Regional assessment on biodiversity and ecosystem services in the Americas

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UN environment

Food and Agriculture Organization of the United Nations

UNDP

IPBES: What is it and why was it established?

- Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
- Modeled on IPCC for similar science challenges
- Questions fundamentally complex
- Literature large but lack of consensus on many important points
- Challenges are global, as are drivers
- Policy options require large scale and small scale actions
- 129 States are now Parties, and growing
- Nine new members between 2017 and 2018 Plenaries

What are the core science questions?

- Are we actually losing biodiversity on global and regional scales?
- If so, does it matter to human well-being (and in what ways)?
- What are the drivers of the changes?
- What are policy options to address the drivers?

Conceptual framework in papers by Diaz and coauthors

- Chapter structure of assessments reflects logic
- Status and trend in Human well-being, Biodiversity, Drivers,
- Scenarios, Policy options

SUMMARY for POLICY MAKERS

What makes IPBES assessments novel and challenging

•Commitment to make extensive use of Indigenous and Local Knowledge as complete and equally legitimate knowledge systems – and then actually DOING IT.

• Commitment to reflect plurality of worldviews in interpretation of findings AND DOING IT.

What's been achieved?

•Thematic assessment on Pollinators and Methods Assessment on Scenarios (Feb 2016)

•Four Regional Assessments (Am, Af, ECA, AP) (March 2018)

•Thematic Assessment on Land Degradation and Restoration (March 2018)

Outline of the presentation for the Americas' Assessment

1. Background to the report and context of the Americas Assessment.
2. Current Status of the Americas
3. Nature´s Contributions to People in the Americas
4. Drivers of changes in nature, nature's contributions to people and quality of life
5. Trends and projections
6. Policy options
7. Knowledge gaps

1. Background to the report and context of the Americas assessment

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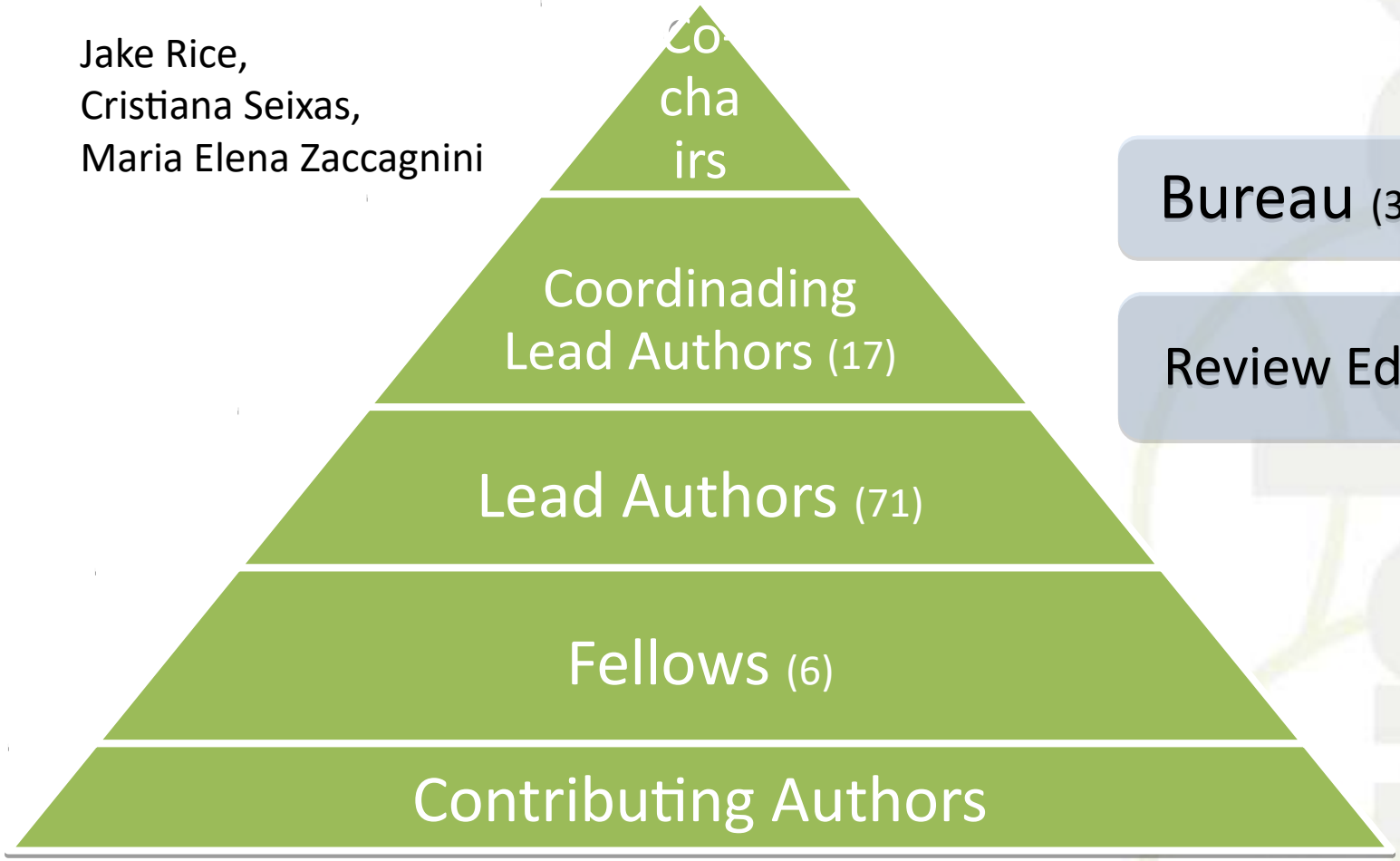
Process for the production of the Americas assessment report

The assessment expert team

Jake Rice,
Cristiana Seixas,
Maria Elena Zaccagnini

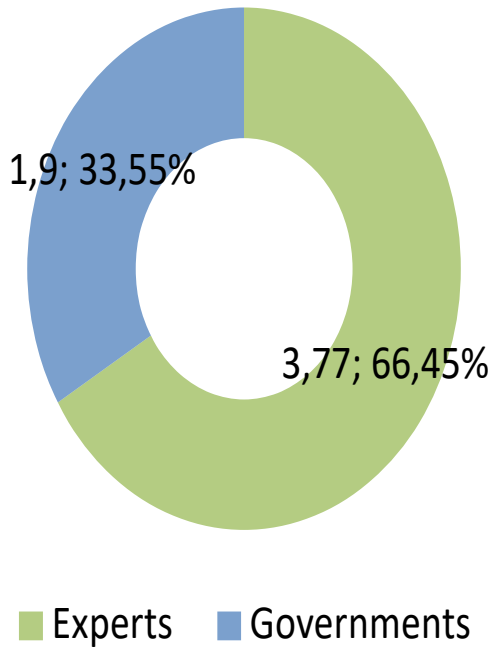


Bureau (3) MEP (4)

