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DRAFT GLOBAL OUTCOME-ORIENTED TARGETS FOR THE PROGRAMME OF WORK ON INLAND WATER ECOSYSTEM BIOLOGICAL DIVERSITY

Note by the Executive Secretary

I. INTRODUCTION

1. At its seventh meeting, in decision VII/30 paragraph 12 (c), the Conference of the Parties requested the Executive Secretary to refine the proposals for outcome-oriented targets for the programme of work on the biological diversity of inland waters.

2. Draft outcome-oriented targets for the Programme of Work on the biological diversity of inland water ecosystems were first developed in response to paragraph 4 (b) of recommendation VIII/2 of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA), in which SBSTTA requested the Executive Secretary to prepare a schedule of short, medium and long-term outcome-oriented targets and deadlines for implementation of the Programme of Work, for consideration by the national focal points and then by SBSTTA prior to the seventh meeting of the Conference of the Parties.

3. The proposed targets for the programme of work on the biological diversity of inland water ecosystems (UNEP/CBD/SBSTTA/9/14/Add.1) were discussed in depth at the ninth meeting of SBSTTA under a general agenda item on integration of outcome-oriented targets into the programmes of work of the Convention.

4. Decision VII/30, paragraph 12 (c), of the Conference of the Parties also requested that the integration of outcome-oriented targets into the programme of work on the biological diversity of inland water ecosystems proceed according to the framework in annex II of that decision and using the approach set out in its annex III, identifying more precise targets, including, as appropriate, quantitative elements.

5. Therefore, as far as practical, the targets should adhere as closely as possible to those developed for the Strategic Plan – with minor re-wording as and where required and, where feasible, with appropriate quantification. Specifically, the proliferation of targets for the programme of work should be avoided.

* UNEP/CBD/SBSTTA/10/1.

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6. The targets developed should bear in mind that other conventions and processes have or may develop outcome-oriented targets. These should be considered in relation to targets set under the Convention on Biological Diversity. In general, those conventions or processes that deal more specifically with inland water issues might be anticipated to have more specific targets. Particular note is made of the Ramsar Convention, which is the lead partner for the Programme of Work of the Convention on Biological Diversity on the biological diversity of inland water ecosystems. It is anticipated that the Ramsar Convention may set much more detailed targets which might function as "sub-targets" under the targets for inland waters of the Convention on Biological Diversity (similarly for marine and coastal wetlands). Such an approach would avoid "target proliferation" under the Convention on Biological Diversity.

7. Targets must be verifiable. Therefore, viable indicators should exist for each target set and there should be in existence a reporting (monitoring) system for the provision of indicator data. Whilst indicators are to be finalized subsequent to the development of targets, all three elements (targets, indicators, reporting/monitoring) must be considered in relation to each other.

8. In response to decision VII/30 paragraph 12 (c), the Executive Secretary undertook the following activities:

(a) Convened an electronic discussion forum from 15 July to 15 October 2004, to seek expert opinion on the proposed targets, and their rationale; and

(b) Convened an Expert Group Meeting to consider the draft global outcome-oriented targets for the Programme of Work, in Montreal, from 25-27 October 2004, kindly sponsored by the Governments of the Netherlands and the United Kingdom of Great Britain and Northern Ireland. The full report of the expert meeting is presented in UNEP/CBD/SBSTTA/10/INF/6.

9. The outcome of this process has been synthesized by the Executive Secretary and the proposed revised draft global outcome-oriented targets, with their rationale, for this Programme of Work are presented in section II of this note.

10. The proposed vision and mission of the Programme of Work on the biological diversity of inland water ecosystems, to which these targets relate, are presented in document UNEP/CBD/SBSTTA/10/8, which also contains a discussion of how the Programme of Work relates to other relevant processes and their targets (including the Millennium Development Goals, the Plan of Implementation of the World Summit on Sustainable Development, other biodiversity related conventions and in particular the Ramsar Convention on Wetlands, United Nations organizations and other related initiatives and processes).

11. The activities required to achieve these targets for the Programme of Work on the biological diversity of inland water ecosystems are presented in detail in the work programme itself (decision VII/4).

12. Draft recommendations relating to these targets are contained in document UNEP/CBD/SBSTTA/10/8.

II. DRAFT GLOBAL OUTCOME ORIENTED TARGETS FOR THE PROGRAMME OF WORK ON THE BIOLOGICAL DIVERSITY OF INLAND WATER ECOSYSTEMS

13. The following goals and targets are based upon those for the implementation of the Strategic Plan of the Convention as detailed in decision VII/30 annex II. Those targets are quoted *verbatim* here as **Overall Targets**, which are then applied to the programme of work on inland water ecosystem biological diversity and where necessary re-worded to make them more appropriate to that context.

14. Where mentioned, quantitative targets refer to those thought to be ambitious but achievable by the year 2010, as a contribution to the 2010 biodiversity target. They are not meant to imply that these are the ultimate desired states.

15. For the purposes of definition, identification and classification of inland water ecosystems, the Conference of the Parties to the Convention on Biological Diversity (decision VII/4, paragraph 27) has recognized that the Ramsar Classification of Wetland Type should be applied as an interim classification for the implementation of the Programme of Work on the biological diversity of inland water ecosystems. The Ramsar definition of "wetland" includes all inland water ecosystem types, including man-made ecosystems (for example, it includes river channels, lakes, reservoirs, estuaries and underground waters as wetlands).

A. Protect the components of biological diversity

Goal 1. Promote the conservation of the biological diversity of ecosystems, habitats and biomes

Overall Target 1.1: At least 10 per cent of each of the world's ecological regions effectively conserved.

