

Integrated Biodiversity Management in Exemplar Regions of Colombia – Project ColBioDiv



The Colombian-German Biodiversity Research Network

- 2012 – First agreement between Botanic Gardens Berlin and Bogotá
- April 2018 – A collaborative Colombian - German Biodiversity Research Network implements the ColBioDiv project



German partners

Colombian partners

Institut für Geographie	Botanischer Garten Botanisches Museum Berlin	Jardín Botánico José Celestino Mutis	Universidad Nacional de Colombia
Ibero-Amerikan. Institut	Latein-Amerika Institut	Universidad Del Norte	Instituto Alexander von Humboldt
		Proyecto Rastrojos	Fundación Ecosistemas Secos Colombia

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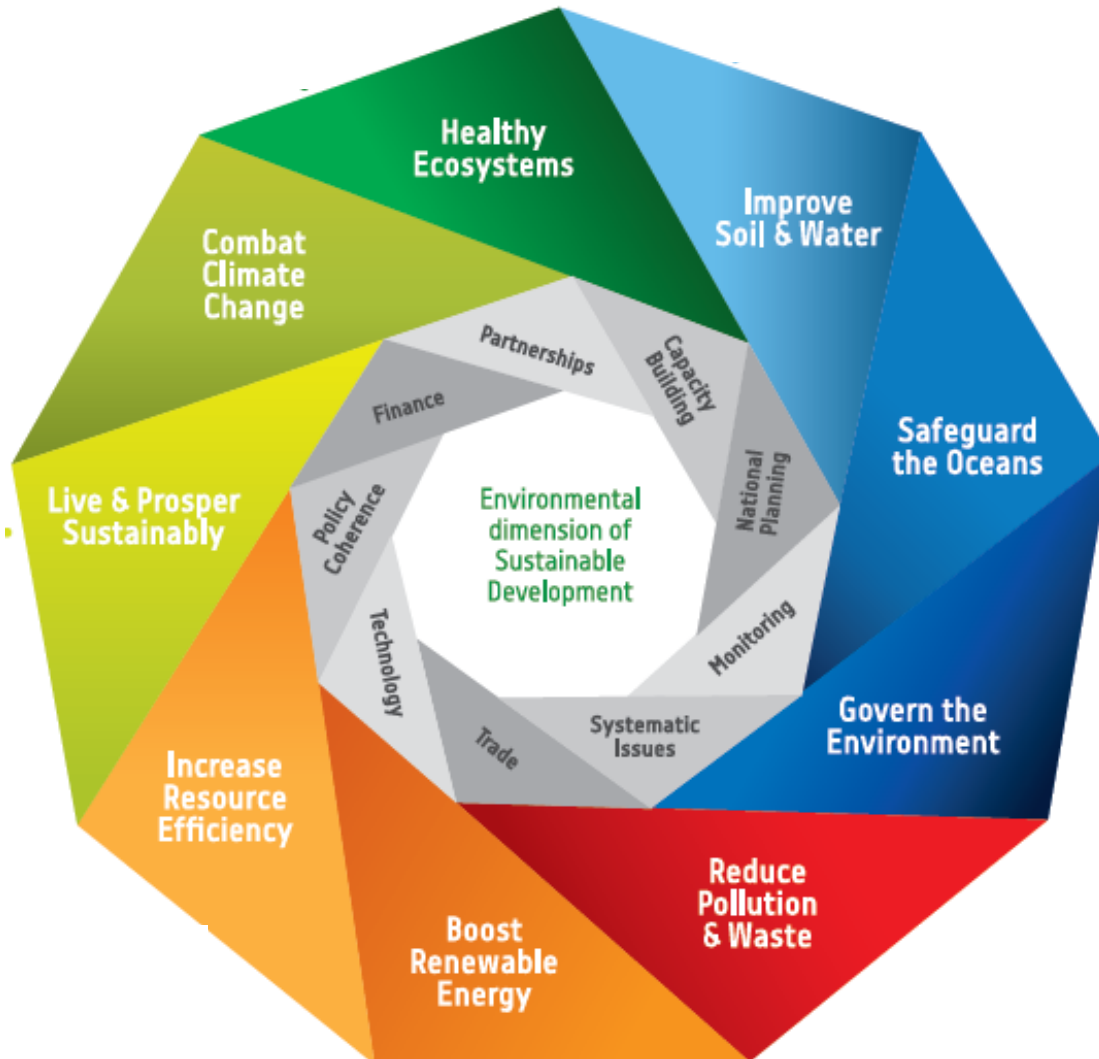
Federal Ministry of Education and Research

