Drivers of Biodiversity and Forest Loss

Tony Atah

tonyatah@gmail.com

Nigeria's forest and biodiversity

- Nigerian population is currently over 200 million and estimated to be over 400million by 2050.
- Ecological biomes range from the 857km^2 stretch coastal marine ecosystem in the south, through a belt of the Guinean Rainforest zone, extensive Guinea Savanna woodland, the Sudan Savanna grassland and a dry Sahel scrubland threatened with the fast expanding influence of the Sahara desert in the north.
- The country's two main river systems, the Benue and the Niger and their associated tributaries, form a huge network of hydrological systems and wetlands.
- The country is endowed with rich biodiversity – some 4,600 plant, 839 bird and 274 mammal species.
- The Gulf of Guinea's forests stretch into southern Nigeria: these forests are recognized as a global biodiversity hotspot.

Importance of Forestry Sector in Nigeria's Economy

- The forestry sector plays an important role in the Nigerian economy in the provision of goods and ecosystems services, and contributes to the sustainability of the environment.
- The sector offers opportunities for sustainable livelihoods and poverty eradication in the country, particularly in rural areas where the majority of the people live.
- The Country Report for Nigeria for the Forest Resource Assessment of 2015 estimated that forestry products contributed 2.4% to Nigeria's GDP.

State of the Forest in Nigeria

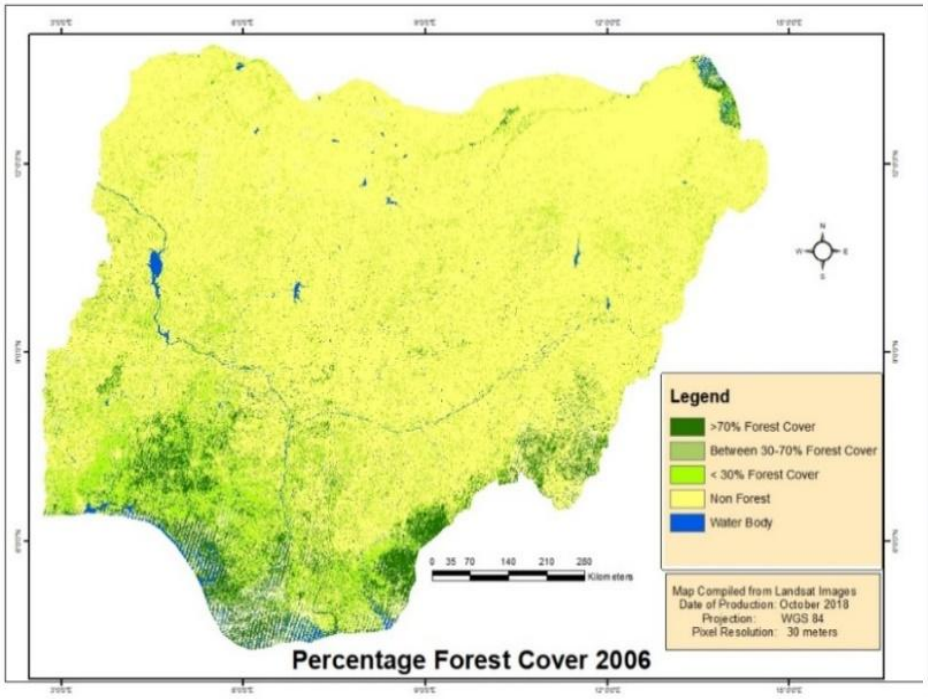
- Nigeria has one of the world fastest rates of deforestation having lost over 90% of its original forest resources (FME 2010).
- The loss is a result of long term pressures from agricultural development, uncontrolled forest exploitation and urbanisation.
- **Currently less than 10% of the country is forested.**

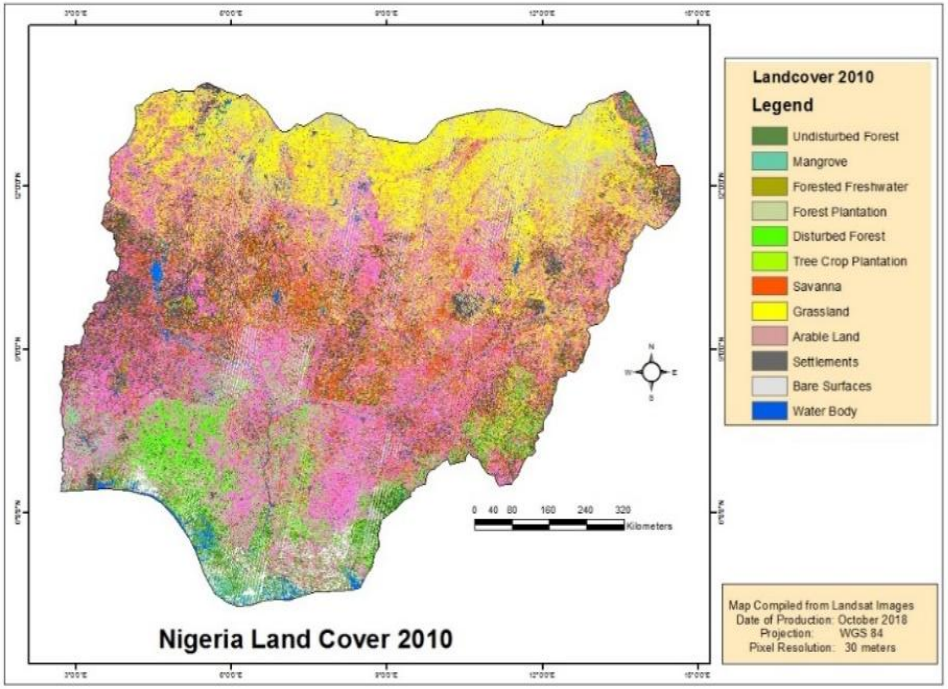
A Case of Continuing Rapid Deforestation

- According to the U.N. FAO, 9.9% or about 9,041,000ha of Nigeria is forested.
- Between 1990 and 2010, Nigeria lost an average of 409,650 ha or 2.38% per year.
- Between 1990 and 2010, Nigeria lost 47.5% of its forest cover, or around 8,193,000 ha.
- Corresponding loss in biomass = 42% (i.e about 2 billion tonnes of carbon).
- Forest ecosystem services are at risk.
- The total value of forest ecosystem services based on valuations done between 2000 and 2015 is approximately 1million Naira (USD2857)/ha.