Review Editors (11)

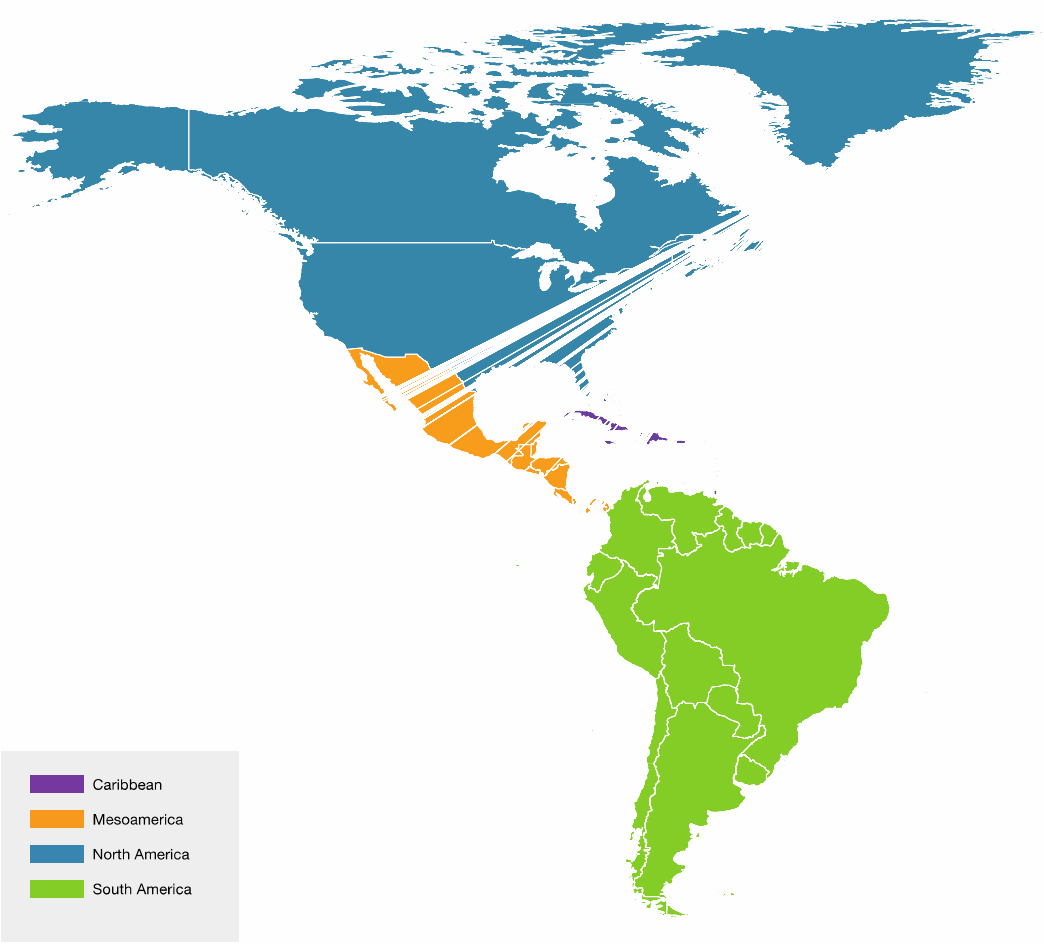
Review of the Assessment

Comments received from experts (5,666)



- Two external review phases
- More than 5,600 comments
- 247 external reviewers
- 12 Governments

The Americas region and subregions



2. Current status of the Americas

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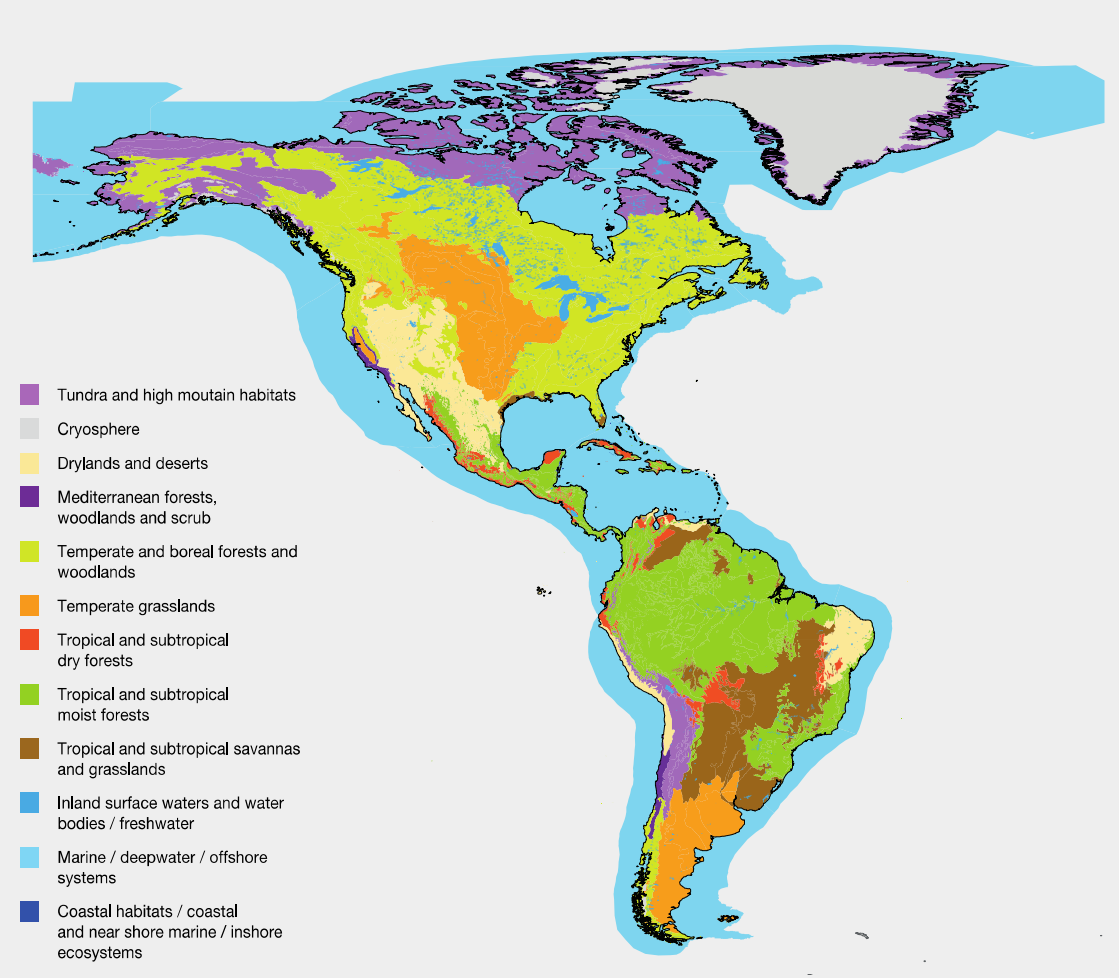
Status of the Americas

