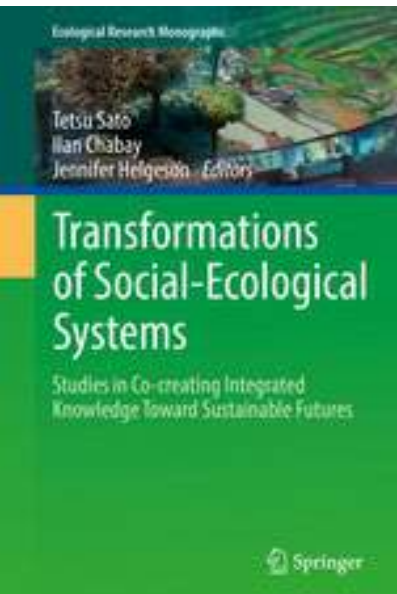


# UNESCO Biosphere Reserves, SDGs and “OECM”

- Keywords: Sustainable development, SDGs, OECM, Nature-positive, Coexistence of People and Nature,



**Hiroyuki Matsuda**  
**Yokohama National Univ.**

*JBRN=Japanese BR Network*

# Pre-lecture exercise (optional)

- exercise 1: Describe what Biosphere Reserves are in about 50 words, referring to the following site and others ([html](#))
- exercise 2: Describe what SDGs are in about 50 words, referring to the following site and others ([html](#))
- exercise 3: Describe what OECMs are in about 50 words, referring to the following site and others ([html](#))
- exercise 4: Watch the following video (46minutes) 'Good practices of SDGs in BRs, "Our Biosphere, Our Future"' by Miguel Clusener-Godt ([HTML](#))

# “Environmental Risk Management for Infrastructure

## 1. SDGs and UNESCO’s Man and the Biosphere

Programme [ppt](#) video

## 2. World Heritages, Biosphere Reserves and Geoparks [220413ppt](#)\*

- History of MAB and WNBR over the past 50 years (English version only)  
[pdf](#) [video](#)(35’)

## 3. 4.\* Student presentations on BR or protected area of interest.

## 5. Good practices of SDGs in BR, “Our Biosphere, Our Future ”. ([HTML](#)\* 46’)

## 6. Payments for ecosystem services (PES) in BRs [video](#)\* (64’)

## 7. Branding and other uses of BR [video](#)\* (48’)

## 8. 9.\* Student presentations on good practices of SDGs in BR of interest.

## 10. Planetary Boundaries & Dasgupta Report “The economy of biodiversity” [video](#)\* (76’)

## 11. Education for Sustainable Development (ESD) using BRs #

## 12. 13.\* Student group presentations on ideas for BRs (ESD)

## 13. 14. Comments and discussion on student presentations #

## 15. Blue Carbon Ecosystems [video](#)\*. (36’)

## 16. History of UNESCO " [video](#) (35min.) [pdf](#)



# By HM



# Today topics

- World Heritage and Biosphere Reserves
- SDGs (Sustainable Development Goals)
- Ecosystem Services, Nature's Contributions to People
- 30by30 and OECM (Other Effective area-based Conservation Measures)
- Reaction to Pre-lecture exercise and further exercise



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in Biosphere Reserves for  
Sustainable Societies

Yokohama National University



United Nations  
Educational, Scientific and  
Cultural Organization



Man and  
the Biosphere  
programme



Sustainable  
Development  
Goals



unesco

Chair *Logo-use request in progress*

# Criteria for World Heritage

OUV=Outstanding Universal values. At least one of...

- i. a masterpiece of **human creative genius**;
  - ii. an important **interchange of human values**
  - iii. a unique or at least exceptional testimony to **a cultural tradition** or to a civilization
  - iv. an outstanding example of a type of **building, architectural** or technological ensemble or **landscape**
  - v. an outstanding example of a **traditional human settlement**, land-use, or sea-use or human interaction with the environment
  - vi. directly or tangibly associated with **events or living traditions**, with ideas, or with beliefs, with artistic and literary works
- 
- vii. superlative natural phenomena or areas of exceptional **natural beauty** and aesthetic importance;
  - viii. outstanding examples representing major stages of **earth's history**, including the record of life
  - ix. outstanding examples representing significant **on-going ecological and biological processes in the evolution**
  - x. the most important and significant natural habitats for in-situ conservation of **biological diversity**,