1978 LUV Map

1995 LUV Map


Legend
>70% Forest Cover
Between 30-70% Forest Cover
< 30% Forest Cover
Non Forest
Water Body
0 35 70 140 210 280
Kilometers
Map Compiled from Landsat Images
Date of Production: October 2018
Projection: WGS 84
Pixel Resolution: 30 meters
Percentage Forest Cover 2006


Landcover 2010
Legend
Undisturbed Forest
Mangrove
Forested Freshwater
Forest Plantation
Disturbed Forest
Tree Crop Plantation
Savanna
Grassland
Arable Land
Settlements
Bare Surfaces
Water Body
0 40 80 160 240 320
Kilometers
Map Compiled from Landsat Images
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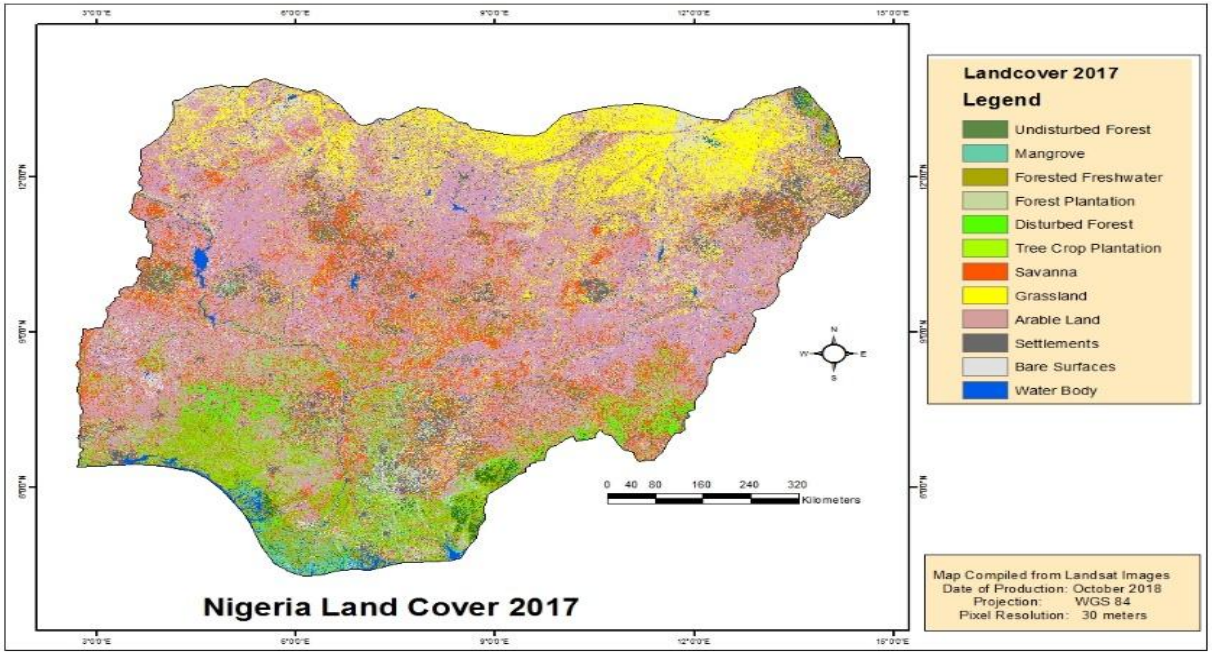
Nigeria Land Cover 2010


