



**Plenary of the Intergovernmental Science-Policy
Platform on Biodiversity and Ecosystem Services
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Item 5 of the provisional agenda*

**Report of the Executive Secretary on the implementation
of the work programme for the period 2014–2018**

**Update on the classification of nature’s contributions to people
by the Intergovernmental Science-Policy Platform on
Biodiversity and Ecosystem Services**

Note by the secretariat

1. By its decision IPBES-2/4, the Plenary of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) adopted a conceptual framework for the Platform, set out in the annex to that decision, that includes six interlinked elements.
2. The annex in the present note focuses on the element called “nature’s benefits to people”. It sets out a classification of those benefits, renamed “nature’s contributions to people” (see annex, para. 2), developed by the Multidisciplinary Expert Panel in collaboration with experts involved in the regional and global assessments and the IPBES task forces. It also provides a rationale for the classification and for how it has conceptually evolved from the ecosystem services classification used by the Millennium Ecosystem Assessment (2005).
3. The classification set out in the annex is proposed as a means for reporting consistently on ongoing and future assessments of IPBES. It is recommended for use in the regional assessments and will be used in the global assessment. The annex is presented without formal editing.

* IPBES/5/1/Rev.1.

Annex

Update on the classification of Nature's Contributions to People by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services

I. Developing the IPBES classification of Nature's Contributions to People (NCP)

1. This classification has been developed by members of the Multidisciplinary Expert Panel (MEP), in collaboration with experts of the regional and of the global assessments and the IPBES task forces. This group is preparing a longer scientific publication, from which the substantial text of this document is taken, and which will provide additional rationale for the classification, and a more detailed presentation of the categories, including a glossary of key terms.
2. The MEP at its 8th meeting (October 2016) decided to rename Nature's Benefits to People to Nature's Contributions to People for two main reasons: 1) The word "benefits", with its strongly positive connotation, wrongly conveyed the idea that negative contributions from nature towards peoples' good quality of life would be excluded; 2) The different meanings of the word "benefits" in common speech in different languages as well as in the social sciences and the valuation literature represented potential sources of confusion. It was therefore proposed that the name Nature's Benefits to People would be changed to Nature's Contributions to People (NCP), while retaining exactly the same meaning and conceptualization as in Díaz et al. (2015a, b), in accordance with the IPBES conceptual framework.
3. This classification has been sent to all authors from the regional assessments with a recommendation to use it. This use will however be left to the capacity of authors, given the fact that it arrives at an advanced stage of development of the regional assessment drafts. It is however expected that this classification will be used by the global assessment, and by any future assessment to be decided by the Plenary.
4. It should be noted that some adjustments may be made to this classification for two reasons: (i) while the current system allows experts to report on indigenous and local knowledge to some degree, some further thinking is being done to better accommodate this aspect (see para 11); (ii) as feedback is received from experts using this classification, adjustments might be necessary. It is however not envisaged to modify the overall list of 18 NCP.

II. From Ecosystem Services to Nature's Contributions to People

5. The second session of the Plenary approved as the first product of the Platform, the IPBES Conceptual Framework (Díaz et al 2015a,b¹; Figure 1). This conceptual framework identifies six major elements in the interaction between human societies and the non-human world: *nature, nature's benefits to people, a good quality of life, anthropogenic assets, direct drivers of changes in nature, and institutions, governance and other indirect drivers*. IPBES assessments require reporting according to these broad categories (indicated by six boxes in Figure 1), and major interactions among them (indicated by arrows 1-8 in Figure 1). This note focuses on one of these major elements, *nature's benefits to people*, now renamed *nature's contributions to people* (see above).
6. *Nature's contributions to people* represent an inclusive category across knowledge systems that emerged from a thorough multi-stakeholder consultative process. It includes all the contributions, both positive and negative, of nature to the quality of life of humans as individuals, societies or humanity as a whole.
7. The classification of Nature's Contributions to People, presented in sections III and IV, is strongly rooted in the ecosystem services classification used by the Millennium Ecosystem Assessment (MA). The MA classification was comprised of four categories of ecosystem services: supporting, regulating, provisioning and cultural. The changes reflect a conceptual evolution based on

¹ Díaz S, Demissew S, Joly C, Lonsdale W, Ash N, Larigauderie A, 2015a: The IPBES Conceptual Framework - connecting nature and people. *Current Opinion in Environmental Sustainability* 14:1-16.
Díaz et al. 2015b. A Rosetta Stone for Nature's Benefits to People. *PLOS Biology* 13: 1.

more than a decade of interdisciplinary thinking, with increasing involvement from the social sciences and humanities. Major characteristics, and differences compared to the MA are summarised below.

