natural ecosystems, notably tropical forests and wetlands, is arguably the most important direct driver of terrestrial biodiversity loss.<sup>4 38</sup> The in-depth review of the programme of work on inland waters (UNEP/CBD/SBSTTA/14/3 and UNEP CBD/SBSTTA/14/3/Add.1) highlights the continuing global impacts of agriculture on water availability and quality with significant impacts on biodiversity and ecosystem functioning. Underlying causes are population growth, changing consumption patterns (in particular rising meat consumption)<sup>38</sup> and perverse incentives and subsidies, including those for biofuels.

13. Between 1987 and 2007, the area of global agricultural land grew by approximately 3%.<sup>27</sup> With the world population projected to increase to approximately 9 billion by 2040<sup>59</sup>, the demand for agricultural products will only increase. Between 1961 and 1999, the amount of food grown per unit of area increased by 106%, however, this increase in land use efficiency was accompanied by a 203% increase in the use of phosphate fertilizer, a 648% increase in the use of nitrogen fertilizer, and a 854% increase in the production of pesticides.<sup>29</sup> It was also driven largely by rapid irrigation expansion.

14. The Millennium Ecosystem Assessment (MA) has assessed the state of cultivated systems (ecosystems for production of food, fiber, and fuel) and their impacts on ecosystem services. Cultivated systems have enhanced only four of the 24 ecosystem services examined in the MEA (crops, livestock, aquaculture, and carbon sequestration) and degraded 15 (including soil cycling, pollination, and the capacity of agro-ecosystems to provide pest control). Cultivation has affected the provision of other services by conversion of biologically diverse natural grasslands, wetlands, and native forests into less diverse agro-ecosystems, as the major global consumer of water, water pollution, and modification of nutrient cycling, notably nitrogen cycling.<sup>44</sup>

### *2.1.3 Approaches and conceptual frameworks to promote sustainable use of agricultural biodiversity*

15. The CBD addresses the conservation and sustainable use of agricultural biodiversity through the programme of work on agricultural biodiversity (decision V/5), which was reviewed by the Conference of the Parties at its ninth meeting (decision IX/1).

16. Several legal and action frameworks provide specific guidance on the priority actions and challenges regarding sustainable use of ABD. These include the Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture (GPA), the Global Plan of Action for Animal Genetic Resources (GPA-AnGR), the Global Strategy for the Management of Farm Animal Genetic Resources (GSMFAGR), and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). Diverse initiatives address the biodiversity issues of pollinators, soil fertility, and nutrition, such as the International Initiative for the Conservation and Sustainable Use of Pollinators, the International Initiative for the Conservation and Sustainable Use of Soil Biodiversity, and the International Initiative on Biodiversity for Food and Nutrition.

17. Organic agriculture<sup>ii</sup> has developed rapidly in the last few years with more than 31 million ha in at least 623,174 farms worldwide in 120 countries.<sup>61</sup> The sustainability of organic agriculture is often debated, with divergent views regarding its feasibility and productivity potential in resource-poor areas. Organic production requires a high level of managerial knowledge, the ability to protect crops from pests and diseases, and compliance with production process requirements. Certification is one of the most important cost items but also generates a premium. Reliable and independent accreditation and control systems are essential to enforce organic standards and regulations and to meet phytosanitary standards and general quality requirements.<sup>42</sup>

18. The International Assessment of Agricultural Knowledge, Science and Technology for Development (IAAKSTD)<sup>42</sup>, produced by 400 international experts, addresses issues such as the environmental consequences of productivity increases, the impacts of transgenic crops and the consequences of bioenergy development. The assessment recommends a range of options to achieve sustainability, including improving nutrient, energy, water and land use efficiency; improving the understanding of soil-plant-water dynamics; increasing farm diversification; supporting agro-ecological systems, and enhancing biodiversity conservation and use at both field and landscape scales. Policy options include ending subsidies that encourage unsustainable practices and using market and other mechanisms to regulate and generate rewards for agro-environmental services. Investment opportunities in agricultural knowledge, science and technology include resource conservation technologies, improved techniques for organic and low-input systems, breeding techniques for temperature and pest tolerance, research on the relationship of agricultural ecosystem services and human well-being, economic and non-economic valuations of ecosystem services, increasing water use efficiency and reducing water pollution, biocontrols of current and emerging pests and pathogens, biological substitutes for agrochemicals, and reducing the dependency of the agricultural sector on fossil fuels.

19. The draft information document on the applicability of the AAPG to the sustainable use of agricultural biodiversity as well as the draft information document on the specificities of agricultural biodiversity conclude that the AAPG generally apply to the sustainable use of agricultural biodiversity.<sup>52</sup> However, these are mostly stated in very general terms. In order for the AAPG to become useful guiding principles to improve sustainable use of ABD, which are readily understood by users of ABD and beyond, most would need to be explained, or operationalized, and better communicated in order to address specific concerns surrounding the conservation and use of ABD, particularly plant and animal genetic resources.

20. In their fourth national reports, most Parties reported at least one measure put in place to promote sustainable use in the agricultural sector. Measures targeted at the sustainable use of genetic resources in agricultural crops included: the elaboration of a protocol for *ex situ* conservation of genetic resources, seed collection and duplication, the establishment of national genetic resource centers, inventories of plant genetic resources for food and agriculture, collection of breed information for farm animal genetic resources, and participatory plant breeding. Measures aimed at sustainable agriculture included: promoting organic agriculture, facilitating a move from shifting cultivation to permanent agriculture, developing an index to measure the capacity of agricultural land to provide suitable habitat for terrestrial vertebrates, programmes to target agricultural pollution, strengthening of scientific and technical capacities through research, promoting efficient farming techniques, and formulating a working definition of sustainable agriculture. Other measures included establishing protected areas, training of farmers on sustainable practices, creating of environmental farm plans, and improving agro-forestry.

21. South Korea has established a data network for agricultural genetic resources as well as a national management system of forest seed varieties. Bhutan has developed a gene bank to store 408 plant

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<sup>ii</sup> Organic agriculture is defined by the FAO/WHO Codex Alimentarius Commission as "a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles and soil biological activity. It emphasizes the use of management practices in preference to the use of off-farm inputs (...) This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials, to fulfill any specific function within the system."

specimens, including more than 300 rice varieties. Conservation of indigenous livestock breeds is also under way. Lebanon is mainstreaming biodiversity management considerations into medicinal plants production processes by introducing a certification system for sustainable harvesting by small community based enterprises. Niue reports that it has placed the emphasis on organic farming practices for both vanilla and noni (*Morinda citrifolia*) farming and commenced exporting these products to international markets. The Republic of Moldova is implementing a project entitled “Pollution control in agriculture” that provides for actions on reduction of nutrients in the Danube Basin and Black Sea Basin by means of an integrated management of the land and aquatic resources.

22. Some Parties defined indicators to measure the sustainable use of agricultural biodiversity. These included the application rate of agrochemicals, the surface of agricultural land subject to environmentally-conscious practices or supporting biodiversity, the proportion of freshwater areas in good ecologically state, the trophic state index, certification criteria for sustainable biofuels, and nitrogen balance. However, few Parties reported measures to monitor these indicators.

## 2.2. Forestry

### 2.2.1. Current trends in the sustainable use of forest biodiversity

23. Forests cover just under 4 billion ha, or 30 percent of the earth's land area.<sup>21</sup> Tropical forests are amongst the world's richest ecosystems, being home to an average of 100 tree species per hectare and more than two thirds of all terrestrial species. Forest ecosystems, species, and genes in all forest biomes provide numerous essential services, such as water storage and purification, air filtration, food, fodder, medicines, shelter, recreation, carbon storage, and religious and spiritual value.<sup>44</sup> Non-timber forest products (NTFPs), such as medicinal plants, food plants, rattan, bushmeat and bamboo play an important role in the well-being of hundreds of millions of people worldwide.<sup>44</sup> The provision NTFPs is often dependent on intact forest ecosystems with high biodiversity (cf. e.g. CBD Technical Series 39 and 43).