# Criteria for Biosphere Reserve

## Statutory Framework for BRs; Article 4. All of...

1. It should encompass a mosaic of ecological systems representative of major biogeographic regions, including a gradation of human interventions.
2. It should be of significance for biological diversity conservation.
3. provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale.
4. an appropriate size to serve the three functions of biosphere reserves, as set out in Article 3. [conservation, development, research]
5. ...these functions, through appropriate zonation, recognizing: (a) a legally constituted core area... (b) a buffer zone... surrounding ...the core area, (c) an outer transition area where sustainable resource management practices...
6. Organizational arrangements should be provided for the ...participation of ...inter alia public authorities, local communities and private interests...
7. In addition, provisions should be made for
  - a. mechanisms to manage human use and activities in the buffer zone(s);
  - b. a management policy or plan for the area as a biosphere reserve;
  - c. a designated authority or mechanism to implement this policy or plan;
  - d. programmes for research,



# Criteria for UG Geopark: all of...

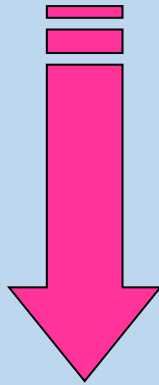
- i. must be ...**unified geographical areas** where ...international geological significance are managed
- ii. use that heritage... to promote **awareness of key issues facing society** in the context of the dynamic planet ...
- iii. ...areas with a **management body** having legal existence recognized under national legislation...
- iv. In the case where an applying area **overlaps with another UNESCO designated site**, ...the request ...
- v. actively involve **local communities and indigenous peoples** as key stakeholders in the Geopark.
- vi. encouraged to **share their experience** ...within the **GGN**.
- vii. respect local and national **laws**...
- viii. These criteria are **verified through checklists [4 yrs]**...

# MAB vs. World Heritage

UNESCO

Legally protected  
Theory X

World Heritage  
Convention (1972-)

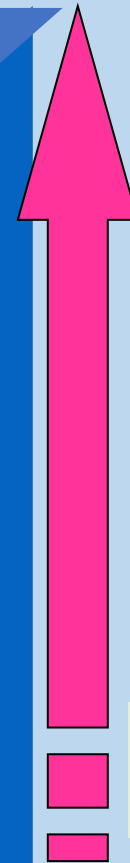


Protection of  
Outstanding Universal Value of  
Primeval nature

*Protection of the values*

*Creation of the values*

Model for Balance between  
Conservation and  
Sustainable use



MAB  
Programme (1971-)

Ramsar, Geopark

Soft-law except core  
Theory Y



# Theory X and Theory Y

by Douglas McGregor (1960s)



- Theory X = If you believe that your team members **dislike** their work and have little motivation, then, according to McGregor, you'll likely use an **authoritarian style** of management. This approach is very "hands-on" and usually involves micromanaging people's work to ensure that it gets done properly. [Environmentalists' spirit; WHC, Eco-labels]
- Theory Y = On the other hand, if you believe that your people take **pride** in their work and see it as a challenge, then you'll more likely adopt a **participative management style**. Managers who use this approach trust their people to take ownership of their work and do it effectively by themselves. [Educators' spirit; MAB]

<https://www.mindtools.com/adi3nc1/theory-x-and-theory-y>

<https://www.youtube.com/watch?app=desktop&v=9cgwkHel7Wo>

# Lockdown in COVID-19 in Japan

- Japan's "lockdown" was self-restraint with no penalties.
- Postwar Japan is characterized by self-restraint and self-responsibility that hesitates restricting individual actions than EU and USA.
- Japanese followed "lockdown" because "the others are doing it".
- Long-term self-restraint will be broken.



# Understanding the Role of Contracts in Japan

- The majority of Japanese companies has **little or no exposure to written contracts**. [According to the web site], more than 35% of Japanese companies have no experience with written contracts in the course of their business transactions. ...these data suggest that there are many Japanese SMEs who (a) simply do not prepare written contracts at all, or (b) sign written contracts blindly without properly reading them, or...

## Contracts a symbol for a relationship, not a tool to forge one

- These characteristics of Japanese business culture impact contract structure, too. As they emphasize harmony and trust, contracts become relatively **shorter**. For example, an average Japanese-style License Agreement is **four** pages long. In America, it is seven. [colored by H.M.]