(a) IPBES considers all contributions of nature to the quality of life of humans as NCP, irrespective of how much human input is embedded in them through co-production.

(b) The supporting services of the Millennium Assessment (e.g. nutrient cycling, production of atmospheric oxygen) are now widely considered as an ecosystem property and have therefore been included in the conceptual framework as part of the “nature” element, and not as a category of NCP, to be consistent with the IPBES conceptual framework.

(c) The classification places a major emphasis on the fact that the cultural context influences the perception and experiences by people of NCP, and stresses the importance of socio-cultural relations between people and nature. Indeed, culture permeates not only NCP, but also all elements of the IPBES conceptual framework. To reflect this important dimension in the classification, cultural ecosystem services are no longer a separate category (thus departing from the MA) and the role of culture has been elevated by including sub-categories in each of the three main groups presented below.

III. The three groups of Nature’s Contributions to People

8. The classification distinguishes three broad groups of NCP: regulating, material and non-material. These represent different facets of the complex flow from nature to a good quality of life (Arrows 4 and 8 in Fig. 1), ranging from indispensable direct biological connections (e.g. oxygen, water), to symbolic components that give meaning to the identity of different social groups and their relationships with nature.

(a) **Regulating contributions** – Functional and structural aspects of organisms and ecosystems that modify environmental conditions experienced by people, and/or sustain and/or regulate the generation of material and non-material benefits. These NCP include, for example, water purification, climate regulation, or soil erosion regulation. They are often not experienced directly by people. Regulating ecosystem services, as defined in the Millennium Ecosystem Assessment, largely fit within this category.

(b) **Material contributions** – Substances, objects or other material elements from nature that sustain people’s physical existence and infrastructure (i.e the basic physical and organizational structures and facilities, such as buildings, roads, power supplies) needed for the operation of a society or enterprise). They are typically physically consumed in the process of being experienced, such as when plants or animals are transformed into food, energy, or materials for shelter or ornamental purposes. Provisioning ecosystem services, as defined in the Millennium Ecosystem Assessment largely fit within this category.

(c) **Non-material contributions** – Nature’s contribution to people’s subjective or psychological quality of life, individually and collectively. The entities that provide these intangible contributions can be physically consumed in the process (e.g. animals in recreational or ritual fishing or hunting) or not (e.g. individual trees or ecosystems as sources of inspiration). Many cultural ecosystem services as defined in the Millennium Ecosystem Assessment fit within this category, while some cultural ecosystem services are now considered part of “values” or a “good quality of life”.

IV. The categories of Nature’s Contributions to People

9. A set of 18 specific categories of nature’s contributions to people are presented in Table 1. Information about the status of all of them might not be available for all the regions of the world or IPBES regional units of analysis. Some of them can also be further disaggregated or lumped together according to the goal of the assessment and the availability of data and information (for example pest and disease regulation can be disaggregated into regulation of agricultural pests and regulation of human disease).

10. This classification, importantly, recognises that many NCP do not fit squarely within just one of the three broad groups of non-material, material or regulating NCP described above. Some of these categories of NCP are fully contained within a given group. For example, the buffering effect of photosynthetic organisms on ocean water acidity is fully contained within the regulating NCP. But many other categories of NCP, however, span multiple groups. For example, food can be placed within the material NCP group for its nutritional aspect, but it also has important implications for people’s cultural identity and social bonding, and thus can also be seen as a non-material NCP contributing to a good quality of life.

