United Nations
Office for Sustainable Development

**TECHNOLOGY**
FACILITATION MECHANISM

SUSTAINABLE
DEVELOPMENT
G⊕ALS

Workshop on Science, Technology and Innovation for SDGs 2017

# STI for preserving and sustainably using terrestrial ecosystems (SDG 15)

Nov. 29, 2017

Wooyeong Joo

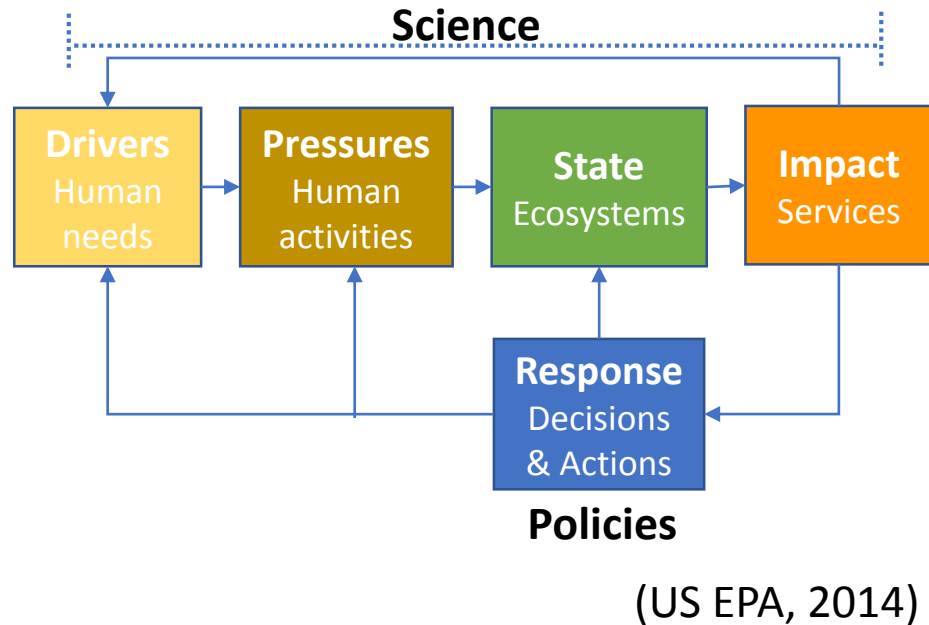National Institute of Ecology

ECORIUM

# SUSTAINABLE DEVELOPMENT GOAL 15

- **Protect, restore** and promote sustainable use of **terrestrial ecosystems**, sustainably **manage forests**, combat desertification, and halt and reverse land degradation and halt biodiversity loss
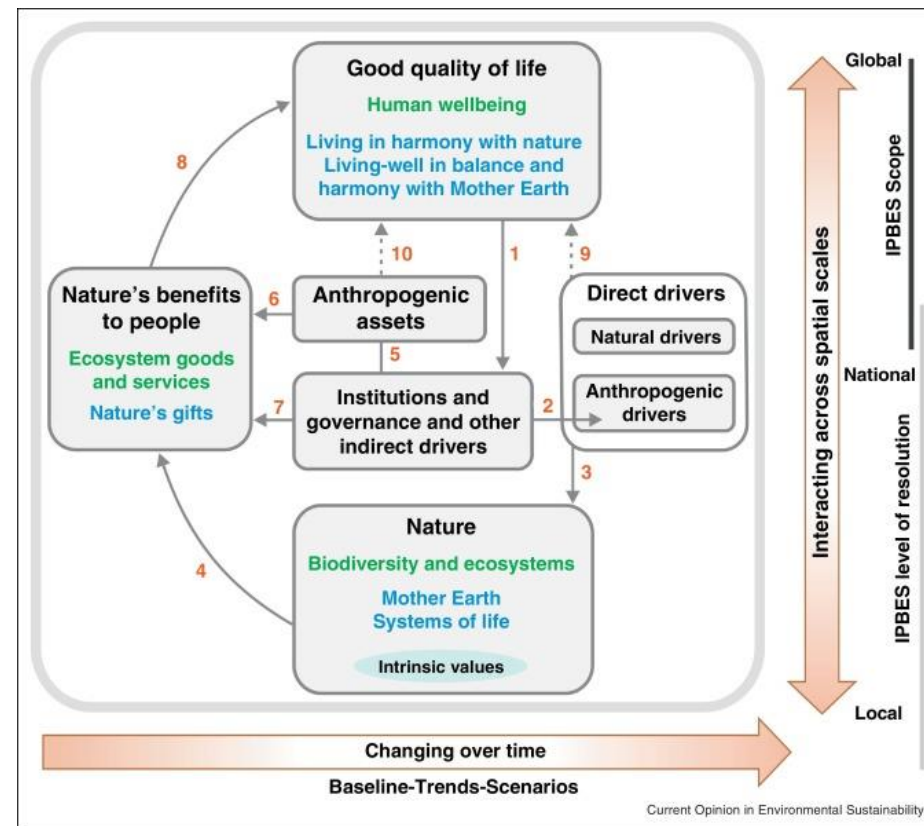
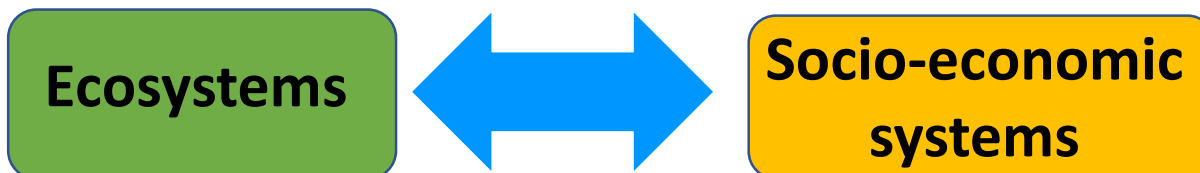| Targets | Indicators |
|---|---|
| **15.1:** By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems | **15.1.1:** Forest area as % of total land area<br>**15.1.2:** % of protected areas for terrestrial and freshwater biodiversity |
| **15.5:** Take significant action to reduce the degradation of habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species | **15.5.1:** Red List Index |
| **15.9**<br>By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts | **15.9.1**<br>Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020 |