Agenda 2030 for sustainable development

- Was adopted on 25th September 2015 by the UN general assembly
- Connects goals of poverty alleviation and development (Millennium development goals) with the agenda on sustainability (Rio-Process)
- 5 main strategic fields:
People, Planet, Prosperity, Peace, Partnership – "5 Ps").



Environmental dimension of sustainable development



Agenda 2030 for sustainable development

The Global Goals for Sustainable Development



International agreements on biological diversity

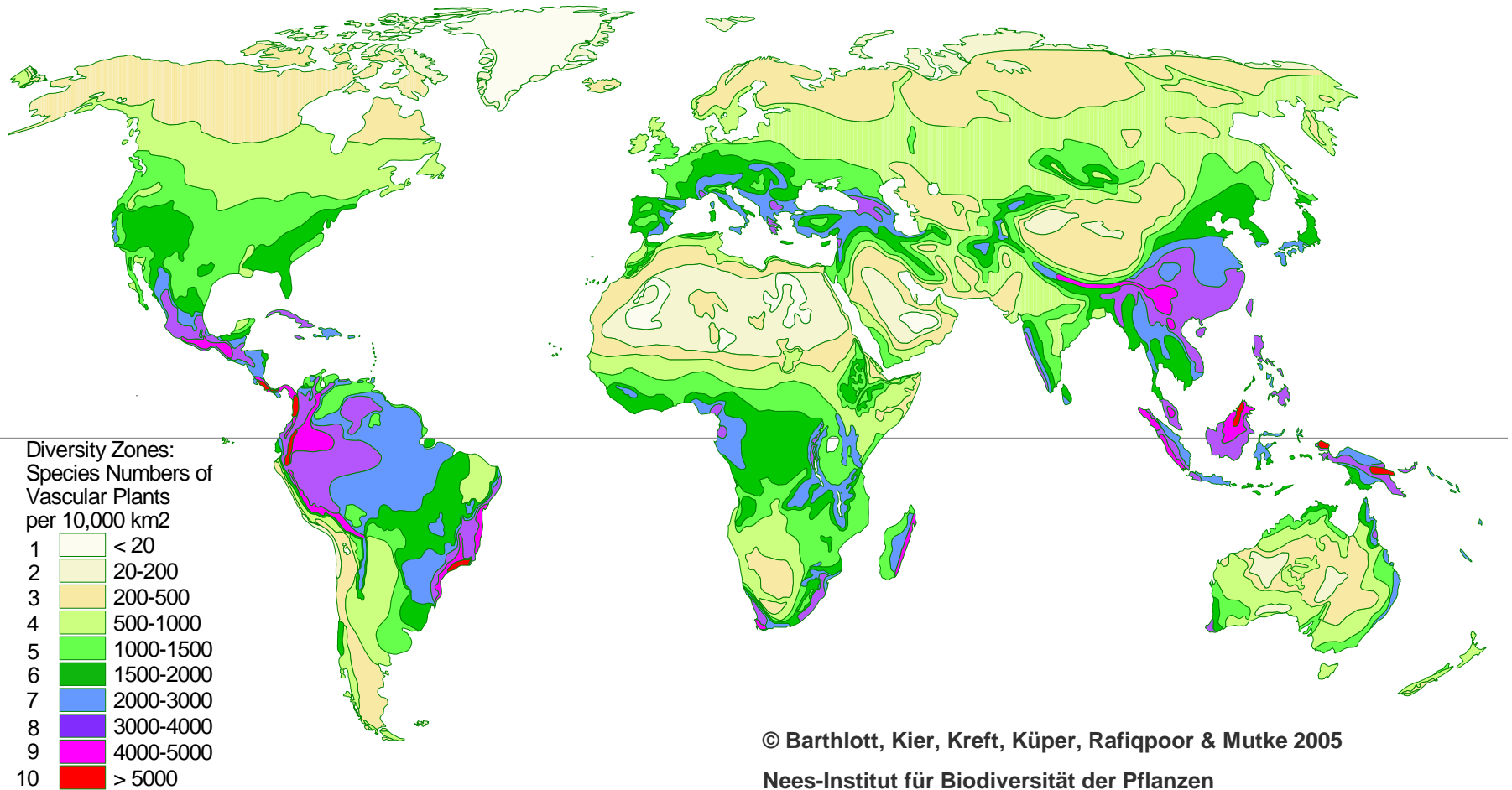
Strategic plan to safeguard biodiversity 2011-2020