Landcover 2017
Legend
Undisturbed Forest
Mangrove
Forested Freshwater
Forest Plantation
Disturbed Forest
Tree Crop Plantation
Savanna
Grassland
Arable Land
Settlements
Bare Surfaces
Water Body
0 40 80 160 240 320
Kilometers
Map Compiled from Landsat Images
Date of Production: October 2018
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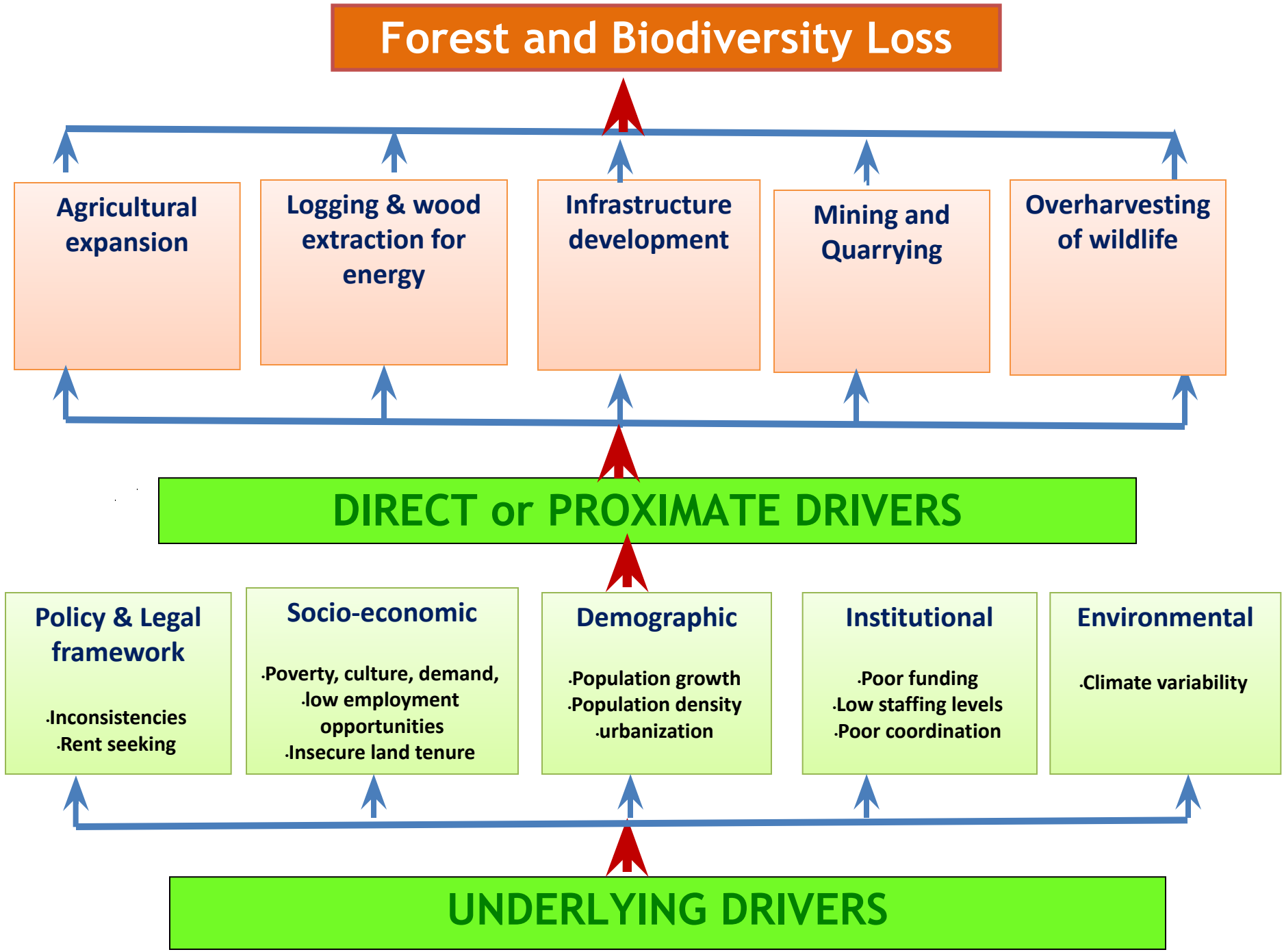
Nigeria Land Cover 2017

Implications for GHG emission

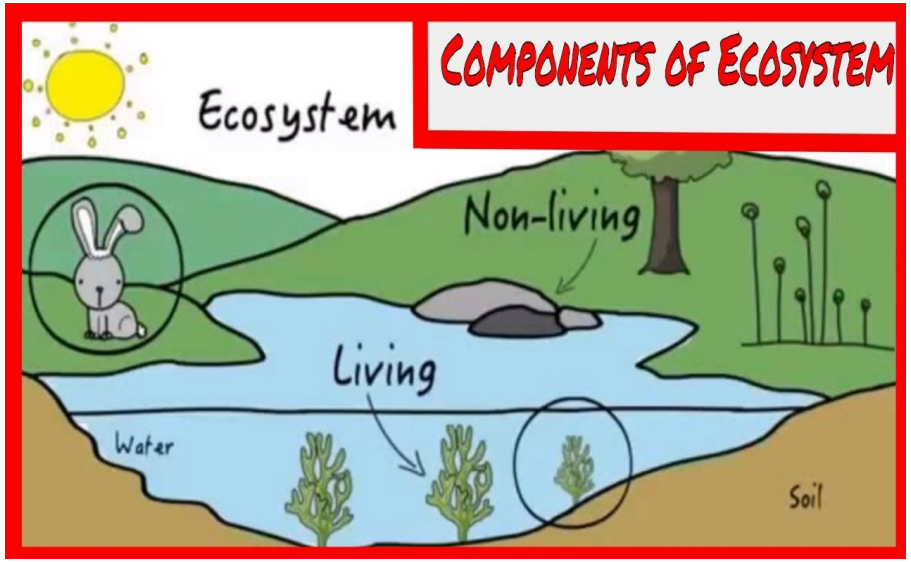
- Nigeria's Second National Communication to the UNFCCC presented a conservative estimation of 2.5% per annum rate of deforestation.
- It uses 1990 values of 9.5MtCO_2e/year as the country's baseline for GHG emission.
- Projected growth by year 2030 = 26.5MtCO_2e/year.
- 2018 assessment indicates an emission figure of 32.4MtCO_2.
- Nigeria has surpassed the predicted figure for 2030 emissions projection, 12 years earlier.

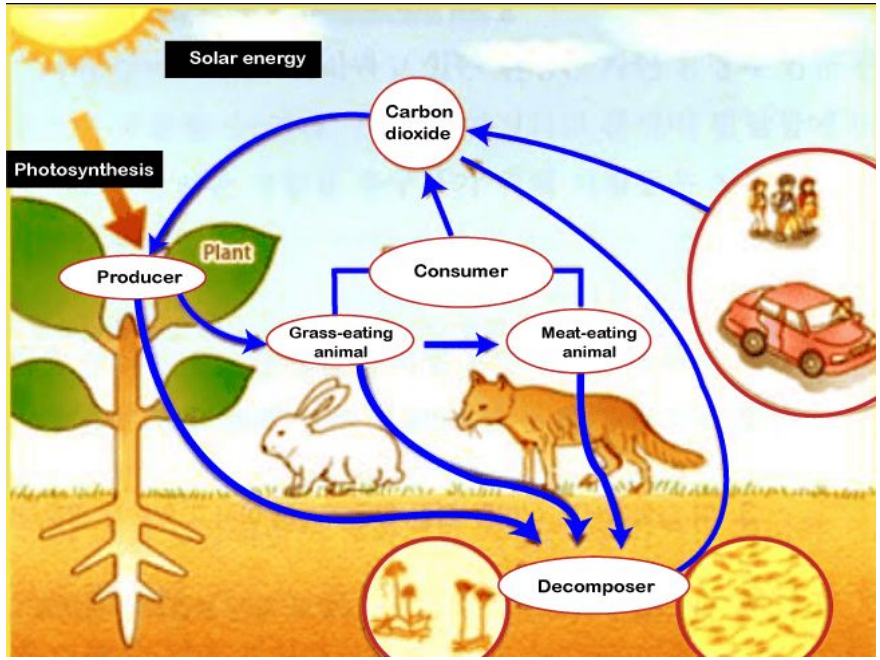
Increasing Forest Emission – Facts and Figures.