Application to inland water ecosystem biological diversity: This target is not considered applicable to inland water ecosystems at present.

Technical rationale

16. The application of a percentage based target to areas or regions of inland water ecosystems is not considered appropriate because currently there is no reliable figure for the overall extent of inland ecosystem at the global level. Attempts to quantify this, using a variety of methods, have resulted in widely varying estimates, the highest of which is still considered an underestimate. Apart from a lack of data there are particular problems with trying to obtain "area"-based estimates for fluvial systems (rivers) and wetlands with seasonally changing extents (e.g., floodplains or other areas intermittently flooded). Therefore, a percentage of an unknown quantity is not a meaningful figure.

17. The concept of ecological regions is also complex for inland waters. Any such categorization would need to be catchment (river basin) based, and there are many such regions, and even adjacent ones can differ significantly in their aquatic fauna and flora. Grouping by major biogeographic category might be possible but using different taxa would yield different results (for example, birds *versus* fish). The biogeographic distribution of river catchments, possibly into larger groupings, will be assisted by the forthcoming WWF inland water ecoregions assessment. It is likely that the ecoregions that would be appropriate for inland waters would not necessarily be the same as those using terrestrial criteria.

18. For inland waters the term "effectively conserved" requires that the entire catchment be managed in accordance with the need to maintain the ecological integrity of, and goods and services provided by, inland waters. It is therefore inappropriate, for this particular work programme, to suggest that any part of the catchment may be used in a fashion which undermines such integrity of inland waters. This is addressed more directly under target 5.1 (and 8.1). This does not imply that parts of a catchment cannot be developed or used sustainably by the sectors, but it does require that such use is planned and managed within the catchment context, taking into account downstream impacts on inland waters, consistent with the ecosystems approach. To suggest that 10 per cent, or even a considerably higher figure, of these ecosystems need to be effectively conserved, suggests that the remainder could continue to be extensively degraded and converted. This is not only contrary to the Convention but the Millennium Assessment makes it clear that such a trend would further constrain the achievement of the Millennium Development Goals.

19. The quality of data on ecosystem extent varies greatly by region and ecosystem type. Some reasonably robust sources of information do exist, but they are not usually global and only refer to specific ecosystem categories. However, such sources of data can be useful to provide indicators of trends in inland water ecosystems. For example, trends in peatland status and extent are a potentially useful indicator (see document UNEP/CBD/SBSTTA/10/9). The Ramsar Convention, and its Scientific and Technical Review Panel (STRP), are already working extensively on improving information on the status and trends of wetlands and relevant indicators. It is expected that this process will explore how to address this particular target in the longer term.

20. The objective of this target to conserve areas that are representative of the variety of ecoregions that exist, is accommodated under the wording of target 1.2 for inland waters (below), whilst targets 5.1 and 8.1 address achieving effective conservation within the ecosystem approach.

Overall Target 1.2: Areas of particular importance to biodiversity protected.

Application of the target to inland water ecosystem biological diversity: *275 million hectares of wetlands 1/ of particular importance to biodiversity protected, including representation and equitable distribution of areas of different wetland types across the range of biogeographic zones.*

Technical rationale

21. As per the rationale for target 1.1, a percentage based figure for area is not appropriate for inland water ecosystems. This quantitative area based target was derived from the target for area designated as Ramsar sites by 2010 (ref. Ramsar Strategic Plan 2003-2008), by using data only for inland water ecosystems. The Ramsar target is based on projections of previous site designation trends, plus an allowance for an ambitious but achievable increase in the rate of site designation. The resulting figure (2010 target for area of inland Ramsar sites) was then increased to account for non-Ramsar Parties and the fact that other protected areas, besides Ramsar sites, are common (data exist enabling an estimation of the latter with reasonable confidence).

22. This area based target does not require detailed wetland inventories but it is stressed that such should still be complied as a high priority. The Ramsar Convention has called upon its Parties to have at least initiated wetland inventories, including information on wetland importance and potential Ramsar sites, by 2005, to be used *inter alia* as the basis for establishing a strategy and priorities for future Ramsar site designations.

23. For the present purposes, "areas of particular importance" are those identified using the Ramsar site designation criteria (http://www.ramsar.org/key_criteria.htm), which can be used irrespective of whether a particular site is declared or not under the Ramsar Convention. These criteria, strictly speaking, refer to sites of international importance but the criteria can be applied directly, or modified as appropriate, at the national level. Equitable distribution across biogeographic zones refers to the need to ensure adequate representivity of different wetland types and amongst biogeographic zones.

24. For the purposes of the application of this target, "protection" is taken to include those areas under informal management systems, beyond the confines of officially designated protected areas, consistent with the programme of work on protected areas (e.g., activity 1.1.4 recognizes innovative types of protected areas such as those run by government agencies at various levels, co-managed protected areas, private protected areas, indigenous and local community conserved areas; activity 2.1.2 refers to recognizing and promoting a broad set of protected area governance types related to their potential for achieving biodiversity conservation goals in accordance with the Convention, which may include areas conserved by indigenous and local communities and private nature reserves).

25. Protected areas can be effectively conserved only if the larger ecosystems in which they are situated are managed to prevent or mitigate adverse impacts. This is particularly true of inland water protected areas. They are vulnerable to changes in water quality, quantity, and timing and volume of flows caused by activities often far beyond their boundaries. Thus, inland water protected areas must be part of a larger multi-sectoral management framework, such as integrated river basin management, that applies to the basin in which the protected area is located. This is in line with the adoption at the seventh meeting of the Conference of the Parties of the ecosystem approach as the primary framework for addressing the objectives of the Convention (decision VII/11, paragraph 2). These requirements are partly met under goals 5 and 8.