Units of analysis of the Americas assessment



- Includes 55 of the 195 terrestrial and freshwater world ecoregions.
- Hosts 20% of globally identified key biodiversity areas.
- Contains 26% of globally-identified terrestrial biodiversity hotspots.
- Close ¼ of the 14,000 species in taxonomic groups assessed by IUCN are classified as being at high risk of extinction.
- A center of origin and domestication for important crops (potato, quinoa, maize, beans, cacao, others).

Status of major biomes in Americas

Compared to pre-European settlement, reductions of

- 95 % of tall-grass prairie in North America;
- 72 % and 66 % of tropical dry forest in Mesoamerica and the Caribbean, respectively;
- 88 % of the South American Atlantic tropical forest,
- 70 % of the Rio de la Plata grasslands,
- 50 % of the tropical savanna
- 50 % of the Mediterranean forest,
- 34 % of the Dry Chaco
- 17 % of the Amazon forest

Have all been transformed to human-dominated landscapes

Status of the Americas

- 13% of the world's population accounting for 34% of the global GDP.
- Two of 10 largest HDI in the world and one of the poorest.
- 22.8% of the global ecological footprint.
- Over 66 million Indigenous Peoples and their values.
- Outstanding cultural diversity: 420 indigenous and tribal peoples (only in the Amazon) and hosts ~15% of the world's living languages.

3. Nature´s Contributions to People in the Americas

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Nature´s Contributions to People (NCP) in the Americas

- The Americas represent 40% of world ecosystems' capacity to produce nature-based materials consumed by people, and to assimilate by-products from their consumption.

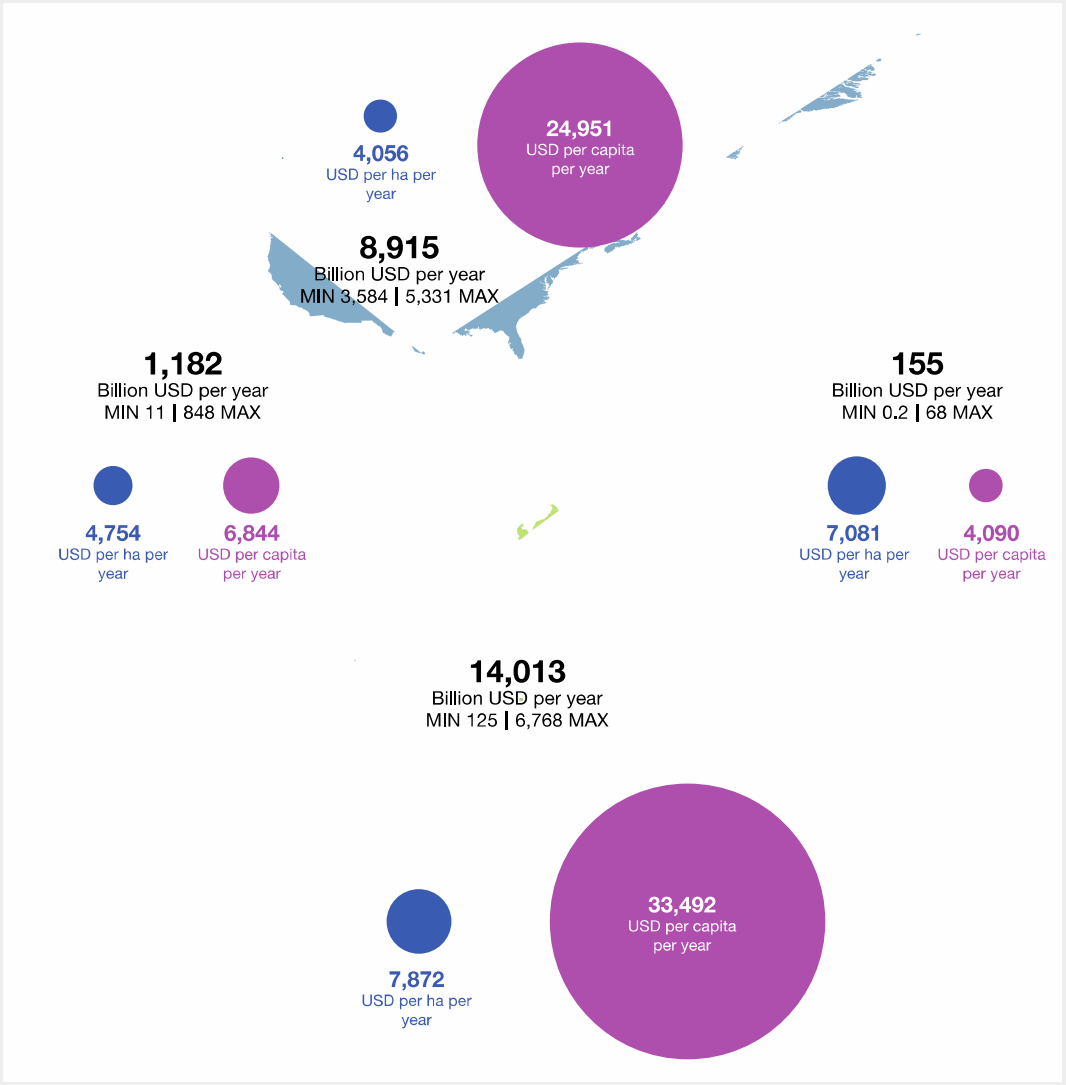
- This high capacity contributes in essential ways to food security, water security, energy security, livelihood security and health as well as providing non-material contributions.

- When economic values are assessed, the Americas' terrestrial NCP are equivalent to its Gross Domestic Product.

- Economic value of terrestrial NCP is more than $24.3 trillion per year.

SPM 6

Estimated economic values of ecosystem services in the Americas.



Source: Based on 2011 values f[rom] anza *et al.*, 2014 and Kubiszewski *et al.*, 2017.[16]
Prepared by IPBES Technical Su[pport Unit] on Values

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4. Drivers of changes in nature, nature's contributions to people and quality of life

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Main indirect anthropogenic drivers of changes in nature, nature's contributions to people and quality of life

- Population and demographic trends: current population growth rates are 0.75% per year in North America and 1.02% per year in Latin America and the Caribbean.