- Total carbon emission from the land use and deforestation rose from 9.94MtCO_2e in 2000 to 26.77MtCO_2e in 2010.
- Between 2006 and 2016, the total emissions were approximately 32.4MtCO_2e, representing about 4.5% of the GHG emissions in Nigeria.
- Nigeria's third National Communication to the UNFCCC uses **1990 values of 9.5MtCO_2e/year as the country's baseline** for GHG emission. Accordingly;
  - Projected growth by year **2030 = 26.5MtCO_2e/year**.
  - 2018 assessment indicates an emission figure of **32.4MtCO_2**.
  - Nigeria surpassed the predicted figure for 2030 emissions projection, 12 years earlier.


Forest and Biodiversity Loss
Agricultural expansion
Logging & wood extraction for energy
Infrastructure development
Mining and Quarrying
Overharvesting of wildlife
DIRECT or PROXIMATE DRIVERS
Policy & Legal framework
·Inconsistencies
·Rent seeking
Socio-economic
·Poverty, culture, demand,
·low employment opportunities
·Insecure land tenure
Demographic
·Population growth
·Population density
·urbanization
Institutional
·Poor funding
·Low staffing levels
·Poor coordination
Environmental
·Climate variability
UNDERLYING DRIVERS

Ecosystem

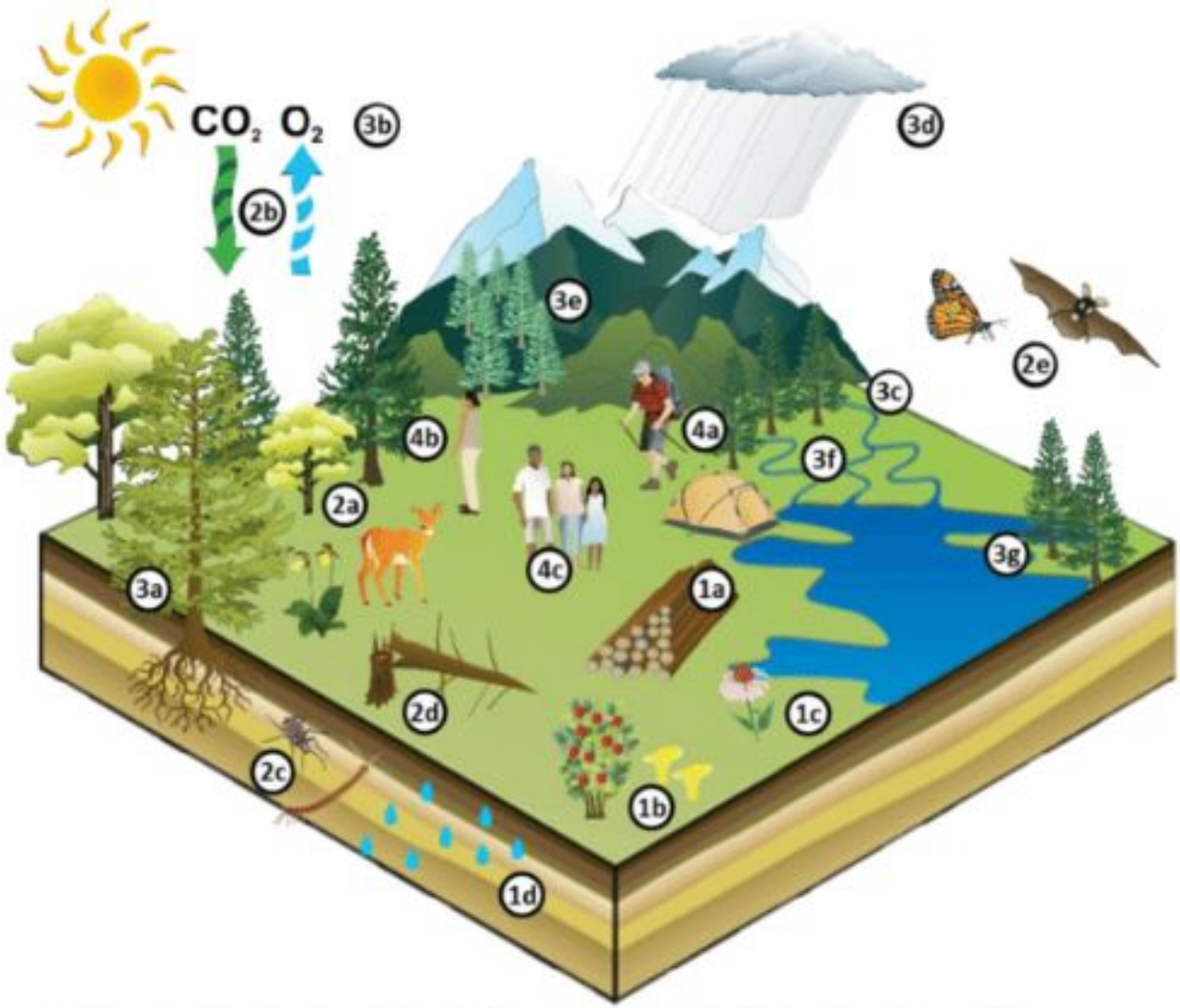




- Consists of all the organisms and the physical environment with which they interact.
- These biotic and abiotic components are linked together through nutrient cycles and energy flows.
- This reaction brings forth structural and functional changes in a community.