# WHY TO USE INDICATOR FRAMEWORK?
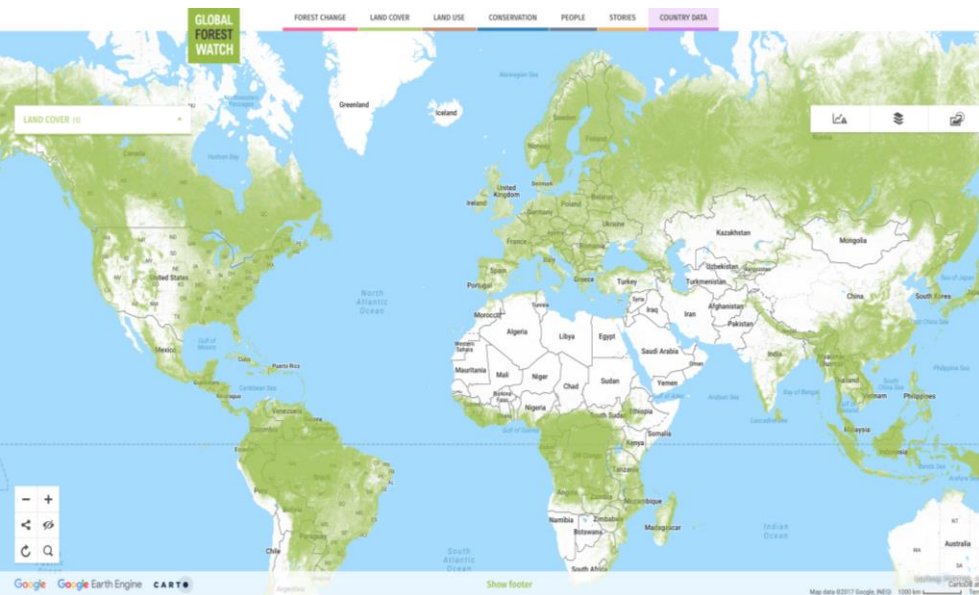
- ## DPSIR indicator Model
- ## IPBES Conceptual Framework



(US EPA, 2014)

(Diaz et al., 2015)

**Ecosystems** ⬌ **Socio-economic systems**

# SDG 15.1.1 FOREST AREAS

# SDG 15.1.2 PROTECTED AREAS



Protected Areas of the world

protected planet

Source: IUCN and UNEP-WCMC (2016). The World Database on Protected Areas (WDPA) [On-line], December 2016, Cambridge, UK: UNEP-WCMC. Available at www.protectedplanet.net

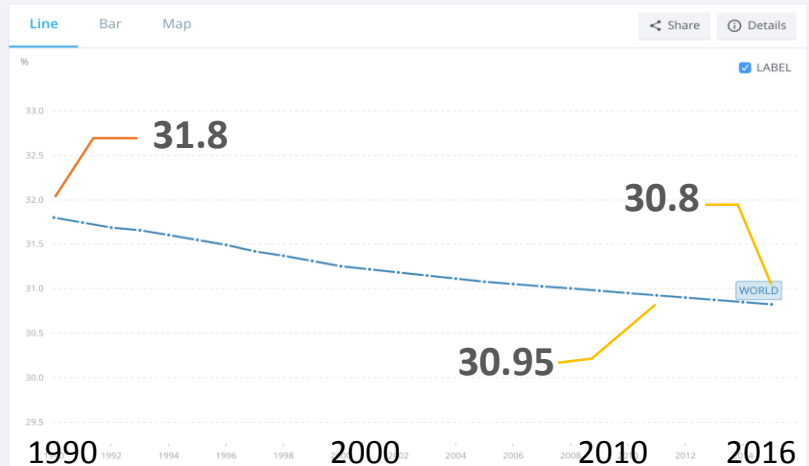Terrestrial protected areas    Marine and coastal protected areas