- | | | | |
|--|--|---|--|
|  1 Awareness of biodiversity increased |  2 Biodiversity values integrated |  3 Incentives reformed |  4 Sustainable production and consumption |
|  5 Habitat loss halved or reduced |  6 Sustainable management of aquatic living sources |  7 Sustainable agriculture, aquaculture and forestry |  8 Pollution reduced |
|  9 Invasive alien species prevented and controlled |  10 Ecosystems vulnerable to climate change |  11 Protected Areas |  12 Reducing risk of extinction |
|  13 Safeguarding genetic diversity |  14 Ecosystem services |  15 Ecosystem restoration and resilience |  16 Access to and sharing benefits from genetic resources |
|  17 Biodiversity strategies and action plans |  18 Traditional knowledge |  19 Sharing information and knowledge |  20 Mobilizing resources from all sources |

Fulfilling these goals requires:

Knowledge generation + data availability, education and awareness, development of best practise approaches and implementation

Biodiversity: Global Species Numbers of Vascular Plants



Global biodiversity hotspots: the study from Myers et al. 2000

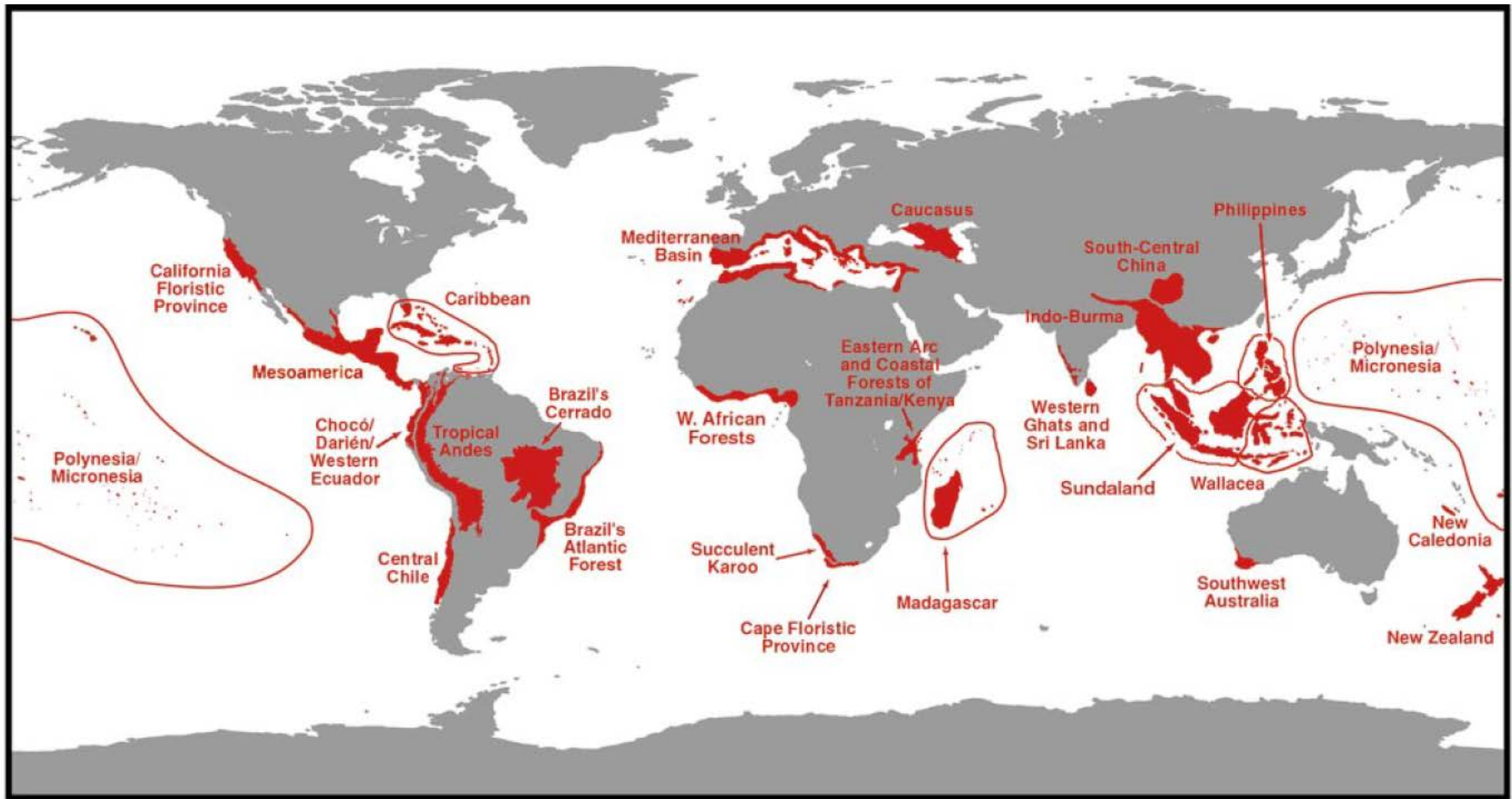


Figure 1 The 25 hotspots. The hotspot expanses comprise 30–3% of the red areas.

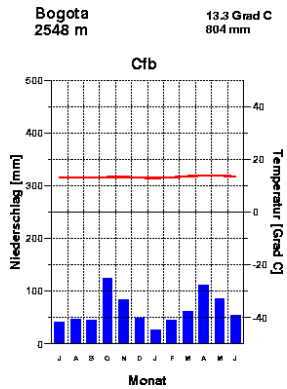
ColBioDiv – a multidisciplinary biodiversity research project

ColBioDiv – Major objectives

- Providing the scientific basis for integrated biodiversity management.
- Elaboration of sustainable models and provision of exemplar management plans based on them.
- Solutions for the environmentally-friendly development of rural areas in the vicinity of urbanizing zones.

ColBioDiv – a multidisciplinary biodiversity research project

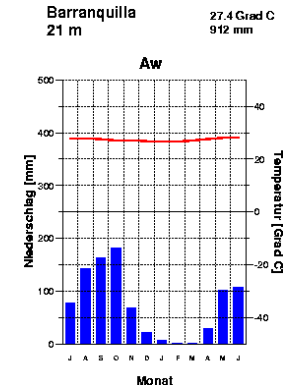
Bogotá and the Distrito Capital



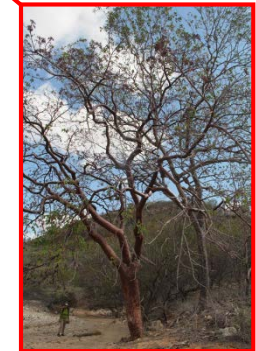
Bosque Altoandino & Páramo



Barranquilla and its hinterland



Bosque Seco Tropical



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Objectives

- Biodiversity assessment
- Ecosystem evaluation
- Landscape sensitivity assessment
- Ecosystem impact assessment
- Design of a management concept
- Promotion of local capacities