Ecosystem Services

- Ecosystem goods and services, often shortened to ecosystem services (ES), are the direct and indirect contributions ecosystems (known as natural capital) provide for human wellbeing and quality of life.
- These benefits underpin almost every aspect of human well-being.
- Some of these ecosystem services are well known; others are not well known.
- Yet, many of the decisions we make impact the provision of ES.



Symbols courtesy of the Integration and Application Network, University of Maryland Center for Environmental Science (ian.umces.edu/symbols/)

Ecosystem services of forests

1. **Provisioning Services**
   a. Timber/Fibre (construction, energy)
   b. Food (deer, fruits, herbs, seeds, honey)
   c. Chemical and medicinal products
   d. Water

2. **Supporting Services**
   a. Habitats for fauna and flora (biodiversity)
   b. Photosynthesis/Primary production
   c. Soil formation
   d. Nutrient cycling
   e. Pollination, seed dispersal

3. **Regulating Services**
   a. Carbon storage (above/below ground)
   b. Purification of air
   c. Purification of water
   d. Climate regulation
   e. Protection against erosion/ avalanches
   f. Flood mitigation
   g. Protection against coastal erosion and storms

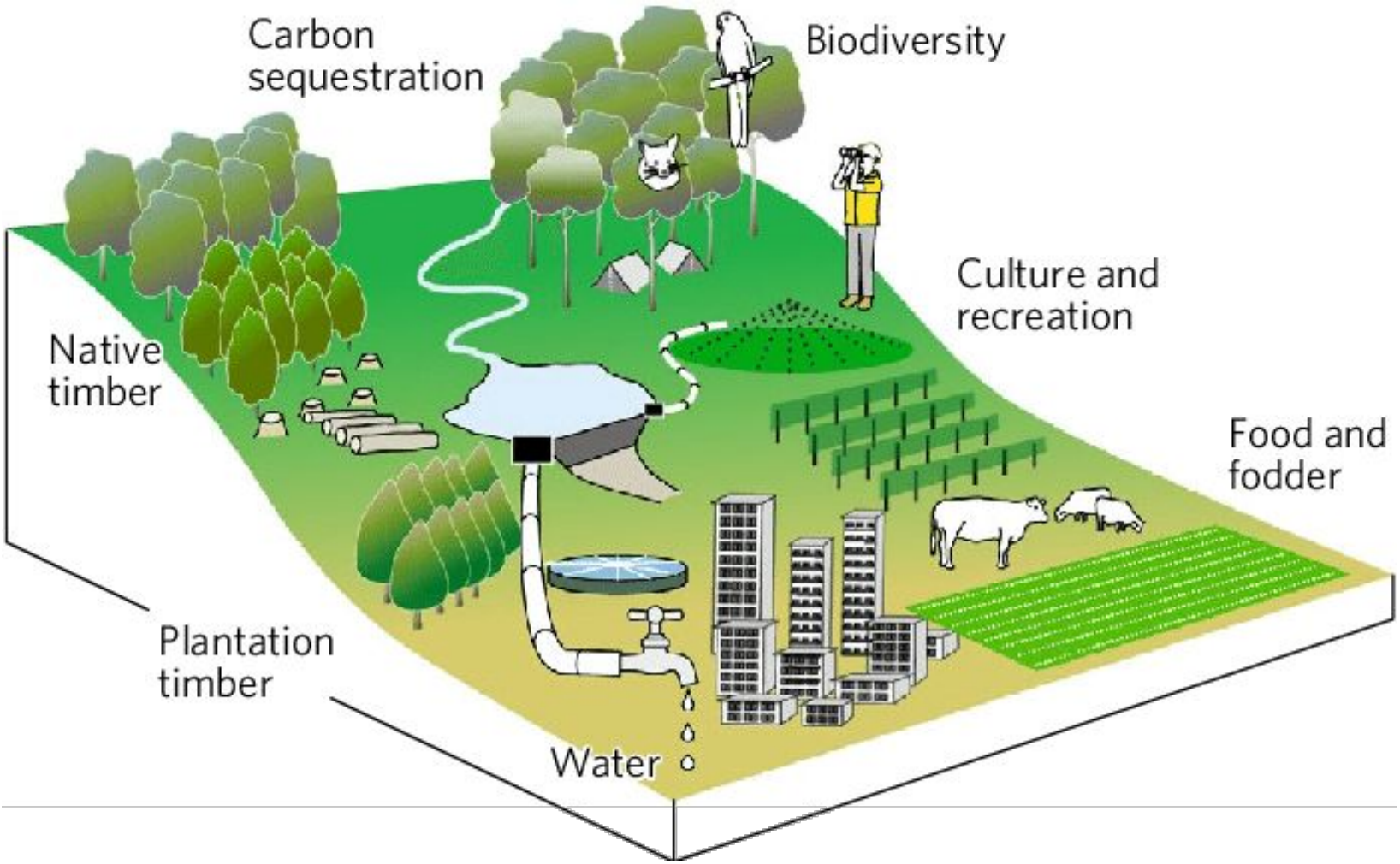
4. **Cultural Services**
   a. Recreation/Aesthetics
   b. Spirituality
   c. Education