11. In accordance with the IPBES mandate to embrace multiple knowledge systems, the three broad groups (regulating, material, and non-material) and the specific 18 categories presented in Table 1 may be approached from different knowledge system perspectives:

- (i) Western science emphasizes the need for disaggregated NCP categories which represent mainly unidirectional flows (from nature to people, both seen as separate entities). The proposed set of 18 specific NCP categories pertain to this perspective and are generally closely associated with the concept of ‘ecosystem services’.
- (ii) Other knowledge systems, notably those of many indigenous peoples (and relational approaches in environmental-social sciences and humanities) conceive the linkages between nature and people with less starkly defined boundaries between them. Therefore, the level of disaggregation of NCP categories presented in Table 1 is not always compatible with these approaches. The IPBES conceptual framework recognizes this broader understanding of NCP through the term ‘nature’s gifts’ (see Figure 1). This broader perspective, which is an emerging theme in the science-policy interface on biodiversity, ecosystems, and society, precludes a clearcut disaggregation of NCP categories as shown in Table 1. Therefore, further thinking is underway regarding the conceptual and methodological specifics of this perspective on NCP and its inclusion in the on-going and future IPBES assessments. In the meantime, some complementary over-arching NCP categories associated with the three broad groups (regulating, material and non-material NCP), amenable to be used in assessments, are being considered. Such over-arching categories are broader than (not as specific as) the NCP identified in Table 1. This way, a conceptually sound and empirically consistent complementarity would be achieved with respect to the 18 specific NCP.

Figure 1
The IPBES Conceptual Framework.

Boxes and arrows represent the elements of nature and society that are at the main focus of IPBES. In each of the boxes, the headlines in bold are inclusive categories of relevance to all stakeholders of IPBES and embrace the categories of western science (in green) and equivalent or similar categories according to other knowledge systems (in blue). The blue and green categories mentioned here are illustrative and not exhaustive. Solid arrows in the main panel denote influence between elements; the dotted arrows denote links that are acknowledged as important, but are not the main focus of the Platform. The box (nature’s contributions to people) and arrows (4-8) in sharper black are the focus of the present note. This figure is reproduced (with the modification of the original name nature’s benefits to people into nature’s contributions to people) from Díaz et al. 2015a, b, representing a simplified version of that adopted by the second session of the Plenary of IPBES (IPBES/2/17).