THE WORLD BANK | Data
IBRD · IDA

## Forest area (% of land area)

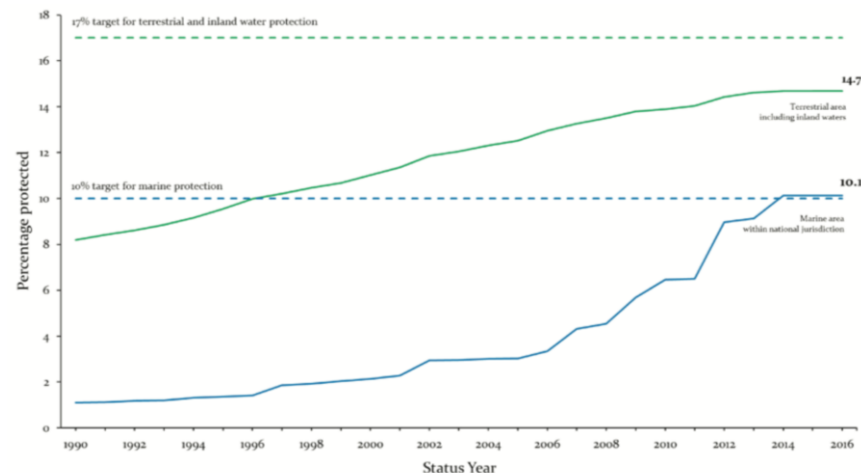Food and Agriculture Organization, electronic files and web site.
License: Open

Line    Bar    Map        Share    Details



| Type | Protected area Coverage(%) | | Changes in PAs |
|------|------|------|------|
| | 2010 | 2016 | |
| **Terrestrial Pas** | **12.7 %** | **14.8%** | **2.7M km2** |
| **Marine Pas** | **4.0 %** | **12.7%** | |

# CHANGE IN GLOBAL FOREST AREA (FROM 2001 ~ 2016)

# SDG 15.5.1: RED LIST INDEX

| Vertebrates | # of threatened species | | | % of threatened species |
|---|---|---|---|---|
| | 1996 | 2010 | 2017 | |
| Mammals | 1,096 | 1,131 | 1,196 | 25% |
| Birds | 1,107 | 1,240 | 1,460 | 13% |
| Reptiles | 253 | 594 | 1,185 | - |
| Amphibians | 124 | 1,898 | 2,100 | 42% |
| Fishes | 734 | 1,851 | 2,371 | - |
| Total | 3,314 | 6,714 | 8,312 | - |
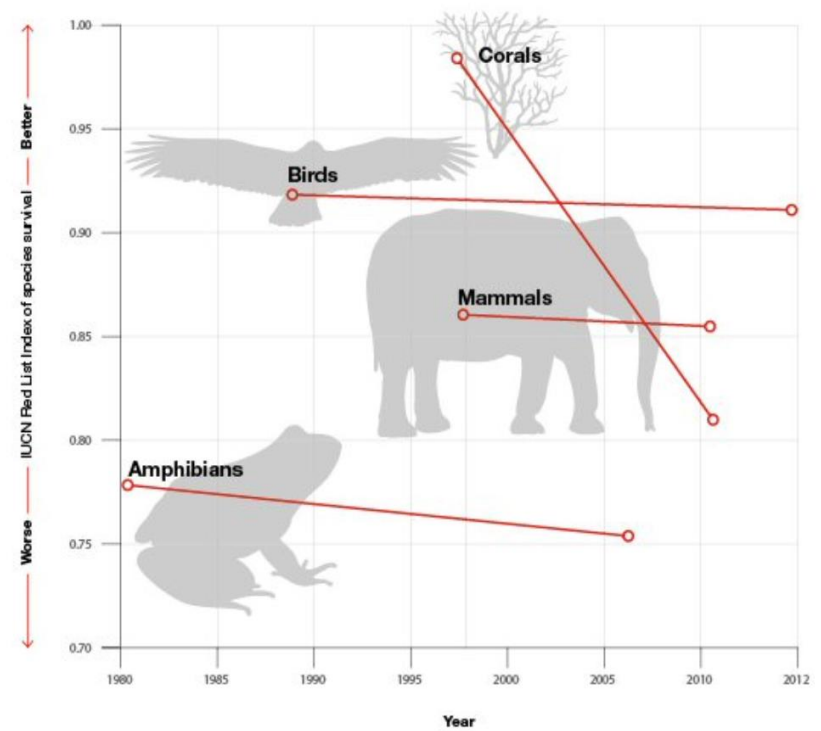