1/ Recalling the preamble to this section that the Ramsar definition of "wetland" is used which is effectively the same meaning as "inland water ecosystems". The term is used for consistency with the Ramsar Convention where the current target originates.

26. Indicators for this target already exist using data compiled by the Secretariat of the Ramsar Convention and they are currently being improved and elaborated by the Ramsar STRP. These can also be used as a measure for the related indicator (coverage of protected areas) for overall target 1.2 (see UNEP/CBD/SBSTTA/10/9).

Goal 2. Promote the conservation of species diversity

Overall Target 2.1: Restore, maintain, or reduce the decline of populations of species of selected taxonomic groups.

Application of target to inland water ecosystem biological diversity: *Reduce the decline of, maintain or restore populations of species of selected taxonomic groups dependent upon inland water ecosystems.*

Technical rationale

27. This target can be applied directly to inland water ecosystem biological diversity without modification. The target is reworded to better reflect the presumed intention of the overall target.

28. It is assumed that "population" means both absolute number (abundance) of individuals and the number of distinct populations (and sub-populations) of individuals (the latter refers to genetic diversity).

29. Data on trends in species for inland water ecosystems are generally very difficult to obtain, and often inaccurate, although reasonably reliable data do exist for certain taxa. The target can be further refined and quantified in relation to specific taxa. Reliable data are often available for those taxa that are popular with special interest groups; for example, for at least many waterbirds, some groups of freshwater fish, aquatic mammals, most amphibians and many reptiles. The "sample of species" can be based on these existing sources of data but it will be biased. Unfortunately, knowledge is often absent for taxa that can be important for livelihoods, particularly of the rural poor, and therefore considerations of sustainable use. One problem is the very poor quality and quantity of global data at the species level for fisheries in inland waters. 2/

30. For the purposes of indicators, note is made that the target includes at least two different objectives (targets) – to "restore" and to "reduce decline or maintain". These are different things, the latter being much easier to obtain indicators for. Potential indicators for the overall target include "trends in abundance and distribution of selected species" and the "change in status of threatened species" (UNEP/CBD/SBSTTA/10/9). Data for these are available, *inter alia*, through the IUCN Red List and can be compiled for species dependent upon inland waters (although the data need to be scrutinized and adjusted because categorization is sometimes based upon taxonomic and not ecological criteria; for example many species of fish from "marine" taxa are actually threatened in freshwaters – e.g. sturgeon and salmon). The potential indicator "coverage of protected areas" has also been suggested for the overall target. This indicator is discussed in more detail under goal 1.2.

Overall Target 2.2: Status of threatened species improved.

Application of target to inland water ecosystem biological diversity: *Known threatened and endangered species of plants and animals dependent inland water ecosystems conserved.*

Technical rationale

31. This target refers to the status of *known* threatened species – that is, for example, as per the IUCN Red List. The target for the Global Strategy for Plant Conservation is 60 per cent. However, the number of inland water dependent species listed is very likely a small fraction of those actually threatened. There is also a strong argument that if a species is known to be under threat then something should be done to improve its conservation status. Therefore the target should be 100 per cent.

32. References to the conservation of species *ex situ* (e.g., for plants) is not considered feasible for most inland water ecosystem biological diversity (except certain plant groups – which are assumed to be considered under the Global Strategy for Plant Conservation). Although *ex situ* conservation techniques

2/ As acknowledged by the FAO itself (www.fao.org).

for other taxa (e.g., fish) are emerging (e.g., cryopreservation), the technology is more complex and there is limited confidence that *ex situ* conservation is sustainable for large numbers of taxa.

33. Many threatened species dependent upon inland water ecosystems are migratory. This requires that viable populations of such animals are maintained throughout their natural range and that migratory corridors between critical areas allow movements which enable the species to complete their natural life-cycles.

34. Potential indicators for this target include those as per target 2.2 including the provisions listed there. References to the need to correct the red-list data, when referring to inland water dependent species, under goal 2.1 also apply here.

Goal 3. Promote the conservation of genetic diversity

Overall Target 3.1: Genetic diversity of crops, livestock, and of harvested species of trees, fish and wildlife and other valuable species conserved, and associated indigenous and local knowledge maintained.

Application of the target to inland water ecosystem biological diversity: *Further losses of known genetic diversity of crops, livestock, and of harvested species of trees, fish and wildlife and other valuable species dependent upon inland water ecosystems prevented and associated indigenous and local knowledge maintained.*

Technical rationale

35. Genetic diversity includes variation within and among populations. Genetic diversity within a population may be lost through reduction of overall population size caused by, for example, direct exploitation, habitat alteration and destruction, toxic materials, and invasive species. Loss of genetic variation reduces adaptability to rapid environmental change (either natural or human-induced), and the ability to recover from over-exploitation. Severe selective pressures (through fishing) may also cause loss of genetic diversity. Because most fisheries are selective in targeting the largest and oldest individuals, intensive fishing can reduce the age and size at which fish mature, potentially leading to genetic change. A major threat to genetic diversity in inland waters is the impact of aquaculture (through poor broodstock management, and in particular inappropriate hybridization, and the release of invasive genotypes into the wild).

36. This is an important target for inland waters due to: (i) the high level of genetic diversity occurring there (due mainly to the zoogeographic isolation of aquatic species between different catchments or sub-catchments), and (ii) the high levels of threats from rapidly expanding aquaculture.