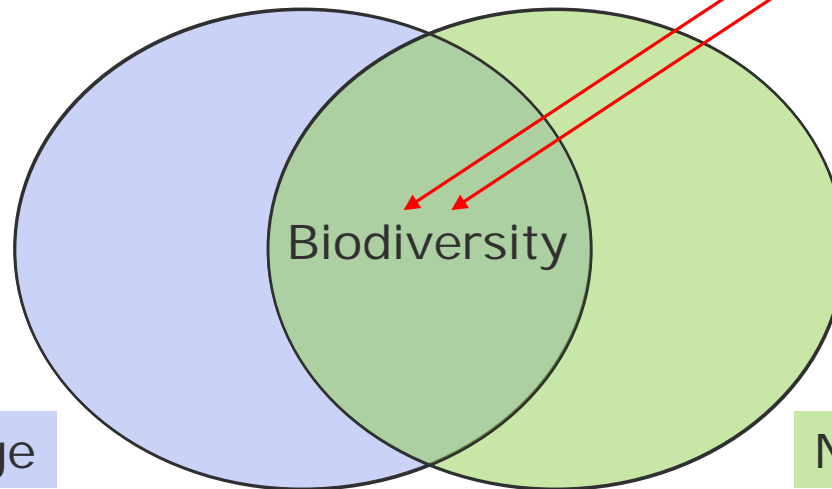
The study areas

- comparative analysis of two study areas
- locations in fast-growing regions in Colombia
- areas highly relevant for biodiversity conservation
- representative setting for the development of integrated biodiversity management in urbanizing regions of Colombia