24. Forest biodiversity is being lost at an alarming rate. Global assessments such as the Millennium Ecosystem Assessment and the Red List of Threatened Species™ indicate that a large and increasing number of forest ecosystems, populations and species are threatened or being lost due to the loss and degradation of forest habitats, and that this loss of forest biodiversity will be aggravated by the effects of climate change.<sup>37 45</sup> It is assumed that numerous, but not yet scientifically described, species are presently being lost together with their tropical forest habitats.<sup>44 13</sup> Globally, over half of the temperate broadleaf and mixed forest biome and nearly one quarter of the tropical rainforest biome have been fragmented or removed by humans.<sup>44</sup>

25. The 2007 FAO State of the World's Forest report states that deforestation occurs at a rate of about 13 million hectares per year.<sup>22</sup> Many of these drivers of deforestation lie outside of the control of the forest sector, and are caused by activities in other sectors, in particular agriculture, transport, energy, and mining.<sup>44 50</sup> An estimated 6 million hectares of forests that are lost each year are primary forests<sup>iii</sup>, which are exceptionally rich in biodiversity.<sup>22</sup> About 40 per cent of remaining primary forests are increasingly threatened by anthropogenic activities, such as logging and agricultural expansion.<sup>4</sup> While the majority of the loss of primary forests occurs in the tropics, the logging of remaining old-growth forests in temperate and boreal areas is also a matter of concern.<sup>44</sup> In recent years, forest planting, restoration, and natural expansion of forests have partly compensated for the overall loss of forest area, mainly in Europe and Asia. Between 1990 and 2000 the global net loss of forests was estimated to be 8.9 million hectares per year while between 2000 and 2005 the net loss of forest was calculated at 7.3 million hectares annually. While some countries have made notable progress in reducing their rate of deforestation, other countries and regions have seen an increase in deforestation rates.<sup>21 31 57 63</sup>

26. The consumption of main timber products (roundwood, sawnwood, pulp, paper) is expected to increase over the next 30 years. The use of solid biofuels for electricity production could be three times

<sup>iii</sup> Forests of native species, in which ecological processes are not significantly disturbed (FAO, Global Forest Resources Assessment, 2005).



larger by 2030 than current levels.<sup>22</sup> Global demand for industrial roundwood is expected to increase by 50 to 75 per cent by 2050.<sup>55</sup> In consequence of growing demand, tropical forest plantation area more than doubled between 1995 and 2005, to 67 million hectares, mostly in Asia. Plantations in boreal and temperate regions have also increased in area and this trend is expected to continue.<sup>35</sup> These developments raise major sustainability issues. The use of relatively few tree species in plantations and modified natural forests, for example, could have negative effects on a number of forest-dependent species and for ecosystem resilience (cf. CBD Technical Series nr. 43).<sup>16 30</sup>

27. Illegal logging and illegal harvesting of forest products seriously undermine national efforts to improve sustainable forest management in many countries. Governments, mostly in developing countries, lose an estimated USD 15 billion a year as a result of uncollected taxes and royalties due to illegal logging. Recent estimates suggest that up to 15 per cent of internationally traded roundwood might originate from illegal sources.<sup>3 8</sup> Rare tree species and those with high value for timber or non-timber forest products are often in danger of becoming locally, regionally or globally extinct.<sup>21 37</sup>

28. Information regarding the sustainable use of timber resources is incomplete at the global level, however there is regional information which allows for some interpretations to be drawn. The Millennium Ecosystem Assessment reports that 83 non-tropical countries have the equivalent of 89% of their forests under some form of management regime, while data for developing countries indicate that about 3% of forest area is managed under formal long-term plans.<sup>45</sup> Other estimates suggest that at least 6% of forests in developing countries are included under some form of nationally approved management plan spanning a period of at least 5 years.<sup>20</sup> Another estimate suggests that approximately 7% of production forests found in tropical countries are sustainably managed.<sup>35</sup> The 2007 State of the World's Forests noted that 100 countries were attempting to manage their forest resources more holistically through the use of national forest programmes. Therefore it appears that many countries are taking steps to promote the sustainable use of their forest resources.

#### 2.2.2. *Approaches and conceptual frameworks for sustainable forest management*

29. The CBD addresses the conservation and sustainable use of forest biodiversity through the expanded programme of work on forest biodiversity (decision VI/22). The Conference of the Parties, at its ninth meeting, reviewed the programme of work and adopted a new set of priorities for its implementation, including: unregulated and unsustainable use of forest products and resources (including unsustainable hunting and trade of bushmeat, and their impacts on non-target species), climate change, desertification and desert creep, illegal land conversion, habitat fragmentation, environmental degradation, forest fires, and invasive alien species (decision IX/5).

30. The General Assembly of the United Nations adopted, in December 2007, resolution 62/98 on Non-Legally binding instrument on all types of forests (forest instrument), which describes SFM as a “dynamic and evolving concept which aims to maintain and enhance the economic, social and environmental value of all types of forests, for the benefit of present and future generations.” The resolution further identifies the seven thematic elements of sustainable forest management as: (i) the extent of forest resources; (ii) forest biological diversity; (iii) forest health and vitality; (iv) the productive functions of forest resources; (v) the protective functions of forest resources; (vi) the socio-economic functions of forests; and (vii) the legal, policy and institutional framework.

31. Criteria and indicators of sustainable forest management include those of the Montreal Process<sup>iv</sup>, the Ministerial Conference for the Protection of Forests in Europe<sup>v</sup>, and within-country criteria and indicators, such as those that form the basis of the Canadian Standards Association certification standard for sustainable forest management.

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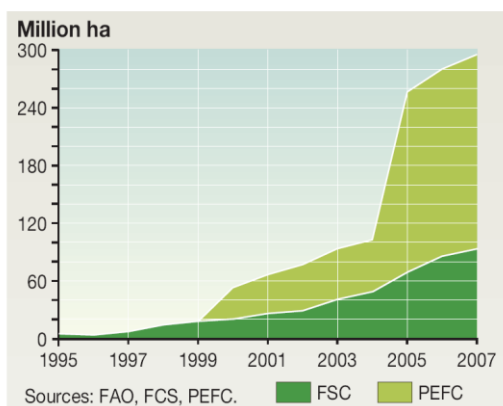
<sup>iv</sup> More information available at: <http://www.rinya.maff.go.jp/mpci/>

<sup>v</sup> More information available at: [http://www.mcpfe.org/filestore/mcpfe/publications/pdf/improved\\_indicators.pdf](http://www.mcpfe.org/filestore/mcpfe/publications/pdf/improved_indicators.pdf)

32. The International Tropical Timber Organization (ITTO) and the International Union for Conservation of Nature (IUCN) have developed and field-tested “Guidelines for the conservation and sustainable use of biodiversity in tropical timber production forests.”<sup>36</sup> The guidelines are designed to assist forest stakeholders in reducing their impacts on biodiversity in tropical production forests, and can, in many cases, be equally applied to other types of forest ecosystems.

33. Forest certification schemes when appropriately designed, agreed, and implemented, can be useful instruments in achieving biodiversity conservation. Several Parties refer, in their third and fourth national reports, to increases in the areas under various forest certification schemes, including their own national certification systems. For example, the Czech Republic created a Czech Forest Certification Scheme (CFCS) based on the Pan-European Forest Certification Scheme (PEFC) and Malaysia designed a Forest Management Certificate based on the 1994 Malaysian Criteria and Indicators (MC&I) for Sustainable Forest Management. Estonia reports that it has one of the biggest areas of FSC certified forests in Eastern Europe and South Africa reports that 80% of its forest plantations are managed according to FSC standards.

### ↓ Trends in forest certification



Source: UNEP/GRID-Arendal/UNEP/FAO/UNFF (2008)

34. Almost all Parties mentioned, in their fourth national reports, that they are implementing measures to promote sustainable use in the forestry sector, for example through the concept of Sustainable Forest Management (SFM). Reported measures included community-based forest management programs, policies and strategies for forestry management (i.e., national forest policies and forestry codes), forest management plans, monitoring timber harvesting, addressing illegal forest loggings, protected areas and forest reserve areas, harvest quotas, the use of various certification standards and the development of national certification standards for SFM, environmental impact assessments, public awareness building, gene reserve forest networks, the production or use of guidelines for forest plantations, and forest products research initiatives.

35. Some Parties defined indicators to measure the sustainable use of forests. These included the percentage of forest cover, the area of forests managed sustainably in proportion to total forested area, the number of community-managed forests, the area of forests under certification, the presence of a national forestry plan, and the number of forest management plans. Progress related to these indicators is reported to FAO through the Forest Resources Assessment 2010.