37. Because genetic diversity of species in inland water ecosystems as a whole is poorly known, the target focuses on exploited and cultured fish and other valuable species with known genetic diversity. Knowledge of genetic diversity in inland water ecosystems is available for a limited number of taxa. Therefore, the proportion of genetic diversity for which data are available is very small. The target of conserving all known genetic diversity is therefore proposed, consistent with the goal. This target is too broad to be able to identify meaningful quantified targets, although quantified targets might be developed for individual species groups, in particular species in commercial use in aquaculture (particularly salmoniids, tilapias and carps). More specific outcome-oriented targets, with indicators, can be developed and applied at the regional and national levels for these. Quantified targets could also likely be developed for major wetland dependant agricultural crops, and in particular rice, and for populations and sub-populations of migratory water birds.

38. The wording of the overall target has origins in agriculture and is strictly speaking not entirely appropriate for inland water ecosystems (for example, the species used in aquaculture are not normally termed “crops” or “livestock”). For clarity, it is assumed that this target refers to wild species that form the basis of harvest (mainly fisheries) and to domesticated species (mainly in aquaculture), including their wild relatives. The inclusion of wild relatives is important because a major issue is the impact of

domesticated strains/varieties on wild genetic diversity (and that diversity may not be the basis of the main harvest).

39. Potential indicators for this target might include: status and trends in biogeographic populations of inland water dependent birds (and it is noted that this group represents a significant deviation from the concept that genetic information is only available for domesticated species or those in commercial use); a number of crops, and in particular rice; and several fish species (notably salmoniids, and probably also carps and tilapia). Also, a number of process indicators will help to identify progress towards conserving genetic diversity in situations where more direct outcome-oriented targets (with quantifiable indicators) are difficult to apply. For example: adoption and implementation of policies and procedures for the conservation of genetic diversity by the aquaculture and other relevant sectors (including monitoring implementation of the Code of Conduct for Responsible Fisheries of the FAO and application of the Addis Ababa principles and guidelines for sustainable use). 3/

B. Promote sustainable use

Goal 4. Promote sustainable use and consumption

Overall Target 4.1: Biodiversity-based products derived from sources that are sustainably managed, and production areas managed consistent with the conservation of biodiversity. 4/

Application of the target to inland water ecosystem biological diversity (Subtarget 4.1.1): *Products from inland water ecosystem biological diversity derived from sustainable sources;*

Application of the target to inland water ecosystem biological diversity (Subtarget 4.1.2): *Aquaculture areas in inland water ecosystems managed consistent with the conservation of inland water biological diversity.*

Technical rationale

40. This target is divided into two sub-targets to distinguish between areas managed for capture fisheries (etc.), which are often in "natural" habitats, and those areas under more intensive management used for culture. The targets may be similar but indicator information will very likely be quite different. It is necessary to separate trends in aquaculture from trends in capture fisheries.

41. This target is assumed to refer to "exploitation" of natural resources (that is, mainly capture fisheries but also hunting and gathering of non-fisheries products). "Sustainably managed" can refer to the need to manage the environment for sustainability (a high priority for sustaining production from inland waters), as opposed to sustainable exploitation (catching). Targets for sustaining the environment are addressed more directly mainly under goals 5 and 8.

42. There are significant differences between the status and trends of, and threats to, fisheries in marine and coastal *versus* inland water environments. Chief amongst these is that environmental degradation is the major threat inland, whereas over-exploitation is the main threat to the major marine fisheries. "Managed on the basis of sustainability" is very difficult to define for inland water ecosystem biological diversity because the two major problems of environmental degradation, and habitat loss, and over-exploitation are inter-dependent. The pattern of exploitation is also significantly different (the bulk of the marine catch is taken by large-scale intensive/commercial operations, whereas inland waters are exploited mainly by small scale operations with high levels of participation by indigenous and local communities). Therefore, management options differ significantly between the two. Comparisons between marine and inland fisheries should bear in mind these and other differences.

43. For inland waters, "products" should include all related benefits derived from inland water fisheries (etc.) and not be limited to products which are directly consumed (for example, including recreational fisheries).

3/ UNEP/CBD/SBSTTA/9/9 and relevant information documents.

4/ The term "sustainably managed" is understood to mean "managed for sustainability" – that is the management objective is that the biodiversity or resources themselves are sustained (not that management itself is sustained).

44. The main biodiversity effects of aquaculture include habitat degradation, disruption of trophic systems, depletion of natural seedstock, transmission of diseases, and reduction of genetic variability. Pollutants, such as chemicals and drugs can also be detrimental to the aquatic ecosystem, while the need to feed cultured carnivorous fish protein caught from the wild leads to net loss of biodiversity, unless alternative feed sources are used. Inland waters are the main source of world aquaculture production and therefore achieving the target for this sector is a major priority. However, targets, indicators and management options are complicated by the difficulties of definitions and their application in practice – particularly as a large percentage of the production arises from mixed culture-capture activities (e.g., stock enhancement of large water bodies).

45. The FAO Code of Conduct for Responsible Fisheries is a good basis for management for sustainability of fisheries. A quantitative process-oriented target could be set based upon number of Parties or ecosystems where that code is effectively implemented. The FAO Code of Conduct for Responsible Fisheries also provides principles and criteria for recognizing sustainable fisheries which are elaborated further under this target for marine and coastal biological diversity (UNEP/CBD/SBSTTA/10/8/Add.1).

46. Article 9 of the Code of Conduct for Responsible Fisheries of the Food and Agriculture Organization provides a set of voluntary principles and standards that, if applied, ensure that potential social and environmental problems associated with aquaculture development are duly addressed and that aquaculture develops in a sustainable manner. Effective site selection, including keeping some areas free of aquaculture in the context of integrated area management approaches, is an important precautionary measure. Management plans and measures will need to be applied to the transfer and management of broodstock, and the introduction of invasive genotypes into the environment, to prevent potential impacts on genetic diversity. This target acknowledges the contribution of aquaculture to food security while seeking to ensure that aquaculture operations are undertaken in a sustainable manner.