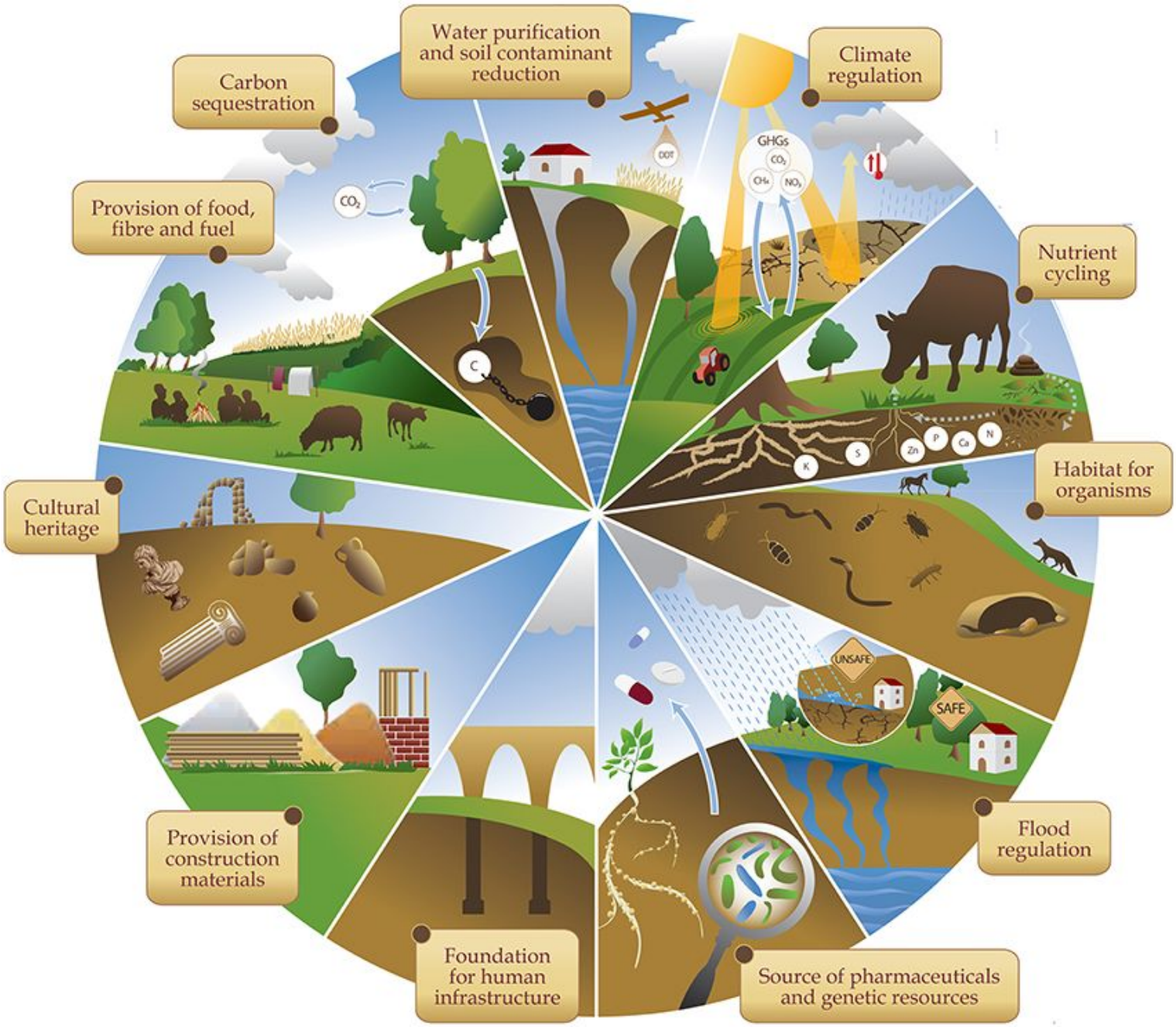
Ecosystem Service Valuation

- Ecosystem service valuation is a process that quantifies the economic benefits of nature for inclusion in decision-making at scales from local to global.
- Economic valuation attempts to elicit public preferences for changes in the state of the environment in monetary terms.
- Ecosystems have value because:
  - They maintain life on Earth; and
  - They maintain the services needed to satisfy human material and nonmaterial needs.