- Unsustainable patterns of economic growth: North America (24.2% of global GDP) is responsible of 16% of GHG. Latin America and Caribbean accounts for 7.6% of world GDP and 5.2% of GHG.

- Weaknesses in the governance systems: in most countries in the region, centralized modes of governance still prevail and transformation to decentralized forms have led to socio-environmental conflicts.

- Inequity: social inequity is still a concern for the various subregions of the Americas, with adverse implications for nature, NCP and good quality of life.

Main direct drivers of changes in nature, nature's contributions to people and quality of life

- Habitat conversion and fragmentation:
  - Land conversion (Approx. 1.5 million hectares of Great Plains grassland were lost from 2014 to 2015); wetlands are highly transformed in large tracts of the Americas, (between 1976 and 2008 the Pantanal wetlands lost around 12 per cent of their area).
- Overexploitation/overharvesting:
  - Marine fish harvests have peaked and are decreasing as stocks decline or management reduces harvest rates (20 to 70 % of stocks have been reduced by past overfishing).
  - Aquaculture grew from 3 % of total fish production in 1990 to 17 % in 2014. Not all production is from sustainable practices.
- Climate Change:
  - Changes in weather and local climate have caused changes in species distributions and interactions and in ecosystem boundaries: the retreat of mountain glaciers, and melting of permafrost and ice fields in the tundra.

5. Trends and projections

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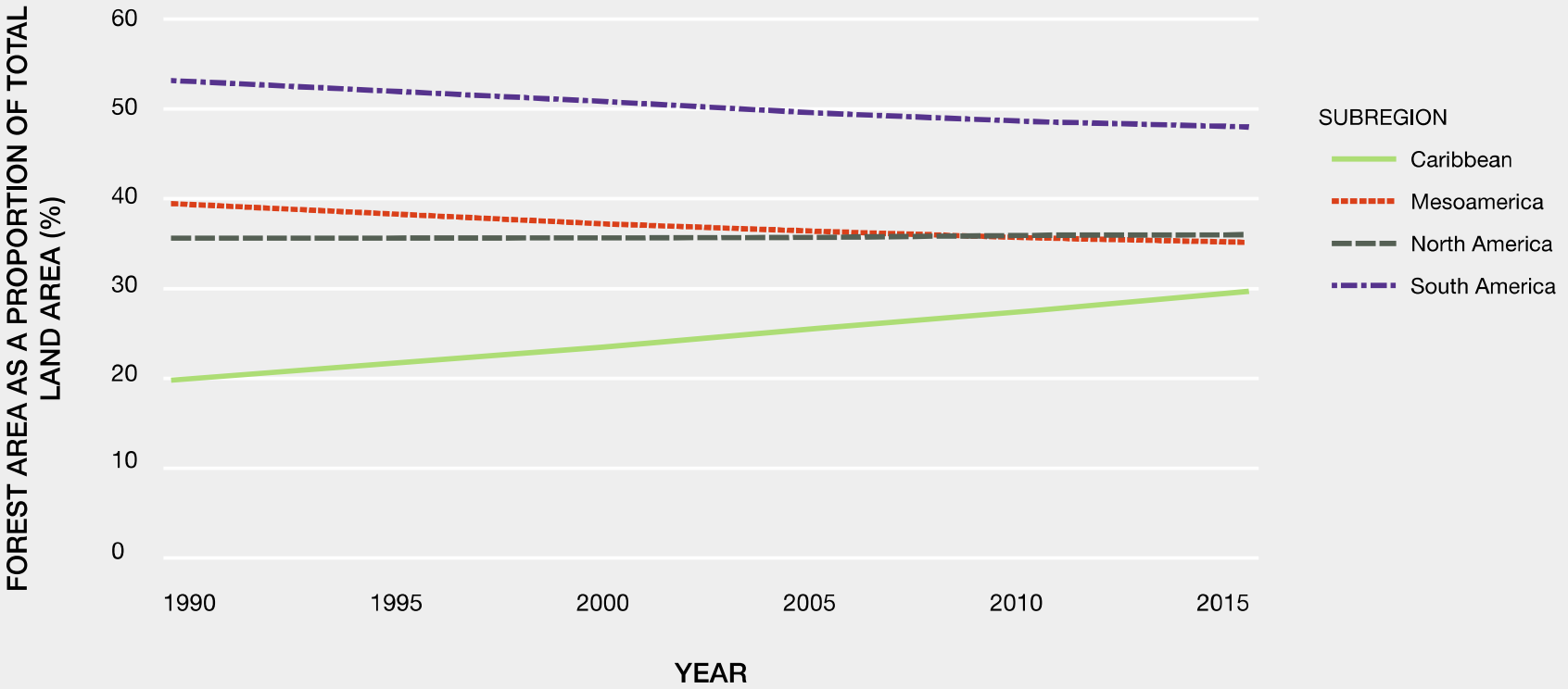
Trends in biodiversity

- Coral reefs had declined by more than 50% by the 1970s, and only 10% remained by 2003, followed by widespread coral bleaching in 2005.
- 9.5% of forest area in South America and 25% in Mesoamerica have been lost and net gains occurred in North America (0.4%) and the Caribbean (43.4%) since 1990.
- 15–60% of North American drylands habitat was lost between 2000 and 2009.
- It is estimated that approximately 30% of the mean species abundance in the Americas were lost by 2010.

SPM 3

Total forest cover trends by subregions.



Source: Indicator information from Food and Agriculture Organization of the United Nations, 2015 Glo resources assessment 2015 available at www.fao.org/forest-resources-assessment/en.
Visual prepared by the IPBES Task Group on Indicators (TGI) and Knowledge and Data Technical Sup based on raw data provided by indicator holders.
Prepared on November 21, 2017.