(IUCN Red List, 2017)

# HABITAT INTACTNESS INDEX
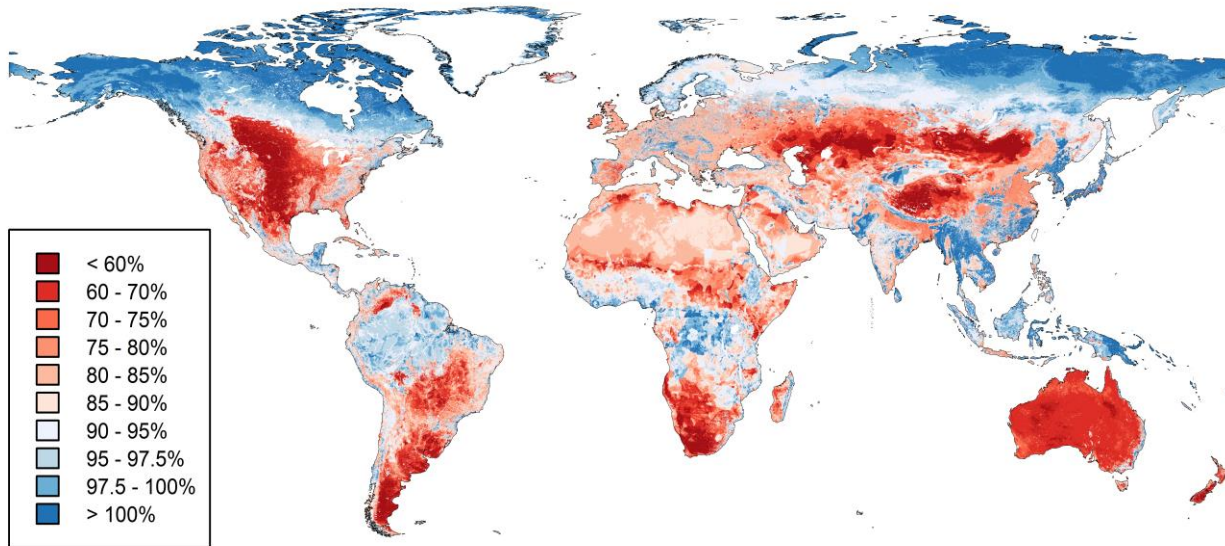
# 15.9.1: PROGRESS TOWARDS NBSAP ESTABLISHED (AICHI TARGET 2)

## NBSAP submitted to CBD



**NBSAP Status**

- NBSAPs (post–Nagoya) 149
- NBSAPs (total) 185
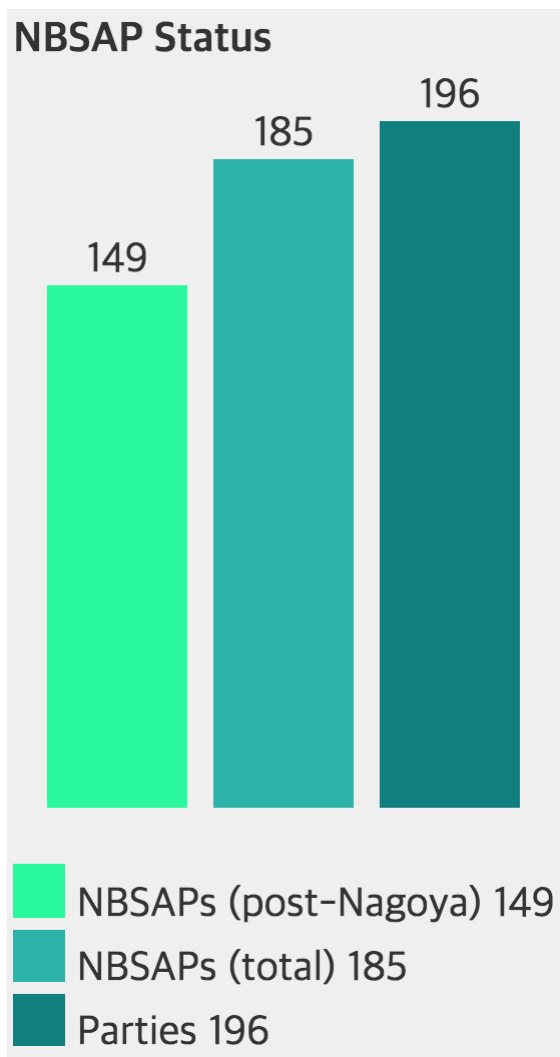- Parties 196