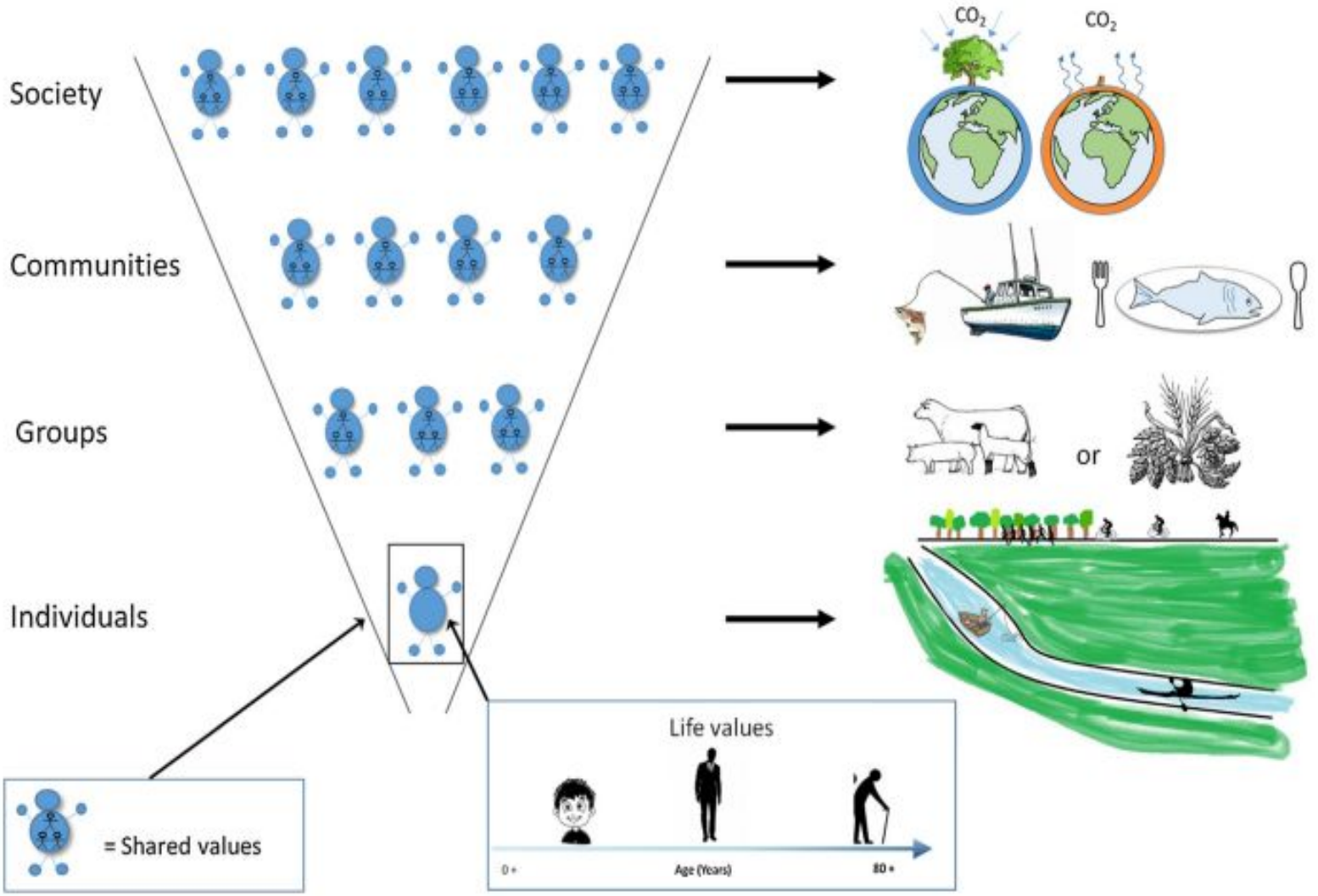
Let's Think Differently

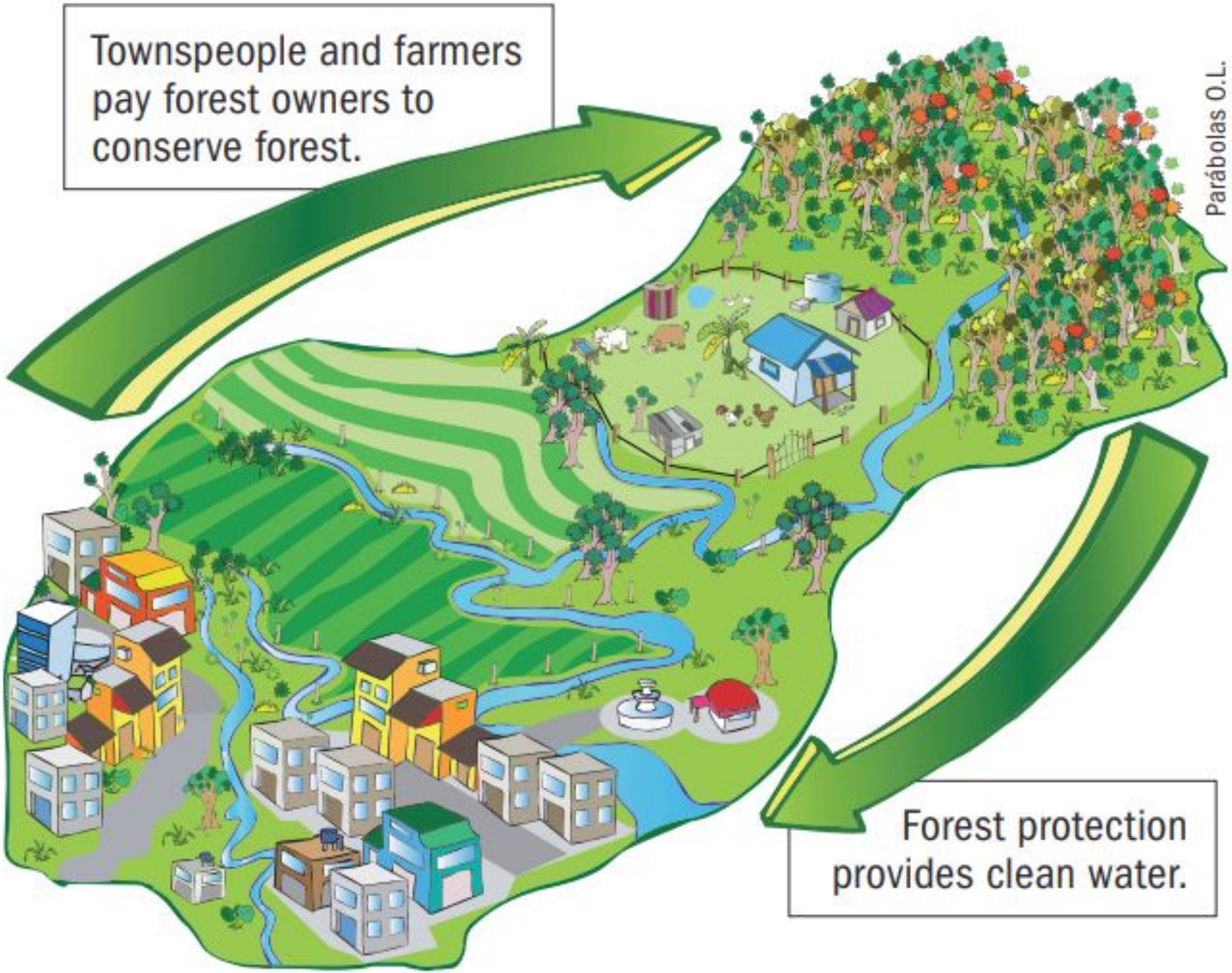
Landscape Context of Ecosystem Assets & Services




Water purification and soil contaminant reduction
Climate regulation
Carbon sequestration
Provision of food, fibre and fuel
Nutrient cycling
Cultural heritage
Habitat for organisms
Provision of construction materials
Flood regulation
Foundation for human infrastructure
Source of pharmaceuticals and genetic resources
GHGs
UNSAFE
SAFE