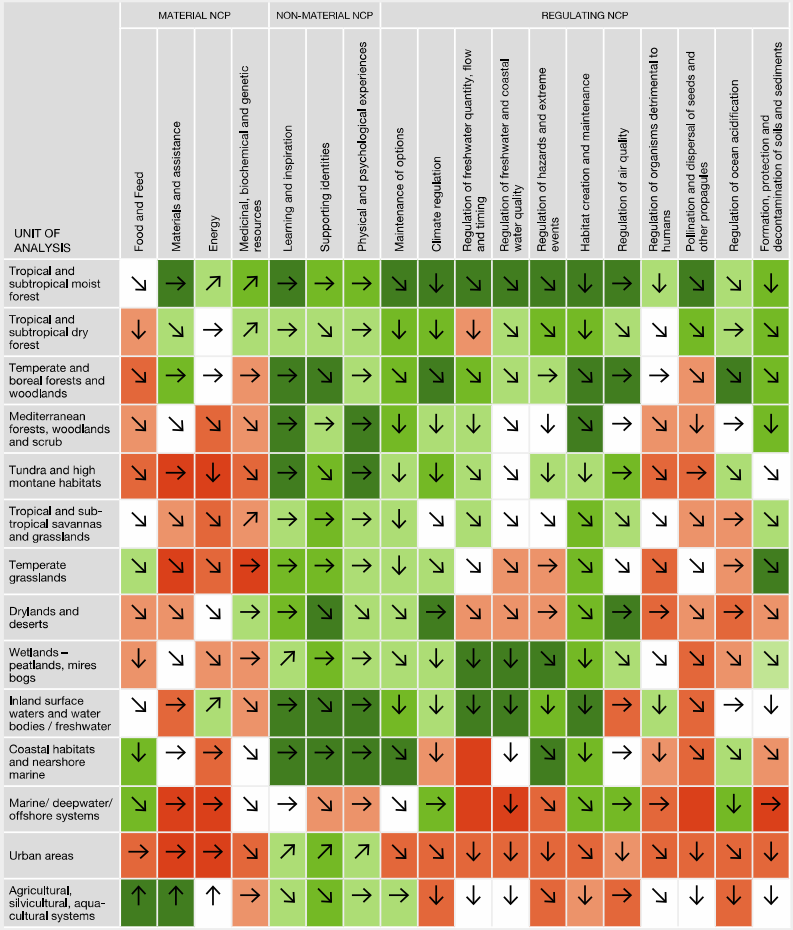
Trends in nature's contributions to people

Across the Americas 65% of nature's contributions to people are declining, with 21% declining strongly.

Particularly material NCP people use directly and some regulating NCP we depend on indirectly

SPM 5 **Trends in the provision of nature's contributions to people (NCP) for each unit of analysis.**

Trends and importance values are based on a modified Delphi process* to build consensus, as indicated by synthesis among experts from Chapters 2 and 3. Values were assigned based on the proportion of the unit of analysis that has not been converted by human activities. Squares without arrows indicate that there is no clear link [or trend] between nature's contributions to people for that category and the corresponding unit of analysis. (Note: the cryosphere is not considered in this analysis.)



* The Delphi method is a structured and iterative evaluation process that uses expert panels to establish consensus regarding the assessment of a specific topic.

Importance of unit of analysis for delivering each nature's contribution to people

Very High | High | Medium High | Medium | Medium Low | Low | Very Low

Direction of change in provision of each nature's contribution to people

↑ Strongly Increasing | ↗ Increasing | → Stable | ↘ Decreasing | ↓ Strongly Decreasing

Source: Own representation

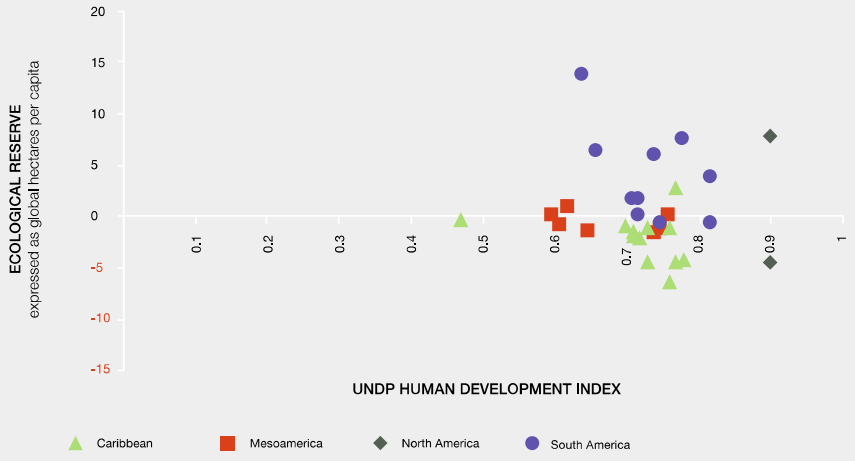
Trends in nature's contributions to people

- Per capita water supply is declining and there is widespread unsustainable use of surface water and groundwater in many parts of the region.

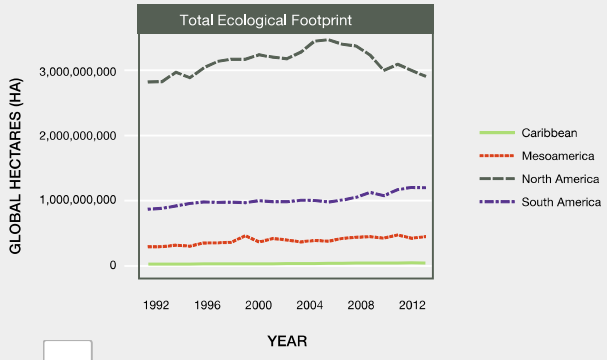
- Energy from nature-based sources, including cultivated biofuels and hydropower, has increased in all the subregions of the Americas.

- Humanity's ecological footprint in each subregion of the Americas has increased 200-300% since 1960s.

SPM 4 a **Ecological reserve, measured as "biocapacity" minus ecological footprint, can be either positive or negative. Estimates are presented per country in the Americas as a function of the United Nations Development Programme's 2012 Human Development Index.**



b **Total ecological footprint per subregion in the Americas between 1992 to 2012*.**



Source:

Figure A. All data from Global Footprint Network, 2016 and Word Wildlife Fund, 2016.[15]

Countries included: North America: Canada, United States; Mesoamerica: Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama; Caribbean: Antigua and Barbuda, Aruba, Bahamas, Barbados, British Virgin Islands, Cayman Islands, Cuba, Dominica, Dominican Republic, Grenada, Guadeloupe, Haiti, Jamaica, Martinique, Montserrat, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and Grenadines, Trinidad and Tobago; South America: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, French Guiana*, Guyana*, Paraguay, Peru, Suriname*, Uruguay, Venezuela. Asterix (*) indicates countries excluded from analysis in panel A.

Figure B. Indicator information from Global Footprint Network. Visual prepared by the IPBES Task Group on Indicators (TGI) and Technical Support Unit based on raw data provided by indicator holders. Prepared on October 27, 2017.