## NR submitted to CBD



**NR Status**

- 151 NR1 Received
- 137 NR2 Received
- 153 NR3 Received
- 179 NR4 Received
- 188 NR5 Received
- 196 CBD Parties
- 198 Countries
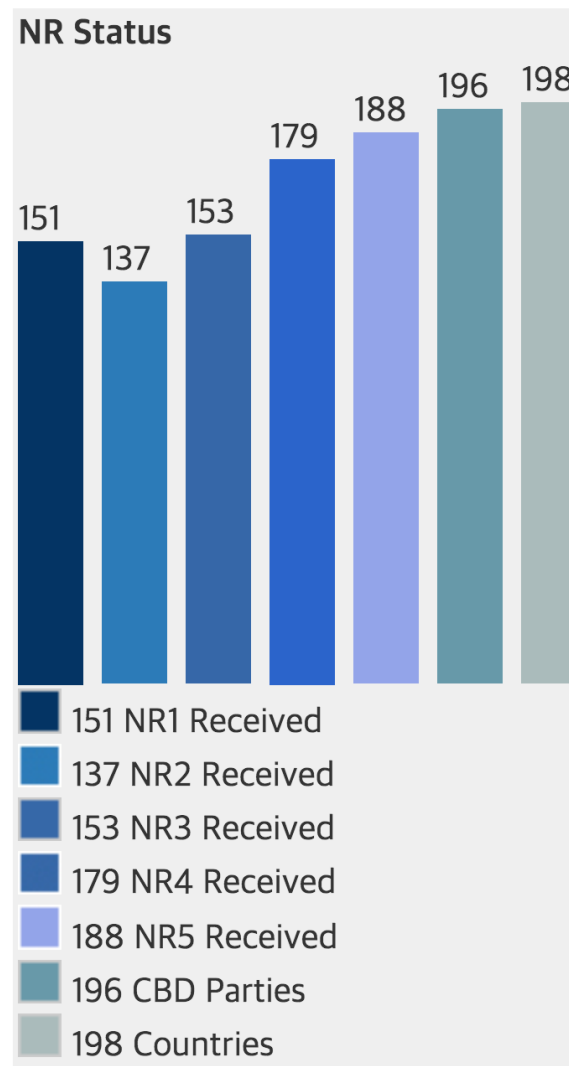
# Three recommendations

- Developing intuitive and informative indicators to better communicate with policy decision makers and multilateral stakeholders

- Developing and advancing Scenarios & modeling methodology to provide information of future changes in ecosystems for policy support