47. The two sub-targets (4.1.1 and 4.1.2) are effectively 100 per cent targets. The rationale for this includes: (i) that the overall target refers to a 100 per cent target by 2010, and therefore a lower target for inland waters is not justified; and (ii) because of the difficulties in ascertaining which fisheries or aquaculture activities are sustainable, compounded by very poor data for inland fisheries and overlaps between culture and capture, the only credible target is zero or 100 per cent (since any figure in between requires the status of all fisheries/aquaculture to be known, but the 100 per cent target can be assessed on the basis of whether existing data support it).

48. Indicators for this will be difficult to identify, partly due to the unreliability of FAO Fisheries Statistics for inland waters, compared with the data for marine fisheries. Indicators for aquaculture may be more forthcoming, particularly if the private sector extensively adopts product certification.

Overall Target 4.2: Unsustainable consumption of biological resources, or that impacts upon biodiversity, reduced.

49. This target is regarded as being technically the same as target 4.1. The criterion for unsustainable consumption is unsustainable production. It is however noted that drawing attention to the need to moderate consumption is desirable in terms of public awareness raising.

Overall Target 4.3: No species of wild flora or fauna endangered by international trade.

Application of target to inland water ecosystem biological diversity: *No species of wild flora or fauna dependent upon inland water ecosystems endangered by international trade.*

Technical rationale

50. This target applies directly without qualification or change.

51. Trade in inland water species continues to increase and includes food trade, ornamental trade (for example aquarium fish and plants), and curio trade (for example skins and shells). A large variety of animals, and some plants, is included in this trade and especially fish, reptiles (particularly crocodiles and turtles) and amphibians (especially frogs). Unsustainable trade may have a number of biodiversity effects

resulting from destructive collection practices, the introduction of alien species, and over-harvesting. These include the threat of extinction. However, sustainable trade brings significant benefits to indigenous and local communities in predominately rural, low-income areas.

52. The fisheries and aquaculture activities that supply such trade would be managed using the same criteria for other types of fisheries and aquaculture (see target 4.1). The Convention on International Trade of Endangered Species of Fauna and Flora (CITES) is an important international mechanism for regulating trade, and provides a way for importing countries, which are often creating the demand for products, to share responsibility with the source countries for ensuring that trade is sustainable.

53. A potential indicator for this exists with the data for CITES listed species.

C. Address threats to biodiversity

Goal 5. Pressures from habitat loss, land-use change and degradation, and unsustainable water use, reduced

Overall Target 5.1: Rate of loss and degradation of natural habitats decreased.

Application of the target to inland water ecosystem biological diversity: *Rate of loss and degradation of inland water ecosystem habitats, especially through unsustainable water use, are decreased.*

Technical rationale

54. Unsustainable water use is a critically and increasingly important issue for the maintenance of inland water ecosystems. An integrated management approach is essential, and is in line with the WSSD Plan of Implementation, amongst others. The critical role that freshwater plays in underpinning sustainable development has been well established by the Millennium Assessment.

55. Pressures on inland water ecosystems from pollution, habitat loss, land-use change and degradation, and unsustainable water use often originate from activities not wholly within the purview of the inland waters programme of work, including forestry, mining, agriculture, industry, etc. It is imperative that all relevant programmes of work, particularly forest, mountain, grassland, and arid ecosystems, consider adverse impacts on inland water ecosystems and include steps to reduce and mitigate those impacts. This is consistent with decision VII/4, paragraph 11 of the Conference of the Parties, which encourages Parties, other Governments and organizations to ensure cross-referencing to, and coherence with, the other thematic programmes of work while implementing the programme of work on the biological diversity of inland water ecosystems.

56. It is critical to include specific reference to "unsustainable" use of water under this target (consistent with the goal). Water use is a major driver of change to both ecosystem quality and quantity. Direct attention to water as a major area of concern also helps align the Programme of Work better with similar concerns in related initiatives (for example, both the WSSD and the MDGs refer specifically to the need to improve water policies and management). Quantitative sub-targets may be feasibly set for water quality and quantity.

57. The increasingly used Index of Biotic Integrity (IBI) can be examined for possible immediate application as an indicator for this target, at least for some example areas/countries/regions. Also, the United Kingdom Freshwater Biological Association is establishing a Freshwater Life database, which may be able to contribute in a similar manner to UNEP-GEMS Water for water quality. "Water quality" (freshwaters) is currently being explored as an indicator for the "overall targets" (UNEP/CBD/SBSTTA/10/9). The indicator will also explore using "water quantity" (i.e., levels of water extractions etc.) as a complimentary indicator.

Goal 6. Control threats from invasive alien species

Overall Target 6.1: Pathways for major potential invasive alien species controlled.

Application of the target to inland water ecosystem biological diversity: *Pathways for major potential invasive alien species in inland water ecosystems controlled.*

Technical rationale

58. This target can be applied to inland water ecosystem biological diversity directly.

59. The control of pathways is regarded as the most effective way to address the problem of invasive alien species in inland water ecosystems. The main sources of introductions include deliberate releases or escapes from aquaculture and related fisheries activities and inter-basin water transfers.

60. Pathways need to be identified, evaluated and managed to reduce risk of invasion using best practices. Significant advances have been made in management of ballast water, and the rapid entry into force and effective implementation of the International Convention on the Control and Management of Ships' Ballast Water and Sediments by IMO member States is a priority activity to reach this target. This target is also related to target 3.1 because accidental introduction of cultured organisms may have an impact on genetic diversity of wild species.