* Ecological Footprint is calculated as an index, and the method treats the result as an absolute value without uncertainty bounds. However, input data are national reports of landcover features, which have uncertainties that vary with jurisdiction. For more information on the ways data accuracy and quality are controlled, see section 2.6 and Borucke et al., 2013.[14]

40% 0f Global Bio-capacity, with 13 % of the global human population produces 22.8% of the global ecological footprint. (65% in North America)

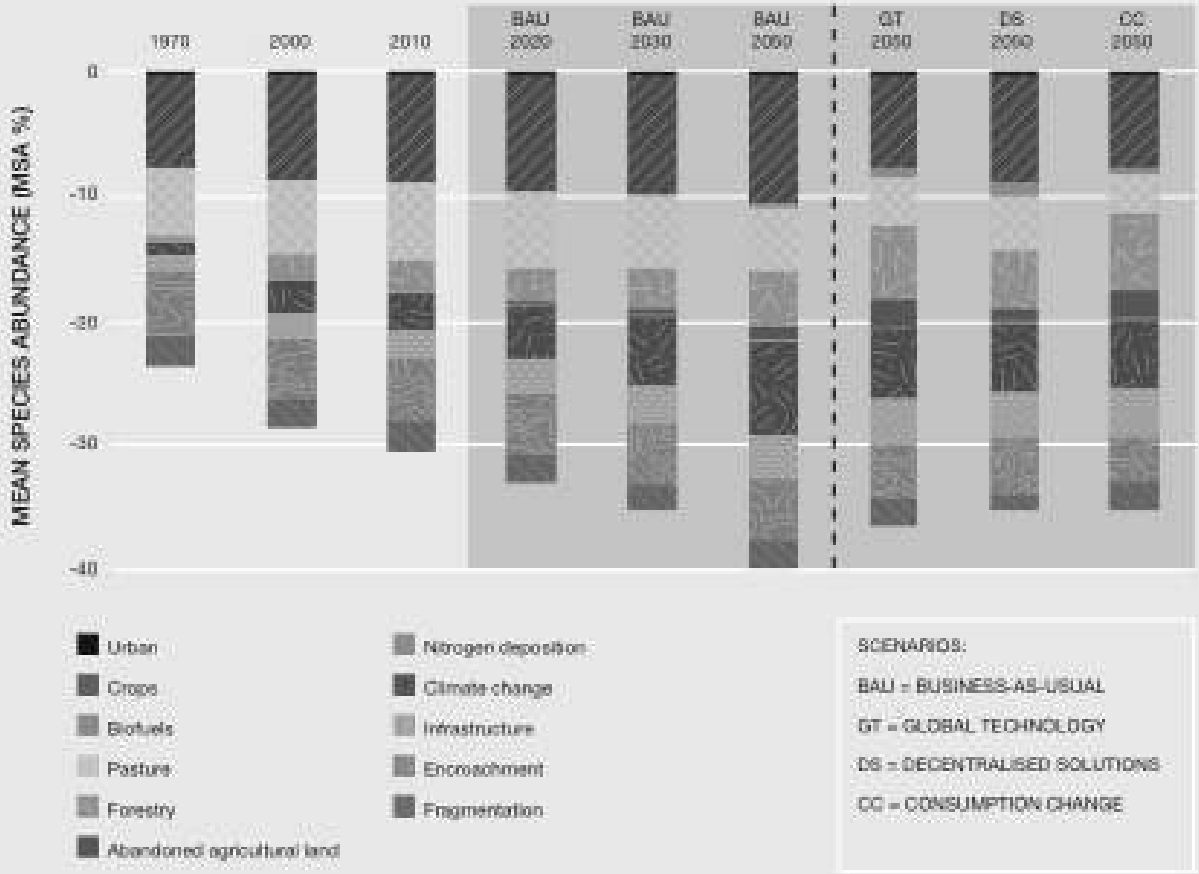
Ecological footprints DO grow and the footprints CAN change

Future trends in biodiversity and nature's contributions to people

- Key drivers of trends in biodiversity and nature's contributions to people are expected to intensify into the future, increasing the need for improved policy and governance effectiveness.
    - By 2050 the population of the Americas is projected to increase by 20% to 1.2 billion and the gross domestic product to nearly double, with concomitant increases in consumption.
    - Unsustainable agricultural practices and climate change are projected to be major drivers of further degradation of most terrestrial ecosystems.
    - Multiple drivers are projected to intensify and interact, often in synergistic ways, further increasing biodiversity loss, reducing ecosystems' resilience and the provision of present levels of nature's contributions to people.
    - Drivers of biodiversity loss and reduced nature's contributions to people are projected to increase in intensity if existing patterns of consumption and the policies underlying them continue.

SPM 7 Pressures driving biodiversity loss in the Americas.

This figure is an outcome of the Global biodiversity model for policy support (GLOBIO) developed by the Netherlands Environmental Agency (PBL). It was designed to quantify past, present and future human-induced changes in biodiversity at regional and global scales. The GLOBIO model includes a set of cause-effect relationships, used to estimate the impacts of human-induced environmental drivers on biodiversity through time. Mean Species Abundance (i.e. the mean abundance of original species in disturbed conditions relative to their abundance in undisturbed habitat)) is used as an indicator for biodiversity and reflects the degree to which an ecosystem is intact. The spatial information on drivers used by GLOBIO is derived from the Integrated Model to Assess the Global Environment (IMAGE 3.0) (Alkemade *et al.*, 2009) which operates at a resolution of 25 world regions for most important socioeconomic parameters and a geographical 0.5 x 0.5 degree grid for land use and environmental parameters, but does not include marine or coastal habitats.



Future trends in biodiversity and nature's contributions to people

- Continued loss of biodiversity could undermine achievement of some of the SGD's, as well as some international climate-related goals, targets and aspirations

- Despite reported reductions in the rate of degradation in some units of analysis, loss is projected to continue through 2050 and beyond, with land use change and climate change the dominant drivers compared to other drivers such as forestry and urbanization.

- Projections of further loss of biodiversity pose significant risks to society, because future ecosystems will be less resilient. They are expected to face an even wider array of drivers than have been the primary causes of degradation in the past

Tipping points are being approached.

Future trends in biodiversity and nature's contributions to people

- It is likely that few of the Aichi Targets will be met by the 2020 deadline for most countries in the Americas, in part because of policy choices and trade-offs with negative impacts on aspects of biodiversity.

- Decoupling of lifestyles from local habitats and direct degradation of the environment erode sense of place, language and local ecological knowledge, compromising cultural continuity.

61% of languages in the Americas are treatened or at risk

6. Policy options

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What initiatives are making a difference currently?