ColBioDiv – a multidisciplinary biodiversity research project

Multiple disciplines needed

Social dynamics and global climate change influence biodiversity



Cultural heritage

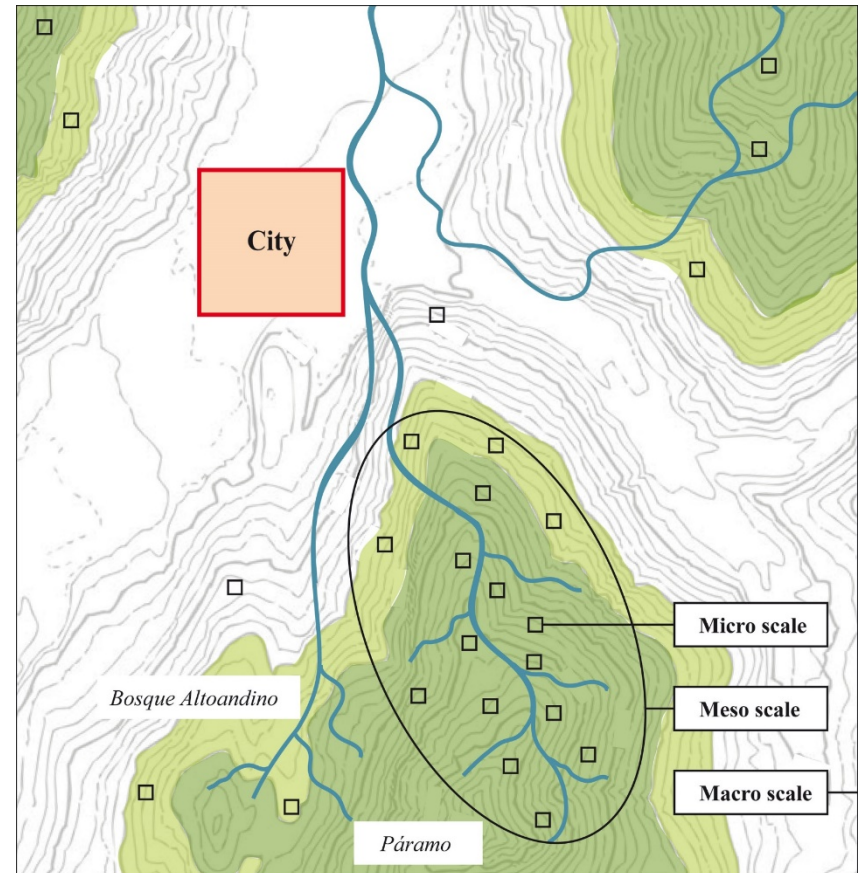
Natural heritage

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Study design

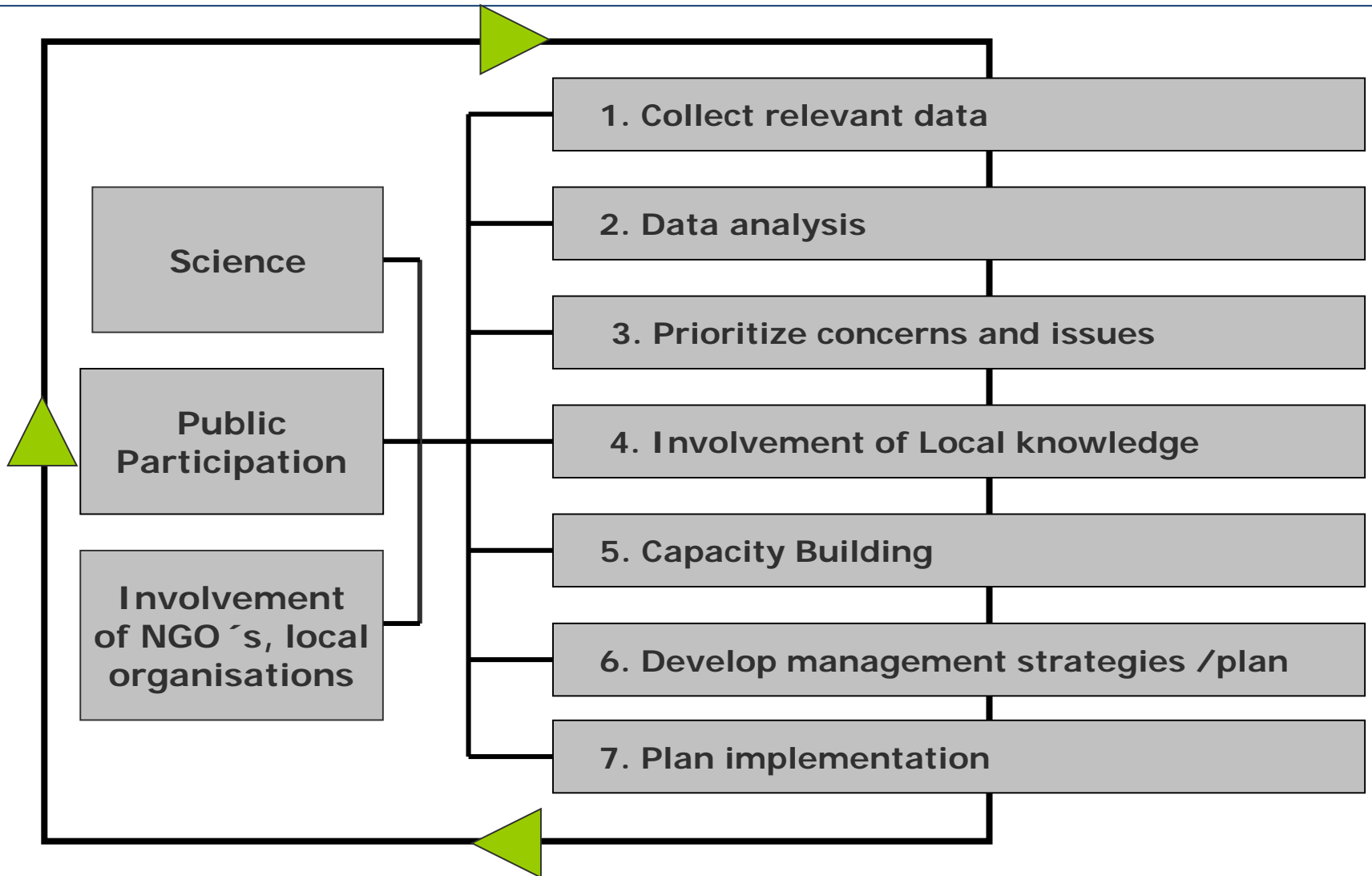
The project works on different scales:

- I. **micro-scale**, i.e., the geographically smallest and least complex scale, represented by local plots (20 m x 20 m = 0.04 ha in size; small squares)
- II. **meso-scale**, i.e., the regional scale (according to vegetation type, altitudinal belt and sub-drainage basin, respectively; encircled)
- III. **macro-scale**, i.e., the supra-regional scale (here defined as type of ecosystem and high-order catchment area, respectively; entire study area)



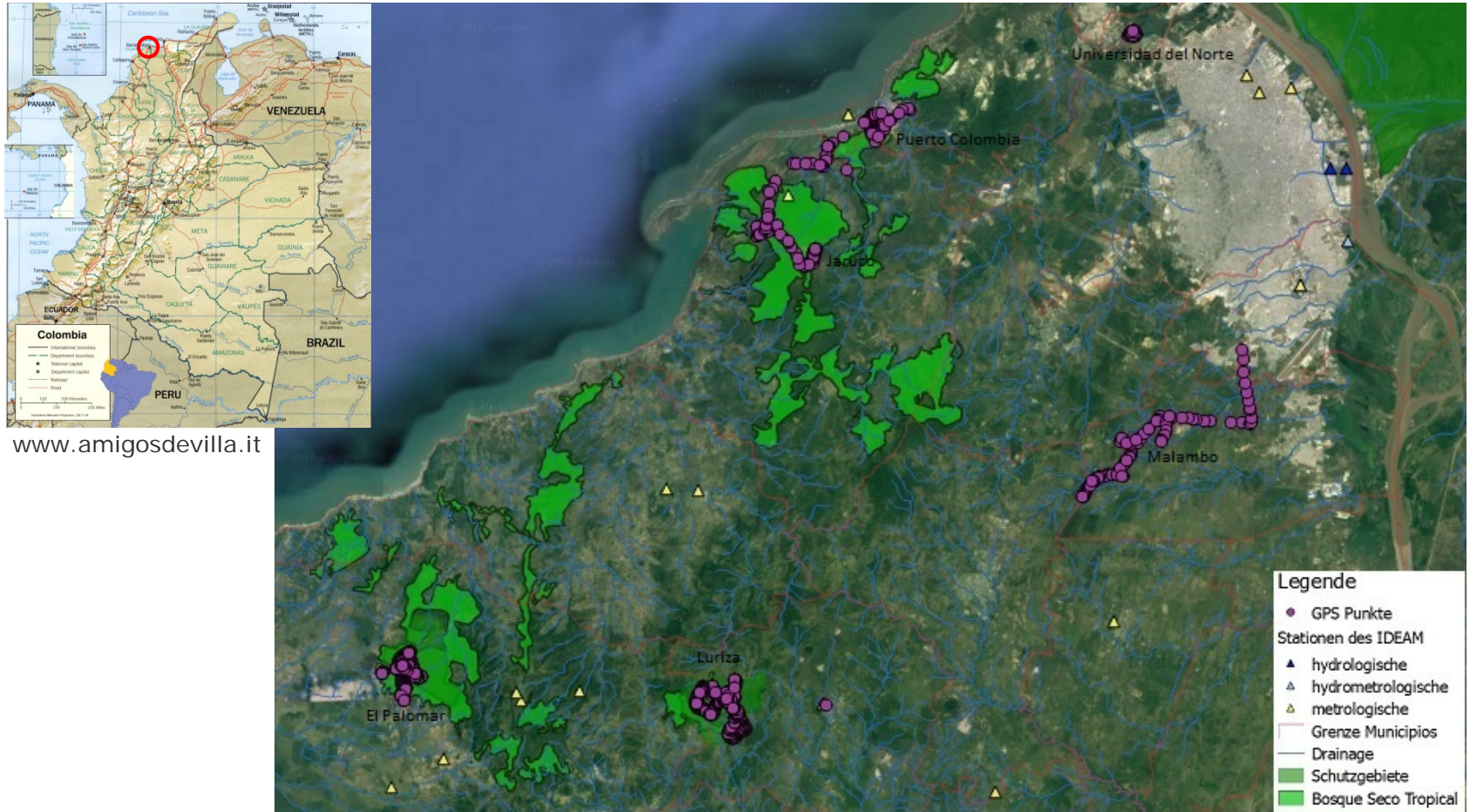
Outline of the study design using the *Bosque Altoandino* and the *Páramo* as examples