61. There is some evidence that inland water ecosystems are particularly vulnerable to the impacts of invasive alien species in that the likelihoods of establishment and significant socio-economic impacts are high. Inland water ecosystems are also faced with potentially increased risks due to the rapidly expanding aquaculture sector – but this has not been systematically assessed relative to other ecosystems.

62. The requirements for inland water ecosystem biodiversity are considered little different to those for most other ecosystems. The relevant pathways are also similar, although there may be differences in the relative importance of the various potential pathways. One consideration for inland water ecosystem biological diversity is that many alien species, once introduced, are very difficult to subsequently manage (particularly for submerged taxa such as fish and invertebrates). In effect this means that priority should be given to preventing introduction by controlling pathways.

63. Potential indicators for some taxa are available through the FAO Database on Invasive Alien Species (DIAS) and related data kept in FISHBASE.

Overall Target 6.2: Management plans in place for major alien species that threaten ecosystems, habitats or species.

Application of the target to inland water ecosystem biological diversity: *Management plans in place for major alien species that threaten inland water ecosystems, habitats or species.*

Technical rationale

64. This target can be applied directly to the programme of work on inland water ecosystem biological diversity.

65. Despite improved control of pathways (target 6.1), invasive alien species still pose significant threats to inland water ecosystems. The development and implementation of management plans (covering prevention, containment, eradication and control) is an important priority. Further rationale for this target, and required activities, is provided for the same target for marine and coastal biodiversity (UNEP/CBD/SBSTTA/8/Add.1).

66. The target for plants (UNEP/CBD/COP/7/20/Add.3) is quantified "...for at least 100 major alien species....". Such a quantified target has not been proposed for inland water biological diversity since it is considered: (i) that there are very many more than the 100 potential target alien species, including a large number of plants (but the number is not currently assessed), and (ii) in theory, "management plans" should be in place for all major alien species.

67. Potential indicators for some taxa are available through the FAO Database on Invasive Alien Species (DIAS) and related data kept in FISHBASE.

Goal 7. Address challenges to biodiversity from climate change and pollution

Overall Target 7.1: Maintain and enhance resilience of the components of biodiversity to adapt to climate change.

Application of the target to inland water ecosystem biological diversity: *Maintain and enhance resilience of the components of inland water ecosystem biodiversity to adapt to climate change.*

Technical rationale

68. This target can be applied directly to the programme of work on inland water ecosystem biological diversity.

69. Ecosystems and species that are healthy have an improved capacity to both resist and recover from periodic disturbances, such as extreme droughts and floods. This target seeks to maintain ecosystem resistance and resilience to climate change through controlling and minimizing other major human-induced impacts on inland water ecosystems.

70. Relevant activities include the application of sound management practices in an ecosystem context. Representative networks of inland water protected areas, together with improved catchment management, should be designed to offer resilience in the face of climate-induced threats. A particularly important aspect of this target is the need to maintain corridors (pathways) for the movement of migratory species.

71. An important feature of inland water ecosystems is the ability of relatively intact systems to mitigate the impacts of climate change. For example, intact, unregulated river basins, which maintain floodplain connectivity, contribute significantly to mitigating the impacts of catastrophic flooding. Similarly intact wetlands along the coast mitigate against the impact of cyclones. These aspects are covered more directly under goal 8.1.

Overall Target 7.2: Reduce pollution and its impacts on biodiversity.

Application of target to inland water ecosystem biological diversity: *Reduce pollution and its impacts on inland water ecosystem biodiversity.*

Technical rationale

72. This target applies directly to inland water ecosystem biological diversity.

73. Land-based activities are a major source of threats to the resilience, productivity and biodiversity of inland water ecosystems. Threats from land-based activities include pollution from municipal, industrial and agricultural wastes and run-off, as well as atmospheric deposition. For the present purposes, "pollution" includes eutrophication (particularly increases in dissolved nitrogen and phosphorus), acidification and sedimentation. Pollution sources may also be diffuse or point. The reduction below natural levels of compounds (e.g., nutrients or sediments) can also be problematic.

74. The problems of pollution are largely brought about by unsustainable activities on land. This points to the need to ensure adequate attention to the requirements of inland water ecosystem biological diversity throughout all goals and targets as applied to other thematic areas. That is, this target (as well as some others) cannot be addressed through the programme of work on inland water ecosystem biological diversity alone. Inland water ecosystems probably present the strongest case for the effective application of the ecosystems approach. Most of the pollution entering marine and coastal ecosystems (see UNEP/CBD/SBSTTA/10/8/Add.1) enters those environments from inland waters. Solving marine pollution largely centres on solving pollution problems for inland waters.

75. This target refers specifically to "water quality". Water quality is already identified as an indicator of progress towards the overall target (UNEP/CBD/SBSTTA/10/9). Water bird population trends are a potential indicator. Some species, for example, are known to become more abundant in eutrophic wetlands.

C. Maintain goods and services from biodiversity to support human well-being

Goal 8. Maintain capacity of ecosystems to deliver goods and services and support livelihoods

Overall Target 8.1: Capacity of ecosystems to deliver goods and services maintained.

Application of target to inland water ecosystem biological diversity: *Capacity of inland water ecosystems to deliver goods and services maintained.*

Technical rationale

76. This target applies directly to inland water ecosystem biological diversity.

77. This target is recognized as overarching Vision for the Programme of Work on the biological diversity of inland water ecosystems (see UNEP/CBD/SBSTTA/10/8).