- Reducing knowledge gaps and information bias between countries and regions

# Ecological Footprint

## 1.7 Earths

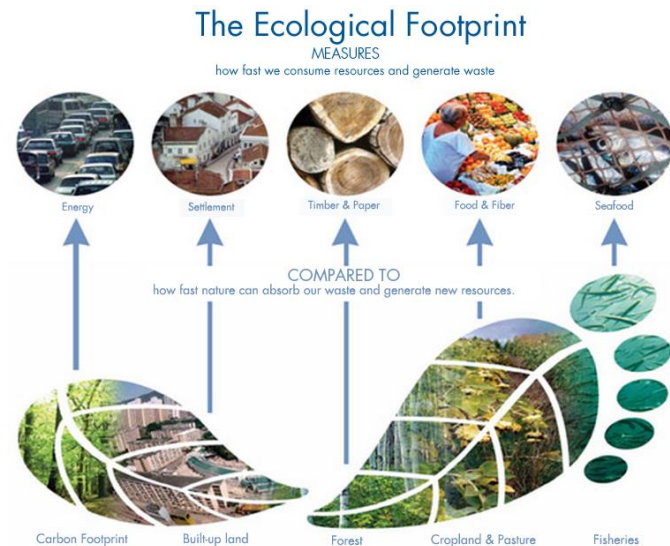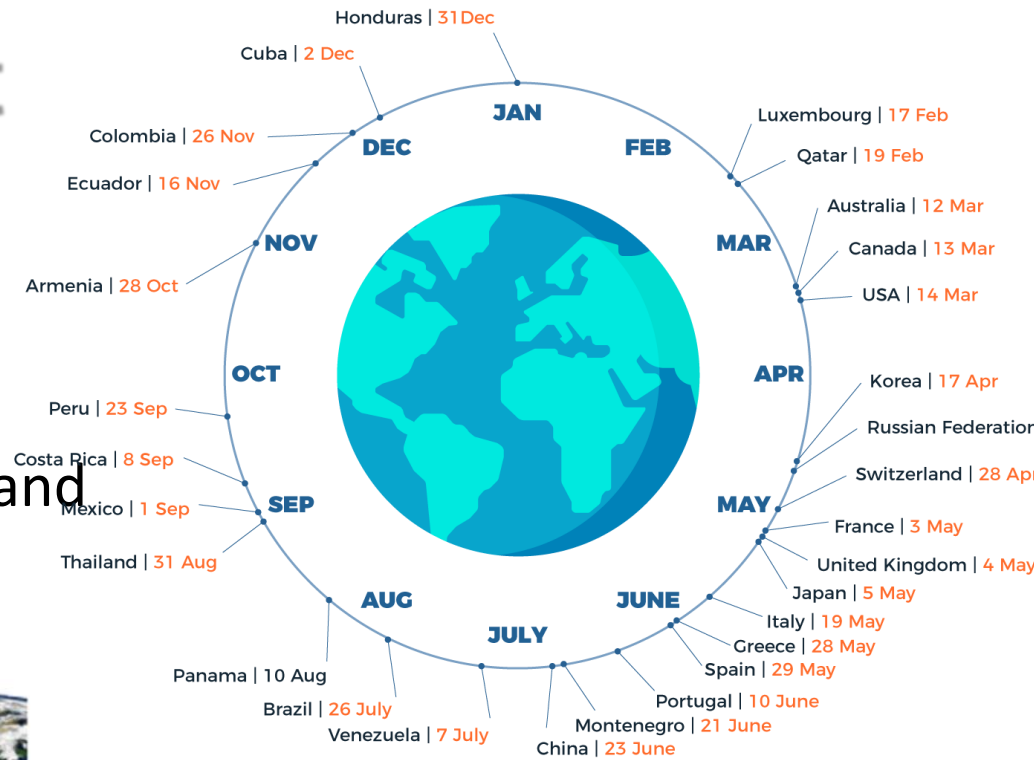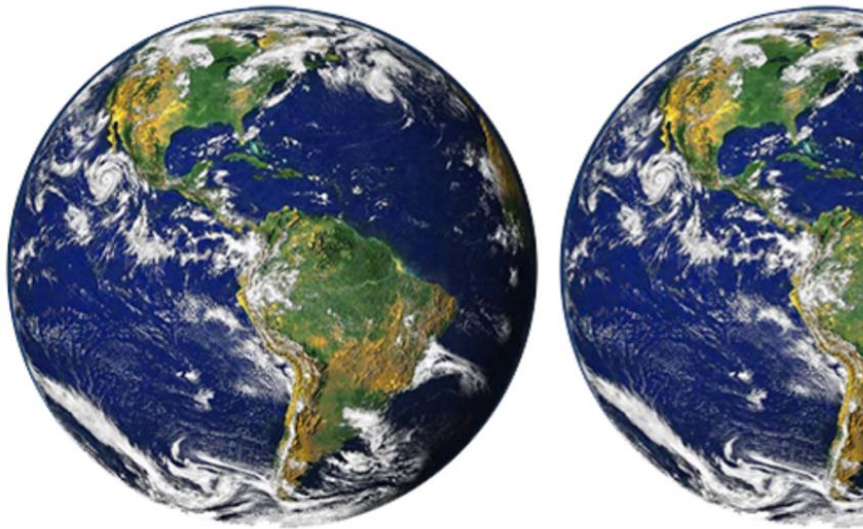Needed to support human's demand on Earth's ecosystems



Honduras | 31 Dec
Cuba | 2 Dec
JAN
Colombia | 26 Nov
DEC
FEB
Luxembourg | 17 Feb
Qatar | 19 Feb
Ecuador | 16 Nov
Australia | 12 Mar
MAR
Canada | 13 Mar
NOV
Armenia | 28 Oct
USA | 14 Mar
OCT
APR
Korea | 17 Apr
Peru | 23 Sep
Russian Federation
Costa Rica | 8 Sep
Switzerland | 28 Apr
Mexico | 1 Sep
SEP
MAY
France | 3 May
Thailand | 31 Aug
United Kingdom | 4 May
Japan | 5 May
AUG
JUNE
Italy | 19 May
JULY
Greece | 28 May
Panama | 10 Aug
Spain | 29 May
Brazil | 26 July
Portugal | 10 June
Venezuela | 7 July
Montenegro | 21 June
China | 23 June

## The Ecological Footprint

MEASURES
how fast we consume resources and generate waste

Energy     Settlement     Timber & Paper     Food & Fiber     Seafood

COMPARED TO
how fast nature can absorb our waste and generate new resources.