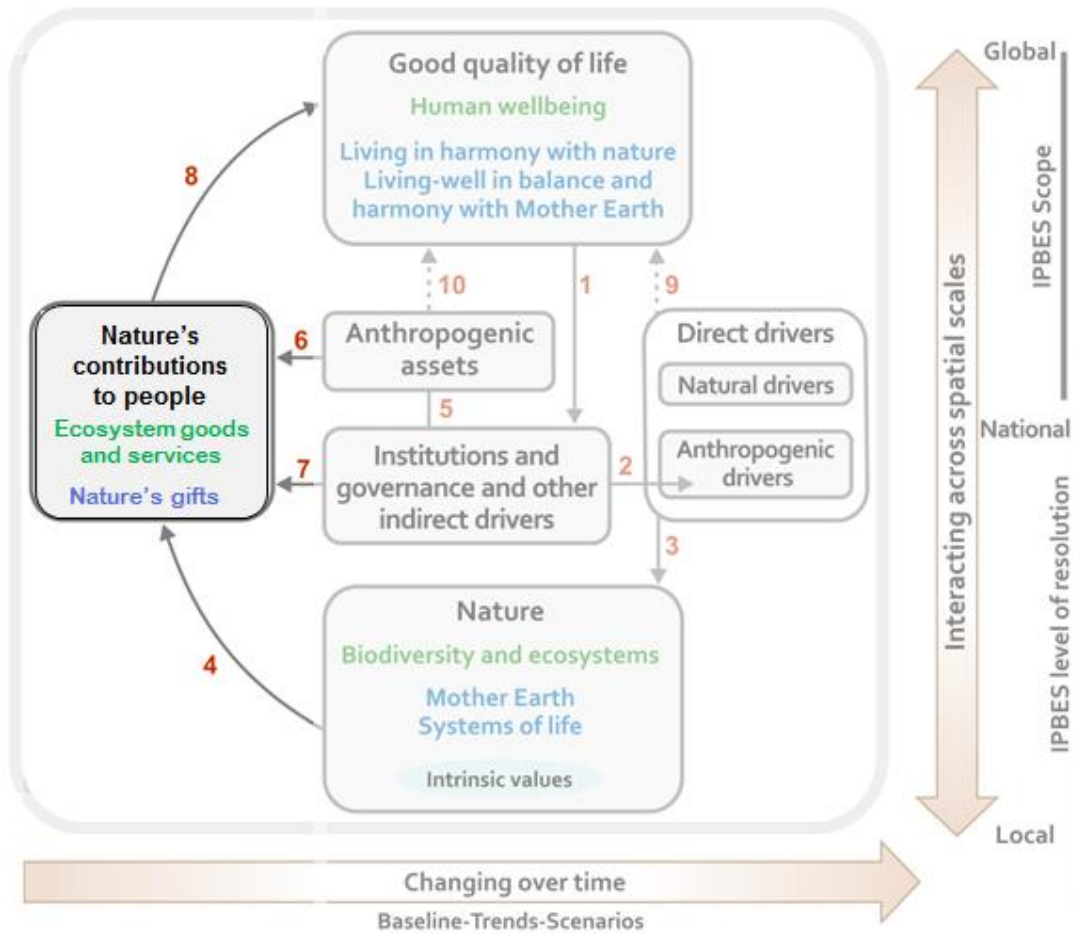


Table 1
The 18 specific categories of nature's contributions to people (NCP) used in IPBES on-going assessments:

Reporting categories of nature's contributions to people	Brief explanation and some examples
1 Habitat creation and maintenance	<ul style="list-style-type: none"> • Formation and continued production, by ecosystems or organisms within them, of ecological conditions necessary or favourable for organisms important to humans, e.g. nesting, feeding, and mating sites for birds and mammals, resting and overwintering areas for migratory mammals, birds and butterflies, nurseries for juvenile stages of fish
2 Pollination and dispersal of seeds and other propagules	<ul style="list-style-type: none"> • Facilitation by animals of movement of pollen among flowers, and dispersal of seeds, larvae or spores of organisms important to humans
3 Regulation of air quality	<ul style="list-style-type: none"> • Regulation (by impediment or facilitation) by ecosystems, of CO₂/O₂ balance, O₃ for UV-B absorption, levels of sulphur oxide, nitrogen oxides (NO_x), volatile organic compounds (VOC), particulates, aerosols • Filtration, fixation, degradation or storage of pollutants that directly affect human health or infrastructure
4 Regulation of climate	<p>Climate regulation by ecosystems (including regulation of global warming) through:</p> <ul style="list-style-type: none"> • Positive or negative effects on emissions of greenhouse gases (e.g. biological carbon storage and sequestration; methane emissions from wetlands) • Positive or negative effects on biophysical feedbacks from vegetation cover to atmosphere, such as those involving albedo, surface roughness, long-wave radiation, evapotranspiration (including moisture-recycling) • Direct and indirect processes involving biogenic volatile organic compounds (BVOC) • Regulation of aerosols and aerosol precursors
5 Regulation of ocean acidification	<ul style="list-style-type: none"> • Regulation, by photosynthetic organisms (on land or in water), of atmospheric CO₂ concentrations and seawater pH, which affect associated calcification processes by many marine organisms important to humans (such as corals)
6 Regulation of freshwater quantity, location and timing ²	<ul style="list-style-type: none"> • Regulation, by ecosystems, of the quantity, location and timing of the flow of surface and groundwater used for drinking, irrigation, transport, hydropower, and as the support of non-material contributions (NCP 15, 16, 17) • Regulation of flow to water-dependent natural habitats that in turn positively or negatively affect people downstream, including via flooding (wetlands including ponds, rivers, lakes, swamps) • Modification of groundwater levels, which can ameliorate dryland salinization in irrigated landscapes
7 Regulation of freshwater and coastal water quality	<ul style="list-style-type: none"> • Regulation – through filtration of particles, pathogens, excess nutrients, and other chemicals – by ecosystems or particular organisms, of the quality of water used directly (e.g. drinking) or indirectly (e.g. aquatic foods, irrigated food and fibre crops, freshwater and coastal habitats of heritage value)
8 Formation, protection and decontamination of soils and sediments	<ul style="list-style-type: none"> • Sediment retention and erosion control, soil formation and maintenance of soil structure and processes (such as decomposition and nutrient cycling) that underlie the continued fertility of soils important to humans. • Filtration, fixation, degradation or storage of chemical and biological pollutants (pathogens, toxics, excess nutrients) in soils and sediments that are important to humans
9 Regulation of hazards and extreme events	<ul style="list-style-type: none"> • Amelioration, by ecosystems, of the impacts on humans or their infrastructure caused by e.g. floods, wind, storms, hurricanes, seawater intrusion, tidal waves, heat waves, tsunamis, high noise levels • Reduction, by ecosystems, of hazards like landslides, avalanches

² Hydrological NCP are fundamentally conceived as regulating NCP, because the primary impact of ecosystems on water is the modification of its flows, not the creation or breakdown of water molecules.