## 2.3. Fisheries

### 2.3.1. Current trends in sustainable use of marine, coastal and inland water biodiversity

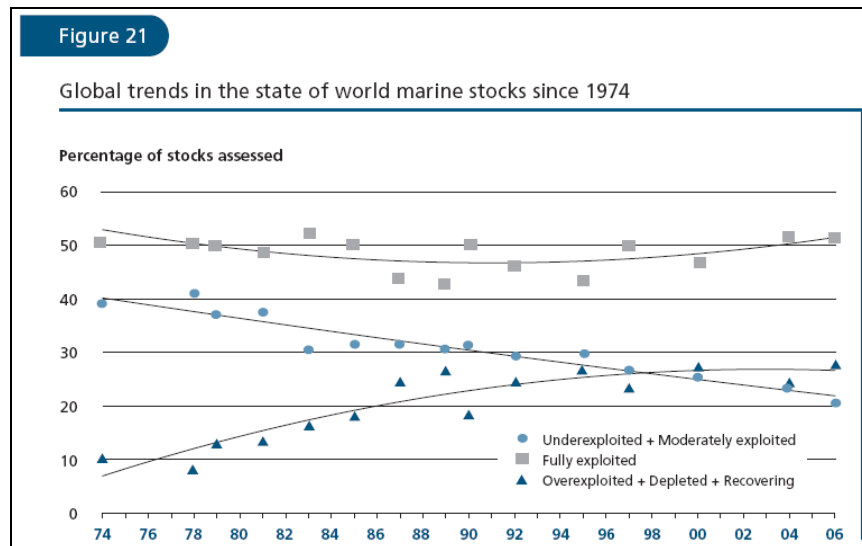
36. Fisheries play an important role in the global provision of food, directly accounting for at least 15% of the animal protein consumed by humans and indirectly supporting food production as aquaculture

and livestock feed. Demand for fish is expected to grow given escalating animal protein demands in developing countries and increasing human population.<sup>24</sup>

37. For marine ecosystems, the most important direct driver of change and biodiversity loss in the past 50 years, in the aggregate, has been fishing.<sup>48</sup> According to the 2008 FAO State of World Fisheries and Aquaculture report, an overall review of the state of marine fishery resources confirms that the proportions of overexploited, depleted and recovering stocks have remained relatively stable in the last 10–15 years, after the noticeable increasing trends observed in the 1970s and 1980s with the expansion of fishing efforts. In 2007, about 19 percent of stocks were overexploited, 8 percent depleted and 1 percent recovering from depletion. A further 52 percent of stocks were fully exploited, producing catches that were at/or close to their maximum sustainable limits with no room for further expansion. Only about 20 percent of stocks were moderately exploited or underexploited. Most of the stocks of the top ten exploited species worldwide, which together account for about 30 percent of the world marine capture fisheries production in terms of quantity, are fully exploited or overexploited.<sup>24</sup> More than three quarters (79%) of the known fish spawning aggregations around the world show declining fisheries catches and only a few of the known fish aggregations are protected.<sup>56</sup>

38. A recent global survey<sup>46</sup> suggests that the management of fisheries worldwide is lagging far behind international guidelines recommended to minimize the effects of overexploitation. Few countries had a robust scientific basis for management recommendations and transparent and participatory processes to convert those recommendations into policy while also ensuring compliance with regulations. The study suggests that the conversion of scientific advice into policy, through a participatory and transparent process, is at the core of achieving fisheries sustainability, regardless of other attributes of the fisheries<sup>vi</sup>.

39. Bottom fishing activities have damaged many cold water coral reefs, but the extent of this damage has not been quantified. Cold water corals provide habitat for many fishes and invertebrates and enhance biological diversity of deepwater ecosystems.<sup>32</sup> The fisheries on many known seamounts are overexploited, with the benthic communities seriously damaged by the impacts of heavy bottom trawling and other fishing gear. Seamounts support populations of deep-sea fish, which are particularly vulnerable to exploitation due to the fact that they are long-lived, slow to mature, and produce only few offspring. Knowledge of seamounts and their fauna is still very limited.



Source: FAO (2008)

<sup>vi</sup> The data for each country can be viewed at [http://as01.ucis.dal.ca/ramweb/surveys/fishery\\_assessment](http://as01.ucis.dal.ca/ramweb/surveys/fishery_assessment)

40. Accounting for more than 10 million tonnes, inland fisheries contributed 11 percent of global capture fisheries production in 2006.<sup>24</sup> However, many public administrations do not make assessments of the status of inland fisheries and much of the inland catch is underreported; providing accurate statements on the status of inland fisheries on a global or regional level remains a challenge. Additionally, the harvest of invasive alien species (IAS), such as tilapia, carp, or Nile perch, in some instances masks the decline native fish stocks, as overall fish production rises through substitution of wild or native species.<sup>39</sup> Scientific assessment of trends in the sustainability of inland fisheries is constrained by poor data availability and inland catches which are widely regarded as underestimated and in particular do not reflect the real nature of small-scale fisheries which can be critical for local food security.

41. Available data suggests that global landings from inland fisheries have grown continuously, and there are few examples of collapsing fisheries, with some fish stocks, especially in Latin America, remaining lightly exploited. Thus according to FAO, adopting a precautionary approach, inland fisheries could be developed further.<sup>24</sup> But such generalizations mask regional and local variations where declines are being widely reported. The impacts of fishing on many inland water species are clearly evident, but the impacts on total production are often unknown; most inland fisheries are multi-species based, most of which are not recorded. Most experts also concede that it is difficult, if not impossible, to disaggregate the impacts of fishing on resources *versus* the impacts of environmental degradation (which is a far bigger problem in inland waters than in oceans). Consequently, trends in sustainable inland fisheries have not been properly assessed despite the importance of this sub-sector.

42. According to the 2008 FAO State of World Fisheries and Aquaculture, world aquaculture, the cultivation of aquatic fauna and flora in natural or controlled marine or freshwater environments, has grown dramatically in the last 50 years. Production is reported to have risen from a production of less than 1 million tonnes in the early 1950s to a production of 51.7 million tonnes in 2006, with a value of USD 78.8 billion in 2006.<sup>24</sup> Most aquaculture production of fish, crustaceans and molluscs continues to come from inland waters (61 percent by quantity and 53 percent by value). Mariculture, aquaculture in the marine environment, contributes 34 percent of production and 36 percent of total value.<sup>24</sup>

43. Environmental impacts associated with aquaculture include: competition for space in bays and estuaries important for many marine species and ecosystems, such as mangroves; pollution, as cage fish farms and land-based fish farms can discharge effluent and wastewater that contain nutrients, chemicals, or pharmaceuticals; escaped farmed fish, which can become invasive and cause the disturbance of ecosystems, interbreeding with natural populations, and spreading of diseases; and contribution to overfishing of wild fisheries, as many farmed species are fed with wild fish feed. In some cases, the impacts on the ecosystems have been severe, e.g. the expansion of shrimp farming in South East Asia has led to the destruction of mangroves and wetlands that are of vital importance for flood control and as habitats of marine wild life, including marine populations important for fisheries.<sup>24</sup>

### 2.3.2. *Approaches and conceptual frameworks to promote sustainable use of aquatic ecosystems*

44. The CBD addresses the conservation and sustainable use of marine and coastal ecosystems through, inter alia, the programme of work on marine and coastal biodiversity (decision VII/5). The sustainable use of inland waters is addressed, inter alia, through the programme of work on inland waters (decision VII/4). Both programmes of work will be subject to in-depth review at the tenth meeting of the Conference of the Parties.

45. The 1995 FAO Code of Conduct for Responsible Fisheries, adopted by more than 170 members of the FAO, is voluntary and aimed at everyone working in, and involved with, fisheries and aquaculture in both inland or ocean waters. The Code consists of a collection of principles, goals and elements for action and was elaborated by representatives from members of FAO, inter-governmental organizations, the fishing industry and non-governmental organizations.<sup>18</sup> The FAO has also examined the application of the Ecosystem Approach to Fisheries as a sectoral approach to responsible management.<sup>28</sup>

46. The Marine Stewardship Council, created in 1999, has developed standards for sustainable fishing and seafood traceability. Both standards are based on independent third-party assessments by accredited certifiers.

47. In coastal areas, the ecosystem approach has been more commonly implemented through initiatives on Integrated Marine and Coastal Area Management (IMCAM), a participatory process for decision-making to prevent, control, or mitigate adverse impacts from human activities in the marine and coastal environment, and to contribute to the restoration of degraded coastal areas.