Individual and shared values at different levels of organisation

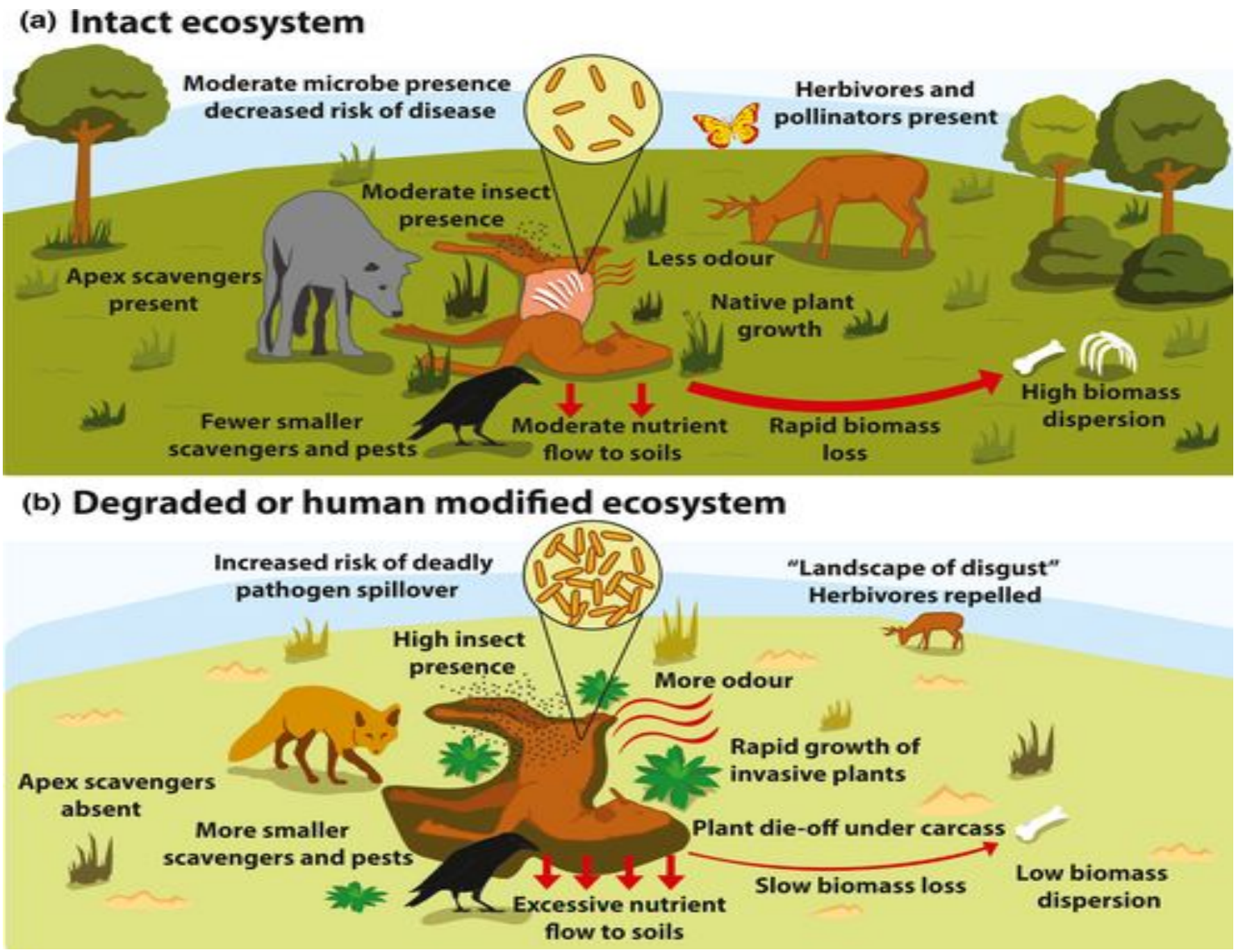



Townspeople and farmers pay forest owners to conserve forest.
Forest protection provides clean water.
Parábolas O.L.

Principles for Ecosystem Services Valuation

- Valuation should be a neutral analytical tool, not an advocacy instrument.
- Valuation should be solution-based.
- Promote sustainability by showing that the sustainable use of the ecosystems has a positive economic value, which can be higher than the value of alternative resource uses which threaten it.
- Increase knowledge base of the range of monetary values associated with ecosystems.
- Intentional to influence decision-making/policies: It is expected that a proper valuation should be able to change government perceptions on ecosystems and, consequently, to influence decisions enabling a more judicious use of nature.

- Without influencing decisions, ecosystem services valuation might just be a waste of time and resources.
- Ecosystem services contribute to economic welfare in two ways:
  - through contributions to the generation of income and wellbeing; and
  - through the prevention of damages that inflict costs on society.
- Both types of benefits should be accounted for in policy appraisal.
- With a broader focus on valuing benefits from ecosystems, policy options that enhance the natural environment are also more likely to be considered that demonstrate that investing in natural capital can make economic sense.


(a) Intact ecosystem
Moderate microbe presence
decreased risk of disease
Herbivores and
pollinators present
Moderate insect
presence
Less odour
Apex scavengers
present
Native plant
growth
High biomass
dispersion
Fewer smaller
scavengers and pests
Moderate nutrient
flow to soils
Rapid biomass
loss
(b) Degraded or human modified ecosystem
Increased risk of deadly
pathogen spillover
"Landscape of disgust"
Herbivores repelled
High insect
presence
More odour
Rapid growth of
invasive plants
Apex scavengers
absent
More smaller
scavengers and pests
Plant die-off under carcass
Slow biomass loss
Low biomass
dispersion
Excessive nutrient
flow to soils


Let’s act now to save us all.
Thank you!