- An increase in protected areas
- Ecological restoration projects
- Strategies for making human-dominated landscapes (supportive of biodiversity and nature's contributions to people are essential)

- What options are available for progress
  - take into account short and long-term trade-offs, telecoupling and leakage and spillover effects on many scales.
  - Mainstreaming the environment effectively into economic and social development sectors.
  - No single governance approach including mixed governance systems
  - Behavioural change, individual – corporate – community – State
  - TABULATION of instruments and performance

Table 1 **Examples of policy options in the Americas: instruments, enabling factors and country-level challenges.**

SU=sustainable use; RE = recovery or rehabilitation of natural and/or human systems; PR = protection.

POLICY INSTRUMENTS	GOALS			ENABLING FACTORS (Way forward)	IMPEDIMENTS (Challenges more common to some countries than others)	CHAPTER -SECTION
	SU	RE	PR			
1. REGULATORY MECHANISMS						6 – 6.4.1
1.1 AREA-BASED						-
Protected areas	√	√	√	Legal basis for protecting or setting aside specific areas Community support for exclusionary measures Effective management authority by State, community or private sector Adequate resources for monitoring and enforcement	Weak or unstable legal basis for multi-sectoral management measures Insecure funding for on-going surveillance and enforcement of protection measures Low compliance with protection measures Lack of community support for measures Private sector investments threatened by spatial exclusions Fragmentation of sites and/or inadequate spatial connectivity	3 – 3.5.2 6 – 6.4.1.1
Other effective area-based conservation measures (OECM) (e.g., set-asides[1])	√	√	√			2 – Box 2.4 2 – 2.3.2 2 – 2.3.5 3 – Box 3.1 3 – 3.3.4 3 – 6 4 – Box 4.5 5 – 5.4.7 5 – 5.4.10 6 – 6.4.1.1
Indigenous and Community Conserved Areas (ICCA)	√	√	√	Capacity of self-organization Official acknowledgement of rights consistent with national legislation Mechanisms allowing co-management and/or self-governance systems	Weak or missing recognition of indigenous peoples and local communities rights and ownership/access to land by Central governments, neighboring communities or private sector	2 – 2.2.6 3 – 3.4.1.1 5 – 5.4.11 6 – 6.4.1.1 6 – 6.4.1.2
1.2 LIMITS						-
To technology (e.g., pollution control)	√		√	Adequate background information and risk analysis to set limits Technological advances to reduce or mitigate pollution /by-products while maintaining economic efficiency Adequate resources for monitoring and enforcement	Disproportionate political influence of industries Technological advances that outstrip or negate control mechanisms Low risk aversion in setting limits Weak monitoring and surveillance for compliance	3 – 3.2.2.3 3 – 3.2.3.2 3 – 3.2.4 4 – 4.4.2 6 – 6.2.1 6 – 6.6.2
To access (e.g., tourism, fisheries)	√		√	Governance capacity at local level Clear rules to manage potential sources of revenue Social cohesion and participation	Inability to regulate access to areas Lack of human and financial resources Excessive expectations from the market of enhanced consumer demand Inadequate sharing of benefits	4 – Box 4.19 4 – 4.3.3 6 – 6.6.1
1.3 MANAGEMENT						-
Ecosystem restoration	√	√		Technological and knowledge availability Economic incentives to overcome high costs favourable policy environment to promote restoration Funding for up-front costs to undertake restoration Mechanisms for cost recovery of benefits from successes	Lack of recognition of restoration in legal frameworks Inadequate funding for continuity of initiatives Insufficient knowledge to design effective restoration strategies for specific sites Lack of elimination of causes of original degradation Unreal expectations of time or funding needed for restoration to reach goals	2 – 2.2.8 2 – 2.2.11 2 – 2.2.13 4 – 4.4.1 5 – 5.4.7 6 – 6.4.1.2
Ecosystem-based approaches (e.g., EbA[2] and EcoDRR[3])	√	√	√	Availability of financing Receptiveness of industries to take on additional operating costs Inclusive governance with policy endorsement of Ecosystem Approaches to Management (use of the best knowledge available)	Weaknesses in science basis for broadening management context and accountabilities Lack of cost-effective operational tools to address full ecosystem effects of sectoral actions Lack of knowledge of transferability of progress from project to project Absence of policy framework explicitly calling for ecosystem approaches at sectoral levels	3 – 3.6 4 – Box 4.14 4 – 4.4.3 4 – 4.4.5 6 – 6.6.3
Control of Invasive-Alien Species (IAS)	√	√	√	Strong regulatory frameworks for pathways of introductions Availability of technologies for management and control Adequate monitoring for early detection Local capacity and collaboration networks for site-level mobilization of community resources for management or elimination	Shortage of scientific information on invasion pathways and likelihood of successful establishment Low awareness of risks by people involved in major invasion pathways Inadequate facilities for interception and quarantine facilities Inadequate or insecure funding for ongoing interception, monitoring and control	2 – 2.2.15 2 – 2.3.4 3 – 3.2.2.3 3 – 3.2.3.2 3 – 3.2.4.2 3 – 6 4 – 4.4.4 6 – Box 6.3
2. INCENTIVE MECHANISMS						6 – 6.4.3
Payment for Ecosystem Services (PES)	√	√	√	Trust building between service users and providers Direct linkages between buyers and sellers Adequate metrics for calculating payments Fair and transparent markets for exchange of payments Adequate monitoring when payment is for ongoing provision of services	Low return on investment for those paying for services Weak information basis for calculating appropriate payments Land tenure rights not adequate protected from payment arrangements Power structures that do not promote equitable and transparent payment agreements or distribution of payments Lack of recognition of non-market values of Nature and NCP when negotiating payment agreements, or lack of measures or governance processes to protect to values	2 – 2.5.1 4 – 4.3.1 6 – 6.4.2.1
Offsets	√	√		Sufficient science / knowledge base to quantify both impacts and expected benefits form offsets; Sufficient legal basis to authorize offsets as a mitigation options Adequate capacity for enforcement management and monitoring; Transparent and inclusive settings for establishing appropriate trade-offs of offsets for likely impacts.	Many weaknesses or gaps in knowledge basis for trade-off metrics, establishing equivalence, additionality, reversibility and appropriate time-scales, longevity Low availability of areas for spatial delivery of offsets Lack of resources for ongoing compliance monitoring Low adaptability of agreements on offsets, once established, if monitoring shows that benefits accruing are lower than expected or impact higher	6 – 6.4.2.2
Eco-certification	√			Adequate knowledge to set and enforce standards Reliable chain of custody for certified products Demand in high-value markets that can bear price increment for certainty of sustainability, High consumer recognition and credibility for certification labels	Weak government – private sector linkages High up-front costs to demonstrate sustainable practices and earn certification, before any economic benefits are realized Increases in operating costs so large that market competitiveness may be lost Lack of transparency in markets	2 – 2.2.1.3 2 – 2.2.1.5 2 – 2.2.2.1 6 – 6.4.2.3
3. RIGHTS-BASED APPROACHES						6 – 6.4.2
Rights of Mother Earth	√		√	Capacity of self-organization Official acknowledgement of rights consistent with national legislation Mechanisms allowing co-management and/or self-governance systems	Inadequate recognition of "rights" of Non-human persons in law Challenges in delimiting when such rights would be transgressed in areas already urbanized or under intensive cultivation	2 – 2.4 3 – Box 3.3 4 – Box 4.7 6 – 6.3.5
Access and Benefit Sharing (ABS)	√			Human and institutional capacities to grant access Capacity to monitor and negotiate mutually agreed terms Robust legal frameworks to require sharing benefits Inclusive, participatory mechanisms for establishing agreements	Weak legal basis to require benefit sharing of many uses of Nature Unrealistic expectations of quantity of monetary benefits Complexity and lengthy procedures for setting benefits Fundamental challenges to property rights, including intellectual property rights	2 – 2.4 2 – 2.5 2 – Box 2.6 2 – 2.7 6 – 6.4.2.4