48. Many aquaculture industry associations have codes of practice for their particular operations that cover the release of mariculture species into the wild.<sup>1</sup> The FAO, NACA, UNEP, WB and WWF conjointly developed in 2006 the International Principles for Responsible Shrimp Farming.<sup>26</sup> The Norwegian directorate of Fisheries has implemented “Vision No Escapees”, a 30-point action plan from the Directorate of Fisheries to dramatically cut the number of escapees.<sup>12</sup>

49. The sustainable use of inland water ecosystems is addressed, *inter alia*, through the programme of work on inland waters (decision VII/4). This programme of work is undergoing an in-depth review and details are presented in documents UNEP/CBD/SBSTTA/14/3 and UNEP/CBD/SBSTTA/14/3/Add.1 (together with detailed background information in document UNEP/CBD/SBSTTA/14/INF/1). Sustainable use is a complex topic for this work programme. The direct use of biodiversity is covered partly under inland fisheries, above. But the more complex issue is the sustainable use of ecosystems and the services they provide. The review notes that on most fronts the trends in ecosystem service delivery are in general in serious decline driven largely by factors associated with land and water use practices. Further discussion, including proposed remedies, is provided in the aforementioned documents.

50. In their fourth national reports, most Parties, although less than for the forestry sector, mentioned measures pertaining to sustainable use in the fisheries sector. National initiatives include Australia’s Guidelines for the Ecologically Sustainable Management of Fisheries, and the Swedish Board of Fisheries assignment to operationalize the concept of sustainable use so that it can be used in the fisheries sector. Other measures implemented by Parties included regulations and quotas for specific species, marine protected areas, guidelines for the ecologically sustainable management of fisheries, ban of fishing in breeding zones and at certain times, ban of the use of toxic products and engines, national codes of conduct for responsible fishing operations, fishing licensing systems, various oceanographic and aquaculture research programmes, provisions for types of fishing gear to use and limits on the number of boats, reinforcement of fishing surveillance, management plans for fisheries, and participatory fishing programs.

51. Some Parties defined indicators to measure the sustainable use of aquatic biodiversity. These indicators included the trend in the number of fishery offense cases, the level of use of illegal marine practices, the number of coastal and marine protected areas, fish refuges, and no-take zones, the status of commercial fish stocks, effluent water quality for fish farms, and the number of overexploited fish species.

52. In their national reports and in the voluntary reports on Implementation of the Programme of Work on Marine and Coastal Biodiversity (14 reports submitted), some Parties reported on the development and adoption of overarching policies for marine aquaculture. These include the Strategy for Sustainable Development of European Aquaculture, which promotes an integrated approach regarding farming technologies, socio-economics, natural resources use and governance, and Canada’s Aquaculture Policy Framework, which includes a set of principles to ensure that actions support the social, economic, and environmental aspects of sustainable aquaculture development.

## **2.4. Hunting and Trade of Wildlife**

### **2.4.1. Current trends in the sustainable use of wildlife**

53. The UK Department for International Development estimates that of the 1.2 billion people in absolute poverty (with an income of less than USD1/day), up to 150 million (13%) rely on wildlife as a

key element of their livelihood asset base.<sup>9</sup> This is partly to do with their proximity to wildlife resources but also related to their limited access to substitutes or alternatives.<sup>44</sup>

54. Hunting for food in tropical forests is an issue of concern as there is strong evidence illustrating that the scale of hunting occurring in these regions poses a real threat to many tropical forest species and as the depletion of wildlife is intimately linked to the food security and livelihood of numerous tropical forest-region inhabitants. For instance, hunting provides between 30 to 80% of the overall protein intake of rural households in Central Africa.<sup>10</sup>

55. An information document on the conservation and sustainable use of wildlife-based resources: the bushmeat crisis (UNEP/CBD/SBSTTA/13/INF/9), reissued as CBD Technical Series 33, reviews the literature addressing the sustainability of hunting in tropical forests. The report suggests that over half of the species examined were hunted unsustainably, leading to growing concerns about ecosystem stability, food security, and the livelihoods of indigenous peoples and local communities.<sup>47</sup>

56. The Red List Index<sup>vii</sup> for birds indicates that birds used for food and medicines (just over 1,400 species out of a total of nearly 10,000) are more threatened than those that are not, and that the conservation status of these species is also deteriorating at a slightly higher rate.

57. The use of wildlife for trade is also a major economic activity: TRAFFIC has estimated the value of legal, international wildlife trade alone to be worth nearly USD300 billion in 2005, based on declared import values. This excludes the considerable amount of domestic trade that takes place. Wildlife trade comprises any sale or exchange by people of wild animal and plant resources, including medicines, food, ornaments and furnishings, clothing, pets/hobbies, ornamental plants, manufacturing and construction. While some communities and countries have been extremely successful in managing and regulating the use of their wildlife resources, a huge proportion of wildlife trade is manifestly unsustainable and often illegal.<sup>49</sup>

#### *2.4.2. Approaches and conceptual frameworks to promote sustainable use of wildlife*

58. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), which regulates international trade in endangered species, lists approximately 5,000 fauna species and 28,000 flora species in its three Appendices. In several cases, pressures related to overuse by hunting have led to the inclusion of animals species on the Appendices. In cases where there is significant concern regarding CITES implementation, the Standing Committee can recommend that Parties suspend imports from and/or exports of CITES-listed species to a given Party. Although CITES decisions are made on the basis of conservation concerns, increasing attention has been paid recently to the impacts some CITES decisions may have on local people's livelihoods and a commitment has been made to identify whether these conservation-motivated decisions will have unintended negative implications for poor people.<sup>49</sup>

59. The CBD Liaison Group on Bushmeat, which met in October 2009, issued recommendations, based on Technical Series 33, for addressing the bushmeat crisis (see UNEP/CBD/LG-Bushmeat/1/2).

60. The UNCTAD BioTrade Initiative assists developing countries in the formulation and implementation of National BioTrade Programmes. It focuses on countries which are rich in biodiversity and whose governments have a clear interest in developing a national capacity to promote biotrade. Since 2003 the BioTrade Initiative has also hosted the BioTrade Facilitation Programme (BTFP) which focuses on enhancing sustainable bio-resources management, product development, value adding processing and marketing. The BioTrade Initiative is also aiming to develop ecolabelling for wildlife products in the form of a BioTrade standard. This programme is aimed at promoting trade in wildlife products that will help to alleviate poverty, contribute to sustainable development and help countries fulfill their obligations under the CBD.

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<sup>vii</sup> The Red List Index (RLI) monitors the trends in the status of species

61. Other relevant guidelines and frameworks include a joint FAO-CIC publication entitled *Guidelines for Developing Sustainable Wildlife Management Laws*, which translates the AAPG into the context of hunting laws. The European Charter on Hunting and Biodiversity drew on the AAPG and the Ecosystem Approach to derive 12 fundamental charter principles that give guidelines for regulators and practitioners intended to ensure that hunting and hunting tourism in Europe are practiced in a sustainable manner. It was agreed upon by Parties to the Bern Convention in November 2007 and has received the endorsement of governments, environmental organizations and hunting associations in Europe.

62. TRAFFIC International and WWF International produced a report which addresses how societies can minimize the risks posed by wildlife trade.<sup>49</sup> Suggestions include:

a) the establishment of appropriate ownership and tenure regimes for wildlife, without which local people have little incentive to invest in the long term sustainability of the wildlife resource.

b) the use of captive, or semi-intensive, production to reduce the pressure on wild resources, while maintaining a regular source of supply for the trade.

c) the use of certification processes to identify wildlife goods that are derived sustainably and to promote sustainable management while generating better returns for poor producers.

d) shortening of the length and complexity of international wildlife trade chains, which limit the livelihood benefits from the trade received by primary producers. However, intermediaries in wildlife trade chain may perform many vital functions that would expose those with little resilience to a volatile industry.<sup>15</sup>

63. In their fourth national reports, most Parties mentioned measures pertaining to sustainable use of wildlife. Almost all Parties mentioned the implementation of CITES. Other measures included bans on use or harvesting of some species, in particular wild and endangered species, hunting regulations, licensing or permit systems for trade in species of wild flora or fauna, Wildlife Trade Management Plans, wildlife quotas, regulations on harvest timing or the size of specimens, environmental impact assessments, awareness-raising for managers, producers, traders and consumers of wildlife plants and animals protection, training of enforcement and customs officers, FLEGT action plan, monitoring surveys of species to gauge recovery rate, and strengthening the enforcement of CITES.

64. Indicators used to measure the sustainable use of wildlife, as reported by Parties, included the number of species and quantity of imported/exported plants, the number of permits/certificates and elaborated environmental agreements, and the number of surveillance, control, and legislative measures.