78. This target can be seen as an application of the target set forward in paragraph 29 (d) of the Plan of Implementation of the World Summit on Sustainable Development, which encourages the application of the ecosystem approach by the year 2010. Management of inland water ecosystems (including land based activities which affect them) at the ecosystem scale can best maintain ecosystem capacity to deliver goods and services. The Millennium Assessment (MA), and its synthesis reports for the Ramsar Convention and for the Convention on Biological Diversity, stress that this is the critically important and essential approach if human well-being and poverty reduction is to be delivered in the future. They stress the major importance and high value of wetland ecosystem services, and particularly provisioning, cultural and regulation services, and that conversion of naturally-functioning wetlands to other uses greatly reduces their long-term value, for often only short-term and lesser sectoral gain.

79. Consideration of indicators for this target should bear in mind that progress towards achieving all the other targets (using indicators for those) is an indicator of progress towards achieving this target. An important service provided by inland water ecosystems is to mitigate against the impacts of climate change (e.g., intact river systems mitigate against catastrophic floods). This provides an important link to targets relating to climate change (target 7.1). A very useful indicator for this is the frequency and severity (costs) of catastrophic climatic events (as tracked, for example, by flood insurance premiums).

Overall Target 8.2: Biological resources, that support sustainable livelihoods, local food security and health care, especially of poor people, maintained.

Application of target to inland water ecosystem biological diversity: *inland water biological resources, that support sustainable livelihoods, local food security and health care, especially of poor people, maintained.*

Technical rationale

80. This target applies directly to inland water ecosystem biological diversity.

81. Livelihoods dependency on the biological diversity of inland water ecosystems can be very high, especially for the rural poor in developing countries. The review of the status and trends of biological diversity of inland water ecosystems (CBD Technical Series number 11) also indicates that these resources are in rapid decline globally. Sustainable use of such resources can directly contribute to poverty alleviation, and can be in conformity with the Millennium Development Goals (MDGs). Inland water biological diversity contributes to livelihoods through subsistence, artisanal, traditional, customary, and commercial fishing and harvesting (for food or for construction, pharmaceutical and other materials). In addition, non-extractive activities, such as tourism, recreational fishing and aquaculture, enhance livelihoods when undertaken in a sustainable manner. Globally, the bulk of the people engaged in inland fisheries are poor and many are without alternative livelihood options. The maintenance of healthy inland water ecosystems is therefore directly linked to the well-being of inland communities.

82. “Sustaining livelihoods” is a complex concept for inland water ecosystem biological diversity, in particular because the water itself can be used in a number of potentially conflicting ways to “improve” livelihoods of different communities or interest groups. Nevertheless, increased attention needs to be given to the livelihoods of people who currently depend directly upon biological resources derived from inland water ecosystems. For example, if not properly and carefully implemented, water management activities can re-allocate the benefits of water resources from existing to new users, with a net loss in socio-economic value. This is invariably accompanied by a loss of the livelihoods benefits of biodiversity and the undermining of the sustainability of biodiversity at the local level.

83. The rationales for targets under goals 1, 2, 4, 5, 7 and 8.1 include activities to reach this target. Sustainability of local livelihoods and biodiversity are linked to local consumption of local products. Incorporating information relevant to local livelihoods into valuations of inland water ecosystems could help guide overall decisions concerning advantages of keeping the benefits of biodiversity at the local level, as opposed to, for example, favouring initiatives that may be positive to the economy but not necessarily to the quality of life of local people. The Ramsar STRP is currently producing guidelines for undertaking such valuations.

84. This target is also related to the targets under goals 9 and 10.

85. Indicators for this target will be problematic. Indicators exist for the status and trends in he biodiversity (see for example goals 1 and 2) but data for livelihoods dependency are less readily available. The FAO fisheries statistics, as currently compiled, are not only unreliable but misleading for such analyses.

E. Protect traditional knowledge, innovations and practices

Goal 9. Maintain socio-cultural diversity of indigenous and local communities

Overall Target 9.1: Protect traditional knowledge, innovations and practices.

Application of target to inland water ecosystem biological diversity: *Protect traditional knowledge, innovations and practices associated with the biological diversity of inland water ecosystems.*

Overall Target 9.2: Protect the rights of indigenous and local communities over their traditional knowledge, innovations and practices, including their rights to benefit-sharing.

Application of target to inland water ecosystem biological diversity: *Protect the rights of indigenous and local communities over their traditional knowledge, innovations and practices, including their rights to benefit-sharing, regarding the biological diversity of inland water ecosystems.*

Combined technical rationale for targets 9.1 and 9.2

86. These targets apply directly to inland water ecosystem biological diversity.

87. Indigenous, traditional and local communities have a wealth of knowledge about biodiversity and its sustainable management, and in many countries the biodiversity of inland water ecosystems underpins livelihoods and food security. Application of sustainable local and traditional knowledge in the management of biological resources may also promote the maintenance of local and traditional knowledge systems. This target is consistent with target 9 of the Millennium Development Goals (to integrate principles of sustainable development into country policies and programmes and to reverse the loss of environmental resources) and Agenda 21.

88. Measures to address the decline in associated indigenous and local knowledge should be implemented consistent with the Convention's programme of work on Article 8(j) and related provisions. Fair and equitable sharing of benefits also plays a potentially important role in poverty eradication and environmental sustainability, consistent with the goals and targets of the Millennium Development Goals. World-wide experience has shown that local and indigenous communities must be empowered to ensure that their knowledge is applied in policy development and management. Traditional knowledge, particularly oral knowledge, on practices such as the use of traditional fishing gear, is easily lost, and documenting local knowledge is important for its protection. Access to information helps enable indigenous and local communities to participate in biodiversity management processes. In addition, communities should be guaranteed the right of access to resources upon which they depend.