Carbon Footprint     Built-up land     Forest     Cropland & Pasture     Fisheries

Global Footprint Network, 2017
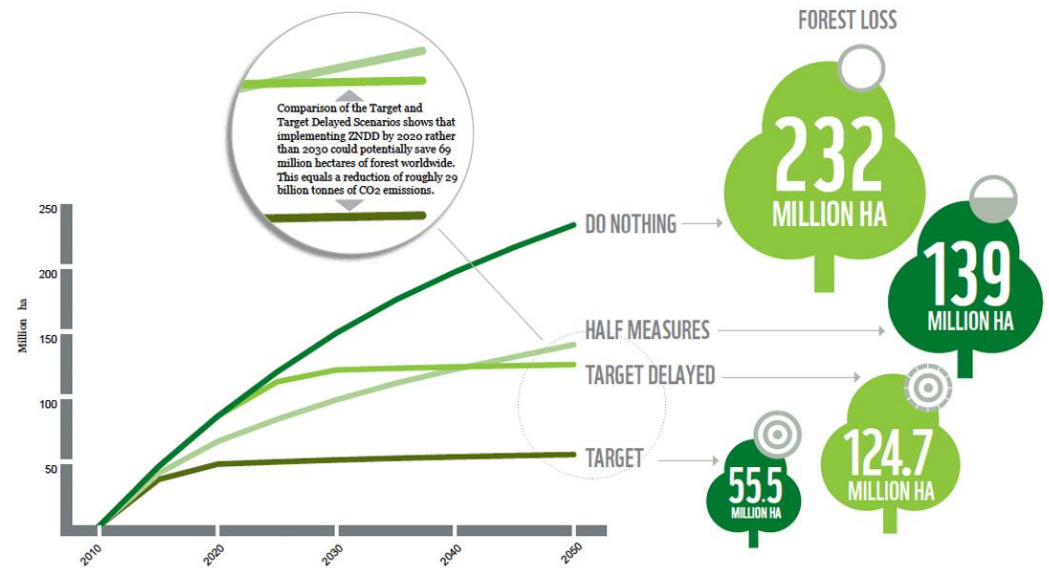
# To support policy and decision making

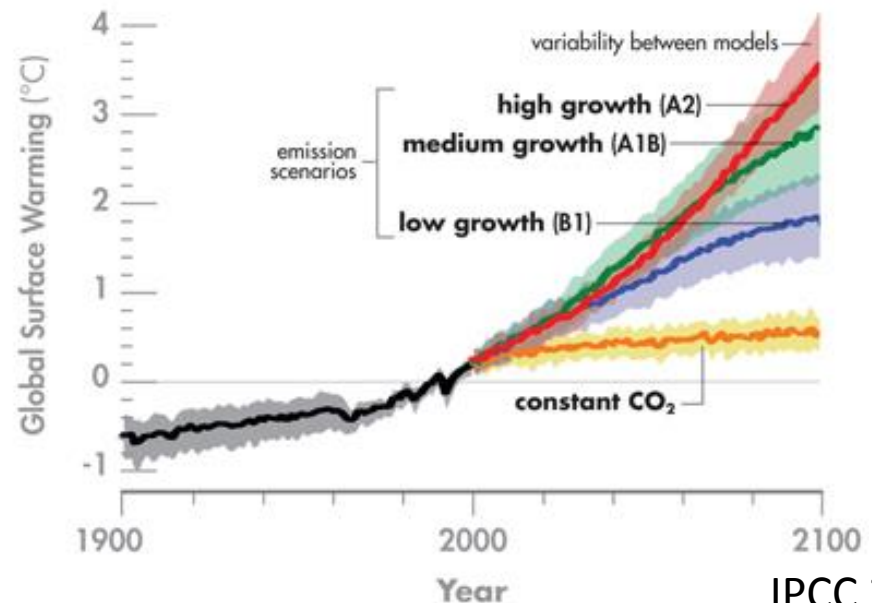by providing prediction of future changes in biodiversity and ecosystems
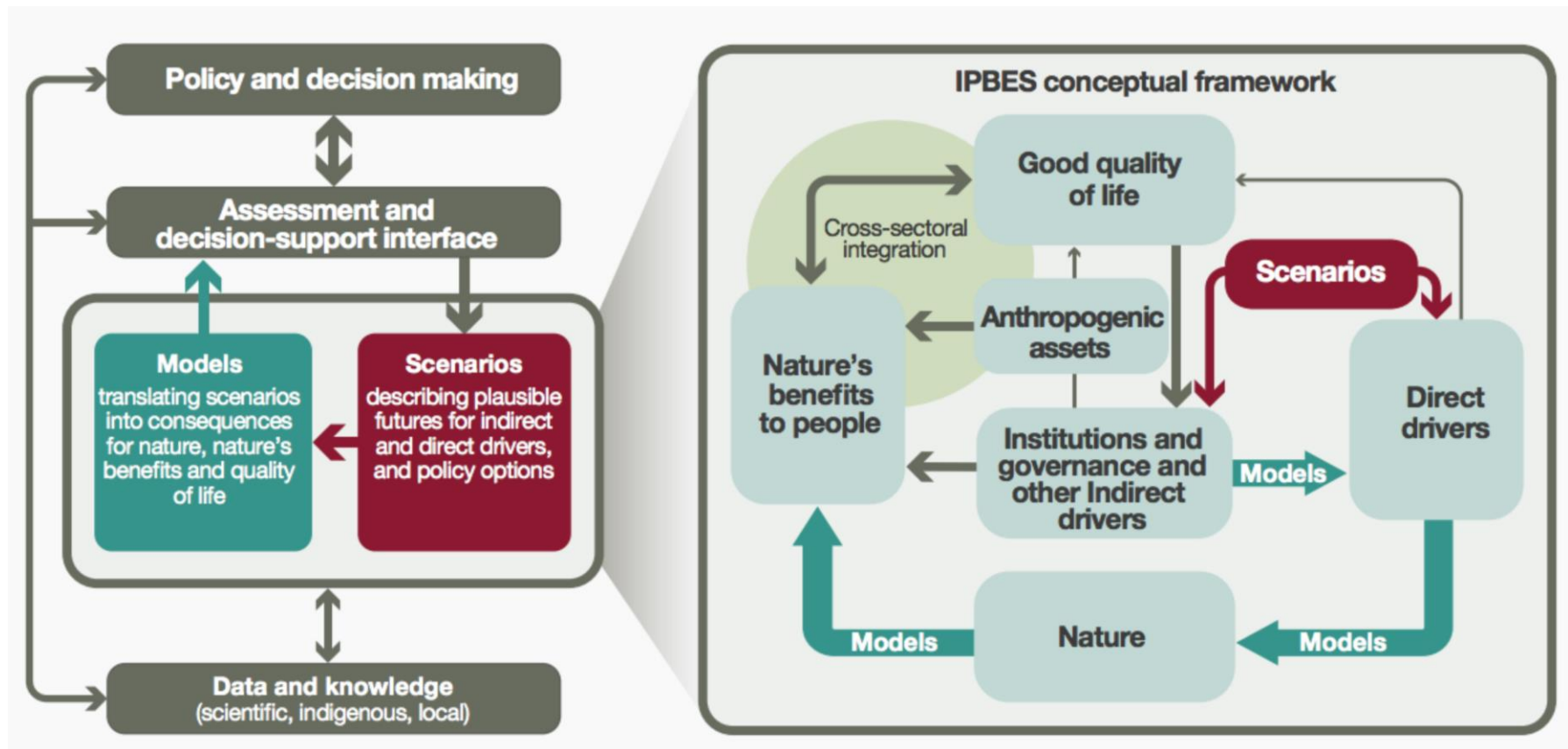
# Scenario & Modeling to predict the changes in biodiversity and ecosystem services