## **2.5. Tourism**

### *2.5.1. Current trends in the sustainable use of biodiversity through tourism*

65. The majority of global travel and tourism impacts biodiversity indirectly. A mapping study done in 2002 shows that, at a global level, the majority of biodiversity hotspots are concentrated in the South, while international tourist arrivals are still concentrated in the North.<sup>5</sup> However, developing countries are receiving an increasing share of the international tourism market<sup>60</sup>, with Asia showing the steepest growth rate, and forecasts suggest that developing countries will account for 30% of international tourism arrivals by 2020. Although overall Southern countries receive fewer tourists than Northern countries, parts of the South receive large numbers of international arrivals, and many of these coincide with biodiversity hotspots.<sup>5</sup> Many of the megadiverse developing countries are also mainstream tourism destinations with over 5 million international arrivals per year (e.g. South Africa, Peru, Mexico, and Brazil). Furthermore, tourism is one of the largest earners of foreign exchange for small island Developing States (SIDS) and least developed countries (LDCs). Tourism is now a huge contributor to the economies of many island nations, particularly in the Caribbean, the Mediterranean, East Africa and the Pacific. In 2008, travel and tourism contributed 14.8% of the Caribbean's Gross Domestic Product and 2.15 million jobs, representing 12.9% of total employment. These figures have been predicted to rise over the subsequent ten years.<sup>62</sup>

66. Many tourism attractions are closely linked to biodiversity, such as protected areas, natural beaches and islands, and traditional ways of life. In fact, biodiversity may well be one of the competitive advantages some developing countries have with regards to tourism.<sup>54</sup> It can generate jobs and business opportunities for host populations, and can help reduce or eliminate poverty. Tourism has traditionally been a source of financing for protected areas, and this contribution is growing.<sup>14</sup> For instance, South Africa's SANParks finances up to 75% of its entire operations through tourism revenues (operation and concession of hotels, camps, trails/tours, souvenirs, restaurants, etc).<sup>67</sup> A study in Western Australia shows that park tourism provided 207 million AUD to the Southern Forest and Gascoyne Coast Region in 2006, of which almost 90% was associated with national parks.<sup>65</sup> The economic value of Kakadu National Park, in Australia's Northern Territory, based solely on the parks' worth as a tourism asset, was estimated in 2004 as AUD 58.1 million, of which 88% are directly attributable to the park. Tourism is New Zealand's largest foreign exchange generator, and contributes 17.2 billion NZ dollars to its economy (or almost 10% of its GDP). At least 65% of tourists in New Zealand visit at least one park, over 10% say that their stay would be shorter if no park was visited, and another 12% say they come exclusively to visit parks.<sup>66</sup> However, most national park agencies are still not prepared, institutionally and technically, to manage partnerships with the private sector through, for instance, tourism concessions and licenses. A joint venture between the CBD Programme of Work on Protected Areas and the Tourism Task Force of IUCN's World Commission on Protected Areas aims to build park agency capacity to partner with the industry on tourism concessions.

*2.5.2. Approaches and conceptual frameworks to promote sustainable use of biodiversity through tourism*

67. There exists several governance systems for tourism in (or near) sensitive or protected areas. These include the CBD Guidelines on Biodiversity and Tourism Development and the corresponding user's manual entitled "Managing Tourism and Biodiversity", the United Nations Environment Programme/World Tourism Organization/IUCN Sustainable Tourism in Protected Areas Guidelines for Planning and Management, UNESCO's World Heritage sites and Biosphere Reserves, the European Charter for Tourism in Protected Areas (managed by EUROPARC Federation), and various global certification systems (including Green Globe, Costa Rica's Certification de Sostenibilidad Turística, and South Africa's Fair Trade in Tourism label). The Tourism Sustainability Council (TSC), a global membership council resulting from a merge between the Partnership for Global Sustainable Tourism Criteria (GSTC) and the Sustainable Tourism Stewardship Council (STSC) in 2009, offers a common understanding of sustainable tourism and the adoption of universal sustainable tourism principles and criteria. Many destinations have set up Local Agenda 21 processes to ensure that tourism is integrated into sustainable development plans, and the CBD's ecosystem-based approach has been applied in many sustainable tourism destinations, to ensure that the needs of all players are considered.

68. The effort towards sustainability in tourism, and the occasional practice of "greenwashing", has resulted in a proliferation of ecolabels, buzzwords and even certification schemes, often confusing consumers who are willing to "make a difference" through their travel choices: over 300 labels and certification systems exist in this area. The Secretariat is involved in a recent and significant effort to establish globally acceptable and objectively verifiable standards to define sustainability in tourism (see [www.sustainabletourismcriteria.org/](http://www.sustainabletourismcriteria.org/)). The Tourism Sustainability Council (TSC) would be involved in supporting their implementation, allowing for more objective management of biodiversity in tourism.

69. In recent years, technological solutions to most of the environmental challenges in tourism have been applied and tested. Sustainable energy, water and waste management in the tourism industry have been the subject of several publications by UNEP's Division of Technology, Industry and Economics. Conservation International's Center for Environmental Leadership in Business has published several reference papers on marine recreation, cruise ships and the siting, design and construction of resort facilities. Meanwhile, IUCN has published a manual on biodiversity-friendly hotels, and the International Business Leadership Forum's Tourism Partnership has produced a handbook on environmental management for hotels. The Tour Operators' Initiative is network of tour



operators committed to sustainable development and provides a forum to develop and test sustainable management tools, such as guidelines for the accommodation, marine recreation and supply chain management strategies.

70. Approximately half the Parties mentioned measures pertaining to sustainable use in the tourism sector in their fourth national reports. Measures mentioned by Parties consisted of including environmentally sustainable tourism as an objective of their NBSAP, the development of pilot projects to promote sustainable ecotourism, the formulation and implementation of an ecotourism strategy for protected areas, the mention of biodiversity concerns in tourism development plans, the creation of guidelines and toolkits for sustainable tourism, the development and application of environmental standards for tourism, the creation of a catalogue of exemplary practices in ecotourism, the organization of a “Year of Green Tourism” (Hungary, 2007), implementation of measures to promote green tourism, such as ecotourism awards, model projects, and information dissemination, capacity-building for monitoring and responding to environmental problems in national tourism sites and enforcing inspection, and monitoring of natural resource exploitation and environmental protection for sustainable tourism development.

71. Few Parties defined indicators to measure sustainable use in the tourism sector. Those mentioned consisted of the resources generated from sustainable tourism and the number of sustainable ecotourism projects.

### III. TRADITIONAL KNOWLEDGE AND SUSTAINABLE USE

72. In decision IX/13 A, paragraph 4 on Article 8(j) and related provisions, the Conference of the Parties requested that the Executive Secretary continue to compile case-studies, to analyse and report on work concerning Article 10(c), and to provide advice to the Working Group on Article 8(j) and Related Provisions at its sixth meeting on how this related provision may be further advanced and implemented as a priority. This advice is synthesized in a note by the Executive Secretary (UNEP/CBD/WG8j/6/2/Add.1) prepared for the sixth meeting of the Working Group, held in Montreal in November 2009. The note makes, among others, the following points relevant for further efforts to protect and encourage customary use:

(a) Customary-use practices are closely connected with traditional knowledge, as these practices are learned, maintained and applied in hands-on settings and transmitted orally. Practices relating to use of biological resources are often guided by customary regulations, moral codes, ethical norms, and specific sanctions that help to promote sustainability;

(b) Providing access to lands and resources and involving indigenous and local communities in decision-making and management of those resources are the two most important equity issues that Parties to the Convention face in relation to Article 10(c);

(c) Customary use depends on striking a balance between two interdependent aspects: access to customary lands and resources, and management of such resources in a way that fully includes indigenous and local communities and other stakeholders. Management options that devolve authority to indigenous and local communities have the greatest potential for long-term sustainable customary use.

(d) Access to lands and biological resources could be provided according to a spectrum of possible mechanisms, including land tenure, recognition of indigenous and/or community conserved areas, special access, and general access. It is relevant to stress that the recognition and respect of traditional land tenure is arguably the most effective method, as it ensures secure and long-term access to lands and biological resources and allows resource allocation and use to be based on traditional knowledge and practices;

(e) There is a need to balance conservation needs, the protection of species, and the rights of indigenous and local communities to benefit from the use of species. Indigenous and local communities must be involved and effectively participate at all levels of resource management, and national Governments must be responsive to the input of local communities;

(f) Customary management by indigenous and local communities of traditional territories is highly complementary to the ecosystem approach (especially principles 1 and 2) and the Addis Ababa Principles and Guidelines (especially principle 2). Recognizing customary-use rights can benefit conservation efforts, while denying customary-use rights can threaten biological diversity.