Reporting categories of nature's contributions to people	Brief explanation and some examples
10 Regulation of organisms detrimental to humans	<p>Regulation, by ecosystems or organisms, of pests, pathogens, predators, competitors, etc. that affect humans, plants and animals, including e.g.:</p> <ul style="list-style-type: none"> • Regulation by predators or parasites of the population size of non-harmful important animals (e.g. large herbivore populations by wolves or lions) • Regulation (by impediment or facilitation) of the abundance or distribution of potentially harmful organisms (e.g. venomous, toxic, allergenic, predators, parasites, competitors, disease vectors and reservoirs) over the landscape or seascape • Removal of animal carcasses and human corpses by scavengers (e.g. vultures in Zoroastrian and some Tibetan Buddhist traditions) • Regulation (by impediment or facilitation) of biological impairment and degradation of infrastructure (e.g. damage by pigeons, bats, termites, strangling figs to buildings)
11 Energy	<ul style="list-style-type: none"> • Production of biomass-based fuels, such as biofuel crops, animal waste, fuelwood, agricultural residue pellets
12 Food and feed	<ul style="list-style-type: none"> • Production of food from wild, managed, or domesticated organisms, such as fish, beef, poultry, game, dairy products, edible crops, mushrooms, bushmeat and edible invertebrates, honey, edible wild fruits and tubers • Production of feed for domesticated animals (e.g. livestock, work and support animals, pets) or for aquaculture, from the same sources
13 Materials and assistance	<ul style="list-style-type: none"> • Production of materials derived from organisms in crops or wild ecosystems, for construction, clothing, printing, ornamental purposes (e.g. wood, fibres, waxes, paper, resins, dyes, pearls, shells, coral branches). • Direct use of living organisms for decoration (i.e. ornamental plants in parks and households, ornamental fish), company (i.e. pets), transport, and labor (including herding, searching, guidance, guarding)
14 Medicinal, biochemical and genetic resources	<ul style="list-style-type: none"> • Production of materials derived from organisms (plants, animals, fungi, microbes) used for medicinal and veterinary purposes • Production of genes and genetic information used for plant and animal breeding and biotechnology
15 Learning and inspiration	<ul style="list-style-type: none"> • Provision, by landscapes, seascapes, habitats or organisms, of opportunities for the development of the capabilities that allow humans to prosper through education, acquisition of knowledge and development of skills for well-being, scientific information, and inspiration for art and technological design (e.g. biomimicry)
16 Physical and psychological experiences	<ul style="list-style-type: none"> • Provision, by landscapes, seascapes, habitats or organisms, of opportunities for physically and psychologically beneficial activities, healing, relaxation, recreation, leisure, tourism and aesthetic enjoyment based on the close contact with nature. E.g. hiking, recreational hunting and fishing, birdwatching, snorkeling, gardening
17 Supporting identities	<ul style="list-style-type: none"> • Landscapes, seascapes, habitats or organisms being the basis for religious, spiritual, and social-cohesion experiences • Provisioning of opportunities by nature for people to develop a sense of place, purpose, belonging, rootedness or connectedness, associated with different entities of the living world (e. g. cultural and heritage landscapes, sounds, scents and sights associated with childhood experiences, iconic animals, trees or flowers) • Basis for narratives and myths, rituals and celebrations provided by landscapes, seascapes, habitats, species or organisms (e.g. sacred groves, sacred trees, totem animals) • Source of satisfaction derived from knowing that a particular landscape, seascape, habitat or species exist in the present

Reporting categories of nature's contributions to people	Brief explanation and some examples
18 Maintenance of options	<p>Capacity of ecosystems, habitats, species or genotypes to keep human options open in order to support a later good quality of life.</p> <p>Examples include:</p> <ul style="list-style-type: none">• Benefits (including those of future generations) associated with the continued existence of a wide variety of species, populations and genotypes• Future benefits (or threats) derived from keeping options open for yet unknown discoveries and unanticipated uses of particular organisms or ecosystems that already exist (e.g. new medicines or materials)• Future benefits (or threats) that may be anticipated from on-going biological evolution (e.g. adaptation to a warmer climate, to emergent diseases, development of resistance to antibiotics and other control agents by pathogens and weeds)