89. In terms of indicators, it is unlikely that the issues and requirements are different in inland waters than any other ecosystem. Reliable indicators for this target will be difficult to find. The AHTEG on indicators has already referred the matter to the Ad Hoc Open Ended Working Group on Article 8(j) and related provisions (see UNEP/CBD/SBSTTA/10/9).

F. Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources

Goal 10. Ensure the fair and equitable sharing of benefits arising out of the use of genetic resources

Overall Target 10.1: All transfers of genetic resources are in line with the Convention on Biological Diversity, the International Treaty on Plant Genetic Resources for Food and Agriculture and other applicable agreements.

Application of target to inland water ecosystem biological diversity: *All transfers of genetic resources derived from inland water ecosystems are in line with the Convention on Biological Diversity, the International Treaty on Plant Genetic Resources for Food and Agriculture and other applicable agreements.*

Overall Target 10.2: Benefits arising from the commercial and other utilization of genetic resources shared with the countries providing such resources.

Application of target to inland water ecosystem biological diversity: *Benefits arising from the commercial and other utilization of genetic resources derived from inland water ecosystems shared with the countries providing such resources.*

Combined technical rationale for targets 10.1 and 10.2:

90. These targets apply directly without modification.

91. Knowledge of the potential value of the genetic resources of inland water ecosystems is very poor but there is no reason to suggest it is less than for other ecosystems. Examples of the benefits derived from genetic resource transfer are already well established and include that most aquaculture production globally, the bulk of which comes from inland waters, is based upon the use of alien species or genotypes (and therefore has been transferred).

92. In order to assist Parties, Governments and relevant stakeholders with the implementation of the access and benefit-sharing provisions of the Convention, the Conference of the Parties adopted at its sixth meeting the Bonn Guidelines on Access to Genetic Resources and the Fair and Equitable Sharing of the Benefits arising from their Utilization. These voluntary guidelines are meant to assist Parties and relevant stakeholders when establishing legislative, administrative and policy measures on access to genetic resources and benefit-sharing and/or when negotiating contractual arrangements for access and benefit sharing. Additionally, in accordance with decision VII/19, an international regime on access and benefit sharing is to be negotiated by the Ad Hoc Open-ended Working Group on Access and Benefit-Sharing. Against this background, this target aims to ensure that national systems established to implement the access and benefit-sharing provisions of the Convention also cover access to inland water genetic resources and the fair and equitable sharing of benefits arising out of the utilization of these resources, in accordance with the Convention.

93. Indicators for this will be developed as for those for the overall targets (UNEP/CBD/SBSTTA/10/9). Consideration should be given to disaggregating data for inland water genetic resources.

G. Ensure provision of adequate resources

Goal 11. Parties have improved financial, human, scientific, technical and technological capacity to implement the Convention.

Overall Target 11.1: New and additional financial resources are transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with Article 20.

Application of target to inland water ecosystem biological diversity*: New and additional financial resources are transferred to developing country Parties, to allow for the effective implementation of their commitments for the programme of work on the biological diversity of inland water ecosystems under the Convention, in accordance with Article 20.*

Overall Target 11.2: Technology is transferred to developing country Parties, to allow for the effective implementation of their commitments under the Convention, in accordance with its Article 20, paragraph 4.

Application of target to inland water ecosystem biological diversity: *Technology is transferred to developing country Parties, to allow for the effective implementation of their commitments for the programme of work on the biological diversity of inland water ecosystems under the Convention, in accordance with its Article 20, paragraph 4.*

Combined technical rationale for targets 11.1 and 11.2

94. These targets apply directly without modification.

95. The lack of financial resources, capacity, and sustainable technological resources are consistently cited by Parties as the main impediments for the effective implementation of the Convention and its provisions. In addition, development of improved economic instruments and social institutions is needed. The effective implementation of actions to reach these targets will require the availability of new financial and technological resources, as well as capacity-building. In addition, best use should be made of existing resources in both developing and developed countries, and developed countries may also need to refocus additional resources towards the conservation and sustainable use of biodiversity. Transfer of knowledge is an important component of this target and may occur both from developed countries to developing countries, and *vice versa*. Increased communication and the formation of partnerships and regional networks are vital for the achievement of these targets, as are education, public awareness and access to information.

96. There is increasing confirmation, including from the Millennium Ecosystem Assessment (MA) that inland water ecosystems and the services they provide for human well-being and poverty reduction are being seriously compromised by over-exploitation, and that the quantity and quality of the ecosystem resource is deteriorating even more rapidly that are other terrestrial ecosystems. There is therefore a case for urging particular attention to securing further resources to reduce the rate of loss of these critically important ecosystems. To address this, the Programme of Work on the biological diversity of inland water ecosystems recognizes the need for a focus on capacity-building for ecosystem-based, basin-scale, management approaches (e.g. IRBM). This should be achieved, for example, through spatial planning and integrated water resource management mechanisms, working through and with sectors such as agriculture and forestry developments so as to improve efficiency of water use and the maintenance of environmental flows to inland waters, as the basis of securing their continuing role in maintaining the hydrological cycle.

97. Indicators for this target will be developed as for those for the overall targets (UNEP/CBD/SBSTTA/10/9). Consideration should be given to disaggregating data for inland water resources.

98. The language of the goal clearly states the intent to improve the capacity of developing country parties to effectively implement their commitments under the Convention. The targets refer only to the transfer of financial and technical resources from developed to developing countries. However, the goal also implies efforts to increase internal capacity of developing countries through training and development of financial mechanisms such as user fees and payment-for-environmental-services schemes that will provide internal financial resources for inland water ecosystem management. Attention to the need to develop internal capacity (using national resources) is given in the Strategic Plan of the Convention.