#### IV. SYNERGIES WITH OTHER MULTILATERAL ENVIRONMENTAL AGREEMENTS (MEAS) ON SUSTAINABLE USE

73. Sustainable use is encompassed in various ways under the different objectives, areas of work and terminology of Multilateral Environmental Agreements (MEAs). The views of the CBD, the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the Convention on the Conservation of Migratory Species of Wild Animals (CMS), the Convention Concerning the Protection of the World Cultural and Natural Heritage (WHC), the United Nations Framework Convention on Climate Change (UNFCCC), and the United Nations Convention to Combat Desertification (UNCCD) with respect to sustainable use are discussed below.

74. The sustainable use of biological diversity is a central concept in the CBD. For Ramsar and CITES, the sustainable use of wetlands and internationally-traded wildlife, respectively, is a key concern. CMS, WHC, UNFCCC, and UNCCD all include, to a greater or lesser extent, provisions relating to sustainable use.<sup>58</sup>

75. The Parties to Ramsar are committed to ‘wise use’. Under Article 3.1 of the convention, they are required to ‘formulate and implement their planning so as to promote the conservation of wetlands included in the List and as far as possible the wise use of wetlands in their territory’. The Parties have devoted considerable effort to the elaboration of the notion of wise use and to the development of guidelines for the wise use of wetlands. The following definition of ‘wise use’ was adopted by the Parties to Ramsar in 2005: Wise use of wetlands is the maintenance of their ecological character, achieved through the implementation of ecosystem approaches<sup>viii</sup>, within the context of sustainable development (Ramsar Resolution IX.1 Annex A, 22).<sup>58</sup>

76. There is no explicit mention of sustainable use in the text of the CITES. However, a very similar concept lies at the heart of CITES. Specifically, trade in specimens of species listed in Appendix I or Appendix II of CITES requires, *inter alia*, a finding that the export ‘will not be detrimental to the survival of that species’ (Article III.2 (a)). In addition, the export of Appendix II species requires that the species be maintained ‘throughout its range at a level consistent with its role in the ecosystems in which it occurs’ (Article IV.3). In 2004, the Conference of the Parties to CITES urged the Parties to make use of the AAPG in making non-detriment findings. Moreover, in recent years the Parties to CITES have increasingly adopted the language of sustainable use. For example, the CITES vision statement, contained in the CITES Strategic Vision: 2008-2013, is as follows: Conserve biodiversity and contribute to its sustainable use by ensuring that no species of wild fauna or flora becomes or remains subject to unsustainable exploitation through international trade, thereby contributing to the significant reduction of the rate of biodiversity loss.<sup>58</sup>

77. The Convention on Migratory Species (CMS) itself does not mention sustainable use, but the preamble does include the clause: “AWARE that each generation of man holds the resources of the earth for future generations and has an obligation to ensure that this legacy is conserved and, where utilized, is used wisely”. CMS Appendix II includes migratory species ‘which have an unfavourable conservation status and which require international agreements for their conservation and management, as well as those

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<sup>viii</sup> Including *inter alia* the Convention on Biological Diversity’s “Ecosystem Approach” (CBD COP5 Decision V/6) and that applied by HELCOM and OSPAR (Declaration of the First Joint Ministerial Meeting of the Helsinki and OSPAR Commissions, Bremen 25-26 June 2003).

which have a conservation status which would significantly benefit from the international cooperation that could be achieved by an international agreement' (CMS Article IV.1). The treaty provides guidelines for these agreements and states that where appropriate and feasible, such agreement should provide for, *inter alia*, 'measures based on sound ecological principles to control and manage the taking of the migratory species' (CMS Article V.5 (j)). In practice, this clause has been interpreted as one that requires that such 'taking' is sustainable, and the agreements that have emerged from the CMS have addressed this issue. References to sustainable use appear in a number of the resolutions and recommendations agreed by the Parties.<sup>58</sup>

78. The World Heritage Convention (WHC) is concerned with the protection of cultural and natural heritage. While the text of the convention does not explicitly mention the concept of sustainable use, some of the recommendations subsequently agreed by Parties for specific sites do include measures for ensuring that any use of biodiversity is sustainable. The Operational Guidelines for the Implementation of the World Heritage Convention recognise that sustainable use can be consistent with the protection of cultural and natural sites. For one category of heritage, sustainable use is explicitly recognized as an intrinsic part of the value, namely in cultural landscapes. Finally, World Heritage sites play an important role towards the overall sustainable development of communities, in particular through the promotion of tourism, and through the provision of a range of different good and services, including ecosystem services.<sup>58</sup>

79. The objectives of the UNCCD are to combat desertification and mitigate the effects of drought. In several places the text of the convention emphasises the importance of the sustainable management of land and water. Article 10.4 states that Parties, in developing national action programmes, should include measures such as 'sustainable management of natural resources' and 'sustainable agricultural practices'. References to sustainable use also appear in some of the decisions of the Parties.<sup>58</sup>

80. The UNFCCC contains the obligation on Parties to 'Promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans, as well as other terrestrial, coastal and marine ecosystems' (UNFCCC Article 4 (d)). The Kyoto Protocol to UNFCCC calls on Annex I Parties to promote sustainable forest practices and sustainable forms of agriculture (Kyoto Protocol Article 2 (a) (ii) & (iii)).<sup>58</sup>

81. Sustainable use of plant genetic resources is central to the objectives of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGR). The objectives of this Treaty are the conservation and sustainable use of plant genetic resources for food and agriculture and the fair and equitable sharing of the benefits arising out of their use. In Article 6 of the Treaty, the Contracting Parties agree to develop and maintain appropriate policy and legal measures that promote the sustainable use of plant genetic resources for food and agriculture.

82. The Biodiversity Liaison Group includes the six biodiversity-related conventions: CBD, CITES, CMS, ITPGR, Ramsar, and WHC. At its fifth meeting held in Gland Switzerland on 14 September 2006, it agreed that there was a common interest in further capacity development, training, and information on the AAPG and their relevance in the context of each of the biodiversity-related conventions. CITES thus prepared a CD-ROM on the application of the AAPG within the biodiversity-related conventions.<sup>ix</sup>

## V. AVAILABLE INDICATORS FOR SUSTAINABLE USE

83. Several indicators for sustainable use exist within and across sectors. Many of these indicators have been approved by the Conference of the Parties of the CBD to measure progress towards the 2010

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<sup>ix</sup> Available online: <http://www.cbd.int/sustainable/>

Biodiversity Target. These include the Living Planet Index, the Red List Index, the Marine Trophic Index, and the Ecological Footprint.

84. The Living Planet Index (LPI) is calculated by using data on more than 6,400 populations of over 2,000 species of mammal, bird, reptile, amphibian and fish from land, freshwater and marine habitats all over the world. It shows the average trends of these populations since 1970. The latest global calculation of this index is that between 1970 and 2005, the average population of species fell by one-quarter.

85. The Red List Index (RLI) monitors the trends in the status of species by evaluating the number of species that moved from one category to another between assessments owing to a genuine improvement or deterioration in status (i.e. category changes owing to revised taxonomy or improved knowledge are excluded). It is based on the list produced annually by the International Union for the Conservation of Nature (IUCN), reporting on the risk of extinction faced by all species whose status has been assessed. There has been a steady and continuing deterioration in the threat status (projected extinction risk) of the world's birds between 1988 and 2008.<sup>2</sup>

86. The Marine Trophic Index (MTI)<sub>x</sub> indicates the average position in the food web of fish being caught at a particular point in time, and is therefore a signal of the overall health and integrity of ocean biodiversity. The MTI will drop as populations of predatory fishes decline to the benefit of smaller fish and invertebrates. An increase in MTI does not necessarily indicate sustainable use, as the MTI will increase, for example, if fishery is halted because the stock is at a very low level, even if the stock remains critically low.

87. The Ecological Footprint links the consumption of individuals, countries and humanity as a whole with the capacity of the world's ecosystems to meet those demands into the long term. The footprint is expressed in terms of the area of biologically-productive land and water needed to provide the resources we use and absorb our wastes. This is then compared with *biocapacity*, the area available to regenerate living resources and absorb people's waste, especially in the form of carbon dioxide emitted from the burning of fossil fuels for energy.