1. Set-asides: areas set-aside for conservation inside private properties; 2. EbA = ecosystem-based adaptation to climate change; 3. EcoDRR = ecosystem-based disaster risk reduction.

Source: Own representation

Policy options

Examples of Policy options in the Americas: Policy instruments

- Regulatory mechanisms.
  - Area based: Protected areas; indigenous and community conserved areas.
  - Limits: to technology (pollution control); to access (tourism, fisheries).
  - Management: ecosystem restoration; ecosystem-based approaches; control of invasive-alien species.

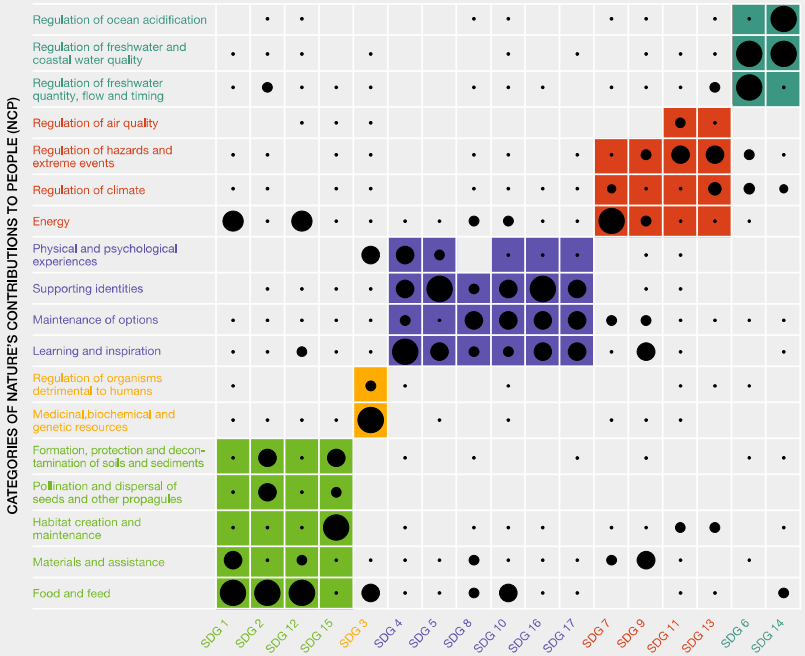
Policy options

Examples of Policy options in the Americas: Policy instruments

- Incentive mechanisms:
  - PES.
  - Offsets.
  - Eco-certification.
- Rights-based approaches:
  - Rights of Mother Earth.
  - Access and benefit sharing.

SPM 10 Bundles of Nature's Contributions to People (NCP) that are considered to be a priority for achieving Sustainable Development Goals (SDGs).

Bundles of nature's contributions to people that are a priority for achieving the Sustainable Development Goals. To identify the nature's'contributions to people that potentially contribute the greatest amount to achievement of specific Sustainable Development Goals, expert opinions were elicited from the Americas assessment authors to determine the level of consensus regarding the three most important nature's contributions to people for each Sustainable Development Goals*. Statistical methods were then used to identify clusters with similar relationships between nature's contributions to people and Sustainable Development Goals. Blank cells indicate that no expert identified it as a priority, and the size of dots within cells illustrates the level of consensus among experts (% of respondents who prioritized a nature's contributions to people for a specific Sustanaible Development Goals).



LEVEL OF CONSENSUS

- 3-25%
- 26-40%
- 41-70%
- 71-100%

PRIORITY NCP/SDG BUNDLES

- Food and Material Security
- Health
- Energy and Climate
- Water Quality and Quantity
- Relational Values Affecting Quality of Life

SUSTAINABLE DEVELOPMENT GOALS (SDG)

- SDG 1: No poverty
- SDG 2: Zero hunger
- SDG 3: Good health and well-being
- SDG 4: Quality education
- SDG 5: Gender equality
- SDG 6: Clean water and sanitation
- SDG 7: Affordable and clean energy
- SDG 8: Decent work and economic growth
- SDG 9: Industry, innovation and infrastructure
- SDG 10: Reduced inequalities
- SDG 11: Sustainable cities and communities
- SDG 12: Responsible consumption and production
- SDG 13: Climate action
- SDG 14: Life below water
- SDG 15: Life on land
- SDG 16: Peace, justice and strong institutions
- SDG 17: Partnerships for the goals

*The Delphi method is a structured and iterative evaluation process that uses expert panels to establish consensus regarding the assessment of a specific topic. For more information on the method, see section 2.7.

Source: Data collected by C.B. Anderson, C.S. Seixas & O. Barbosa from >1/3 of the experts actively contributing to the Americas Assessment in all the chapters. Analysis by J. Diaz in R software package.

7. Knowledge Gaps

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Knowledge gaps

- Much biodiversity remains to be scientifically recorded for all types of ecosystems.

- More comprehensive assessments of costs, benefits and values are necessary to more fully understand the relationship of nature and quality of life at the regional and subregional scales.

- There is a mismatch between social data related to quality of life produced at the political scale and ecological data produced at a biome scale impeding integration and comparison.

- The assessment of non-material NCP that contribute to quality of life

Knowledge gaps

- The linkages from indirect to direct drivers and from the drivers to specific changes in biodiversity and NCP.

- The factors that affect the ability to generalize and scale up or down the results of individual studies.

- The evaluation of the impacts of short-term and long-term policy and programmes.

Thank you!

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