This figure shows cumulative deforestation between 2010 and 2050. Under the Do Nothing Scenario, the area deforested is greater than the current total forest area of the Democratic Republic of Congo, Peru and Papua New Guinea combined.

FOREST LOSS

Comparison of the Target and Target Delayed Scenarios shows that implementing ZNDD by 2020 rather than 2030 could potentially save 69 million hectares of forest worldwide. This equals a reduction of roughly 29 billion tonnes of CO2 emissions.

DO NOTHING — 232 MILLION HA

HALF MEASURES — 139 MILLION HA

TARGET DELAYED — 124.7 MILLION HA

TARGET — 55.5 MILLION HA

http://wwf.panda.org/

variability between models

high growth (A2)
medium growth (A1B)

emission scenarios

low growth (B1)

constant $CO_2$

IPCC 2007

# Density of Biodiversity data (by GBIF)

(IPBES 2016)

# "Deforestation Fronts"
- 80% of deforestation likely to happen in 20 years

(WWF 2017)



Global Biodiversity Information Facility (GBIF) density

Number of species records in 30 arcminute grid cells

Water background | 0 | 1 | 10 | 100 | 1000 | 10,000 | 100,000



Amazon | Borneo & Sumatra | Africa | Greater Mekong | New Guinea | Australia

# 15.b. Finance sustainable forest management and provide adequate incentives for conservation and reforestation

# TIME SCHEDULE IN CONVENTION ON BIOLOGICAL DIVERSITY (CBD)

## 2018

IPBES
Regional Assessment
(March, 2018)

CBD
COP 14 – Nov. 22

6th National Report submitted by Parties

## 2019

IPBES
Global Assessment
(March 2019)

Global Biodiversity
Outlook -5 draft
(public review)

## 2020

GBO – 5 published
(June 2020)

CBD COP 15
(Oct. 2020)

- Post Biodiversity
  Strategies 2011-
  2020

Thank you!
감사합니다.

생명사랑, 다양성, 창발, 멋