88. The European Environment Agency indicator factsheets to assess progress towards the European 2010 biodiversity target include two indicators relevant to sustainable use of agricultural biodiversity. Nitrogen balance, displayed as the nitrogen balance per hectare of agricultural land, is one indicator. However, to assess the actual environmental impact of excess nitrogen, more information is needed on farm nitrogen management, soil type, and climate conditions, all of which play a role in the fate of nitrogen in the environment. Another indicator in the agricultural sector is the area under management practices potentially supporting biodiversity.<sup>17</sup>

89. Other indicators related to agriculture include the proportion of organic farming, when it follows specific guidelines. The proportion of native breeds that is endangered is an indicator of livestock genetic diversity.

90. The Ministerial Conference on the Protection of Forests in Europe (MCPFE) has elaborated a complete set of 35 forestry sector indicators within six criteria. One of these indicators is the growing stock, or ratio of felling to increment. This indicator shows whether biomass in trees is increasing or decreasing, although it does not take into account tree biodiversity, age classes, the type of forest

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<sub>x</sub> Most preferred fish catches consist of large, high value predatory fish, such as tuna, cod, sea bass and swordfish. The intensification of fishing has led to the decline of these large fish, which are high up in the food chain. As predators are removed, the relative number of small fish and invertebrates lower in the food chain tends to increase and the mean trophic level (i.e. the mean position of the catch in the food chain) of fisheries landings, goes down. The mean trophic level of a species is a calculated value, which reflects the species abundance balance across a trophic range from large long living and slow growing predators to fast growing microscopic primary producers. It is therefore a reflection of the biodiversity status of the system. It is derived by assigning a numerical trophic level to selected taxa, established by size, diet or nitrogen isotope levels.

management employed, or other biodiversity-related factors. Another indicator of the conservation value of a forest is the amount of deadwood (coarse woody debris), which is a proxy indicator for invertebrate biodiversity, as deadwood harbours a wide array of organisms.<sup>17</sup>

91. The status of commercial fish stocks can also be used as an indicator for the fisheries sector. For example, of the assessed European commercial stocks, about 45% are outside safe biological limits. A stock is considered to be outside 'Safe Biological Limits' (SBL) when the Spawning Stock Biomass (SSB) (the mature part of a stock) is below a biomass precautionary approach reference point (Bpa), or when fishing mortality (F) (an expression of the proportion of a stock that is removed by fishing activities in a year) exceeds a fishing mortality precautionary approach reference point (Fpa), or when both conditions exist. With respect to aquaculture, effluent water quality from fish farms can be used as an indicator.

92. The list of indicators presented here is by no means exhaustive. Parties have reported on additional indicators in the fourth national reports, as mentioned in section 2 under the various sectors. Several Parties mentioned, in their fourth national reports, a lack of standards and indicators to implement policies, programs, and adaptive management as a major obstacle to sustainable use.

## VI. CASE-STUDIES

93. The following table gives examples of Parties implementing Goal 4 of the 2010 Biodiversity Target, to promote sustainable use and consumption:

Target	Example
<b>Focal Area: Promote sustainable use</b> <b>Goal 4. Promote sustainable use and consumption.</b>	
4.1: Biodiversity-based products derived from sources that are sustainably managed, and production areas managed consistent with the conservation of biodiversity.	<ul style="list-style-type: none"> <li>• <b>Morocco</b> – A co-management agreement between the High Commission for Water, Forests and to Combat Desertification (<i>Haut Commissariat aux Eaux et Forêts et à la Lutte Contre la Désertification</i>) and a women’s cooperative was established in the Eastern region of the country related to wild rosemary. As part of the agreement the cooperative has the right to use and sell extracts and essential oils extracted from 22,000 hectares of wild rosemary in exchange for sustainably exploiting the resource and allowing sufficient time for its recovery.</li> <li>• <b>Sweden</b> - The Swedish Board of Fisheries has started a co-management programme for the fishing industry based in Vättern, the second largest lake in Sweden. The aim of the project is to reach long-term sustainable fishing in the lake. The co-management project is carried out under the auspices of the Lake Vättern Society of Water Conservation, in which municipalities, companies, and county administration boards participate. The work undertaken as part of this programme include, amongst other things, an analysis and possible adaptation of fishing guidelines for the lake, the production of information brochures, and the evaluation of no-fishing zones in the lake. This programme is one of 6 co-management pilot projects commissioned by the government.</li> <li>• <b>United Kingdom</b> - Across the country the percentage of woodlands under certified management schemes increased from 37 per cent in 2001 to 45 per cent in 2008. Similarly 36% of the agricultural land in the country is under agri-environment schemes.</li> <li>• <b>South Africa</b> - 80% of commercial forest plantations are managed according to Forestry Stewardship Council standards.</li> <li>• <b>Czech Republic</b> - 7.36% of all agricultural land is devoted to organic agriculture. The country has set an objective of increasing the share of organic agricultural land of at least 6% by 2005 and to at least 10% by 2010. If current trends persist this target will be met.</li> </ul>

4.2: Unsustainable consumption, of biological resources, or that impacts upon biodiversity, reduced.	<ul style="list-style-type: none"> <li>• <b>Morocco</b> – A co-management programme in the Kenitra region related to wood resources was established. The co-management agreement allows local coops to manage the wood resources and in its first year reduced illegal logging by 98%.</li> <li>• <b>Sri Lanka</b> - As part of the National Forest Policy (1995) and National Wildlife Policy (2000) a moratorium on state mediated logging of all Wet Zone forests was introduced in the 1990's. As a result most of the logged forests in Wet Zone are now regenerating.</li> <li>• <b>Armenia</b> - The prevalence of illegal logging has been reduced over the last few years. In 2003 it was estimated that 42 236 trees were illegally felled while in 2008 the number of illegally harvested trees was 2080.</li> </ul>
4.3: No species of wild flora or fauna endangered by international trade.	<ul style="list-style-type: none"> <li>• <b>Turkmenistan</b> – Prohibiting the export of snakes for the last 15 years allowed for the populations of the Central-Asian cobra (<i>Naja oxiana</i>) and lebetina viper (<i>Macrovipera lebetina</i>) to increase two fold and it has been proposed to reclassify them from “rare and disappearing species” to “restored species”</li> <li>• <b>Dominica</b> – The population of the endemic Imperial Parrot (<i>Amazona imperialis</i>) has increased to some 250 mature individuals from a previous low, in 1993, of just 80 to 100 individuals. If the current increasing population trend continues the species will eventually be down listed from endangered to vulnerable. The species is listed under Appendix I and II of CITES.</li> </ul>

94. An example of monitoring of sustainable use involves the National Space Research Institute (INPE) of Brazil, which publishes highly-detailed information on the scale and pattern of deforestation and forest degradation in the Brazilian Amazon. Systematic analysis of satellite images provides encouraging evidence that the annual deforestation rate has slowed substantially since it reached a peak of more than 27,000 square kilometres in 2003. The loss of forest in 2007-8 was just under 13,000 square kilometres, representing a reduction in the rate of decline of nearly 53%. However, a new methodology developed by INPE to measure forest degradation, from the same images, suggests a worrying trend in the opposite direction. The first consolidated results, published in 2009, indicated that while clear-cut deforestation in the Brazilian Amazon remained nearly constant between 2007 and 2008, the area of degraded forest increased by more than 70%, from nearly 16,000 square kilometres in 2007 to more than 27,000 square kilometres in 2008.

## VII. APPLICATION OF THE AAPG BY INTERNATIONAL FORUMS, MAJOR PARTNERS, INITIATIVES, AND ORGANIZATIONS

95. A notification entitled “Guidance for the submission of information for the review of the application of the Addis Ababa Principles and Guidelines for the Sustainable Use of Biodiversity (AAPG)” was sent to over 250 representatives from over 120 international and national organizations and to CBD focal points. Submitters were asked to provide case-studies and lessons learned from the implementation of the AAPG, provide suggestions for modifications, if applicable, and provide information on the links, if any, between the AAPG and other conceptual frameworks for sustainable use of biodiversity.<sup>x</sup>

96. Eight submissions were received. Most reporting organizations demonstrated how the AAPG have been applied to carry out their respective mandates. Some submissions spoke to the added value the AAPG in implementing sustainable use, notably by using the AAPG as a springboard for developing sector-specific frameworks for sustainable use, such as the European Charter on Hunting and Biodiversity. The other submissions are summarized below:

<sup>x</sup> Full notification available at: <https://www.cbd.int/doc/notifications/2009/ntf-2009-012-su-en.pdf>.