Workflow of Integrated Biodiversity Management



Proyecto de investigación multidisciplinario sobre la biodiversidad

Fieldwork 2016 – Remote sensing images



Elaborado por Henry Schubert

Tropical dry forest: Primary vegetation (Baranquilla, Colombia)



Secondary vegetation Biodiversity ?
Biomass
Erosion



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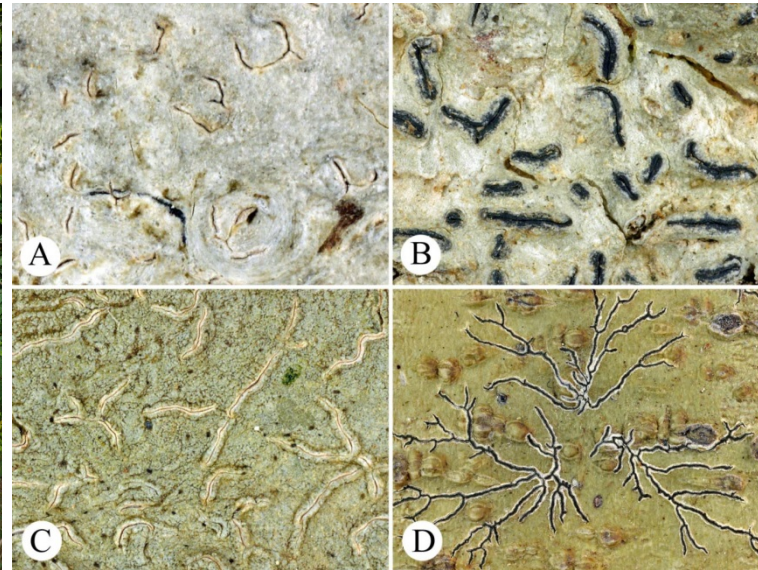
First results & experiences obtained so far (WP1)

- Assessment of biodiversity data in the field (in plots near Baranquilla), data capture from specimens in herbaria, identification of species and mapping of distributions

PhD student
Astrid de Mestier
collecting plant
material in the
Colombian
Caribbean



Many new
records, plant
identification
without a Flora...



Four lichen
species new to
science

(Lücking et al.
(Caldasia, in
press))

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First results & experiences obtained so far (WP3)

Acquisition of remote sensing images and generation of climate & soil data to analyze land use and land use changes and for assessing landscape sensitivity

Remote sensing image from the Andean region (l.)



Soil erosion is a major problem in the Colombian Caribbean (c.)



PhD student Henry Schubert gathering data on infiltration capacity of the soil close to Barranquilla (r.).

ColBioDiv – a multidisciplinary biodiversity research project

Application of results contributes to

- Regional development planning
- Environmental protection (communities, protected areas)
- Environmental education

- Intergovernmental Platform on Biodiversity & Ecosystem Services (IPBES)
- Sustainable development goals (United Nations)

- Scientific progress, international collaboration, scientific capacities