97. The Secretariat of the Bern Convention reported on the "European Charter on Hunting and Biodiversity", which was agreed upon by Parties to the Bern Convention in November 2007 and which has received the endorsement of governments, environmental organizations and hunting associations in Europe. The Charter promotes principles and guidelines intended to ensure that hunting and hunting tourism in Europe are practiced in a sustainable manner. The Charter drew on the Addis Ababa Principles and the Malawi Principles to derive 12 fundamental charter principles. The Charter was developed in cooperation with IUCN – The World Conservation Union, BirdLife International, the Federation of Associations for Hunting and Conservation of the EU (FACE) and CIC - International Council for Game and Wildlife Conservation. As a result of the Charter, the Bern Convention is now planning to develop a Charter on Angling and Biodiversity which will adopt a similar framework based upon the AAPG and Ecosystem Principles.

98. The FairWild Foundation reported on its project to harmonize together two standards, the International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants (ISSC-MAP) and the FairWild Standard, in order to implement a unified system of certification for the collection of wild plants.

99. The FAO reported on activities undertaken in the animal genetic resources sector in the application of the AAPG. With respect to principle 2 on the empowerment and accountability of local users, the FAO produced two documents highlighting the important contribution of small-scale livestock keepers: “The roles of small-scale livestock keepers as custodians of animal genetic resources”<sup>6</sup> and “Contributions of smallholder farmers and pastoralists to the development, use and conservation of animal genetic resources.”<sup>7</sup> With respect to Principle 4 on adaptive management, the FAO prepared several documents on the status and trends of animal genetic resources, such as the State of the World’s Animal Genetic Resources for Food and Agriculture. The FAO also presented its “Draft guidelines for establishing animal breeding strategies in low- and medium-input production systems”, which aim to assist member countries to better utilize their limited capacity to plan and develop effective genetic improvement programmes in low- and medium-input production environments, and to maximize the changes of their being sustained.

100. The IUCN/SSC Regional Group for Europe of the Sustainable Use Specialist Group (ESUSG) drew attention to a project entitled “Governance and Ecosystem Management for the Conservation of Biodiversity” (GEM-CON-BIO), co-financed by the European Commission. GEM-CON-BIO ran for two years with the strategic objective to explore the interactions between governance modes and sustainable development objectives in view of identifying what governance processes and institutions can best contribute to the conservation of biodiversity. This objective was framed with reference to the governance principles within AAPG. A publication summarizes the outcomes of the project, which provide strong support from quantitative studies for AAPG principles 3, 4 and 10, with conceptual underpinnings for principles 1, 5, 6, 7, 9 and 14.<sup>41</sup> The IUCN also reported on a symposium held in London in 2006, jointly organised by the SUSG of IUCN/SSC and the Zoological Society of London, which addressed the impact of recreational hunting around the world on wildlife and livelihoods from a perspective of sustainable use.<sup>11</sup>

101. The Safari Club International Foundation (SCIF) provided information on sustainable hunting in the United States. The SCIF believes that the system that has evolved in the U.S. exemplifies most of the principles set forth in the AAPG. At the beginning of the 20<sup>th</sup> Century, commercial hunting placed many species of wildlife at danger of extinction. A series of actions were taken, including outlawing commercial hunting, creating science-based regulations on access to wildlife, and setting up wildlife management agencies. The federal government levied an excise tax on hunting and fishing equipment and provided the funds back to state wildlife agencies, which matched these grants with funds generated from the sale of state hunting and fishing licenses. Funds generated since 1937 have allowed over four million acres of land to be purchased for wildlife restoration and forty million acres to be managed under cooperative agreements. Both government, by providing the technical expertise for management and by

setting the regulations that governed use, and hunters, by providing funding for sustainable management of wildlife, shared responsibility for the resource.

102. The CMS Secretariat reported on principles 4, 10, 13, and 14. CMS species agreements, memorandums of understanding, action plans and conservation and management plans address principle 4 on adaptive management. Convention appendices address principle 10 on international and national policies taking into account current and potential values derived from the use of biological diversity, the intrinsic and other non-economic values of biological diversity and market forces affecting the values and use. The newly established Strategy on Migratory Species Conservation reflects principle 13 on the costs of management and conservation of biological diversity being internalized within the area of management and reflected in the distribution of the benefits from the use. To address principle 14 on education and public awareness programmes on conservation and sustainable use, a priority of CMS is to develop materials on the conservation of Migratory Species.

103. The CIC - International Council for Game and Wildlife Conservation reported that they have been involved in publishing publications pertaining to the sustainable use of wildlife. These include a joint FAO-CIC publication entitled *Developing sustainable Wildlife Management Laws in Western and Central Asia*<sup>7</sup>, and a joint FAO-CIC publication entitled *Guidelines for Developing sustainable wildlife management laws*, which translate the AAPG into the context of hunting laws and have global relevance

### VIII. REPORT ON APPLICATION OF ARTICLE 10 AND THE AAPG BY PARTIES

103. A synthesis of inputs on sustainable use and the AAPG in the third and fourth national reports (based on 53 reporting Parties from national reports in English, French, or Spanish, as of 1 December 2009) indicates that:

(i) Almost all reporting Parties included the sustainable use of biological resources as an objective in their National Biodiversity Strategy and Action Plans (NBSAPs). Several Parties reported on the integration of sustainable use considerations in legislation, including environmental laws and sector-specific legislation, such as fisheries and forestry codes. In addition, all Parties reported that they have integrated the sustainable use of biological resources in policy frameworks for at least one of the following sectors: agriculture, forestry, fishery, tourism, and wildlife hunting and trade;

(ii) The unsustainable use/overexploitation of resources was reported as being a threat to biodiversity in most fourth national reports;

(iii) Approximately 25% of reporting Parties have developed tangible indicators to measure sustainable use. Indicators include: the number of fish refuges; the number of forest or fisheries law infringement cases; the number of species exported; the total volume and annual increase of standing stock (volume of all trees growing in a certain land area); the difference between nitrogen input and output (as an indicator of the application rate of agrochemicals and the impact of agricultural activities on biodiversity); and the ecological footprint<sup>xii</sup>;

(iv) According to third national report submissions (reporting Parties as of 11 November 2009), more than 50% of reporting Parties had initiated application of the AAPG while 26% were in the process of reviewing the AAPG;

(v) Parties were not asked to report specifically on the AAPG in the fourth national reports. Four Parties voluntarily submitted information on the AAPG. Madagascar applied the AAPG in the process of establishing new protected areas. Australia's fourth national report mentions that the AAPG are consistent, where possible, with the Part 13A of the Environment Protection and Biodiversity Conservation Act. Sweden reported on the use of the AAPG by the Swedish Board of Fisheries, the

<sup>xii</sup> The Ecological Footprint is an aggregate measure of the demands that resource consumption places on ecosystems and species. The Ecological Footprint measures humanity's demand on the biosphere in terms of the area of biologically productive land and sea required to provide the resources we use and to absorb our waste. More information is available at [http://assets.panda.org/downloads/living\\_planet\\_report\\_2008.pdf](http://assets.panda.org/downloads/living_planet_report_2008.pdf)



authority responsible for conservation and exploitation of Sweden's fish resources, which produced a report on how to apply the ecosystem approach and the AAPG in fisheries management.

(vi) The government of Japan submitted information on the management of sustainable rural landscapes in Japan, such as case-studies on the 'satoyama', a traditional Japanese socio-ecological production system. In recognition of the potential of such sustainable use of landscapes to enhance human well-being and biodiversity, an initiative called *Satoyama* Initiative is being proposed to promote the rebuilding and enhancement of sustainable ties between humans and the natural environment through optimized use and management of land and natural resources. A consultative process is under way to develop the initiative and establish an international partnership as a supporting and awareness-raising mechanism in support of the implementation of the Convention, to be launched at the tenth meeting of the Conference of the Parties.<sup>xiii</sup>

(vii) The Ecosystem Approach is more often mentioned by Parties in the 4<sup>th</sup> National Reports. As acknowledged in decision VII/12, the AAPG is not a competing but rather complementary approach to the ecosystem approach and other approaches mentioned by Parties, such as sector specific guidelines. In addition, many principles of the AAPG exist in other management approaches and are implemented in projects and other activities without reference to the AAPG.

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<sup>xiii</sup> More information is available at <http://satoyama-initiative.org/en/>

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