# What's Your National Stereotype? Sinking Ship Joke



<https://prezi.com/0v7htifna5uz/sinking-ship-joke/>

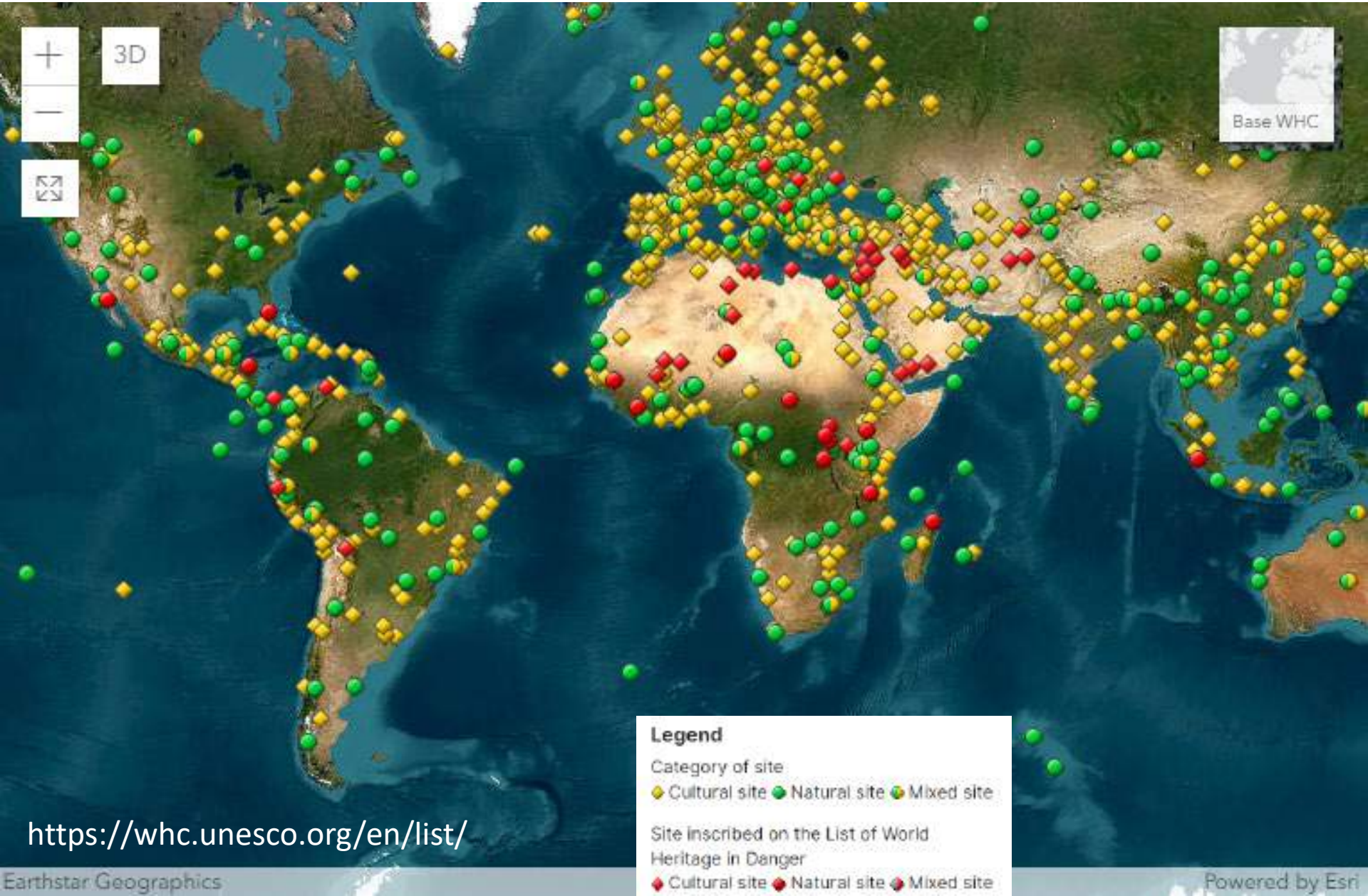
- On a luxury cruise ship, the Titanic, ... suddenly the ship ... begins to sink. Sadly, there aren't enough boats for all passengers. How will the captain persuade each man to jump into the sea?
- To the American... "If you jump, you'll be a **hero!**"
- To the Italian... "See beautiful **girls** are swimming"
- To the English... "... a **true gentleman** would jump."
- To the German... "According to the **regulations**, all the men must jump into the sea."
- To the French... "Please do NOT jump into the water."
- To the Japanese... "**Everyone else has already jumped.**"
- To the Thai... ???

# Quiz: How to Build Cooperative Relationships

1. It is better not for you to cheat first. **nice**
2. Those who can easily understand their own code of conduct will be outsmarted, so you should be regarded as **NOT too clever person**
3. Cooperation should not be unconditional. It is better to turn the other cheek when betrayed in order to gain cooperation. **“provocable”**
4. In order to maintain a cooperative relationship, it is **Long and “unknown end” partnership** to change partners periodically.
5. **Don't be envy** that opponents get more payoffs than yours.
6. Forgive partner's one cheating with one payback **“Forgiveness”**



World Heritage: 1157 (900+218+39 properties from 167 countries (43 trans-boudanry; 55 in danger) as of Aut. 2023



<https://whc.unesco.org/en/list/>

Biosphere Reserves BRs are ubiquitous around the world: the US is facing a series of recommendations to withdraw them, NZ does not...





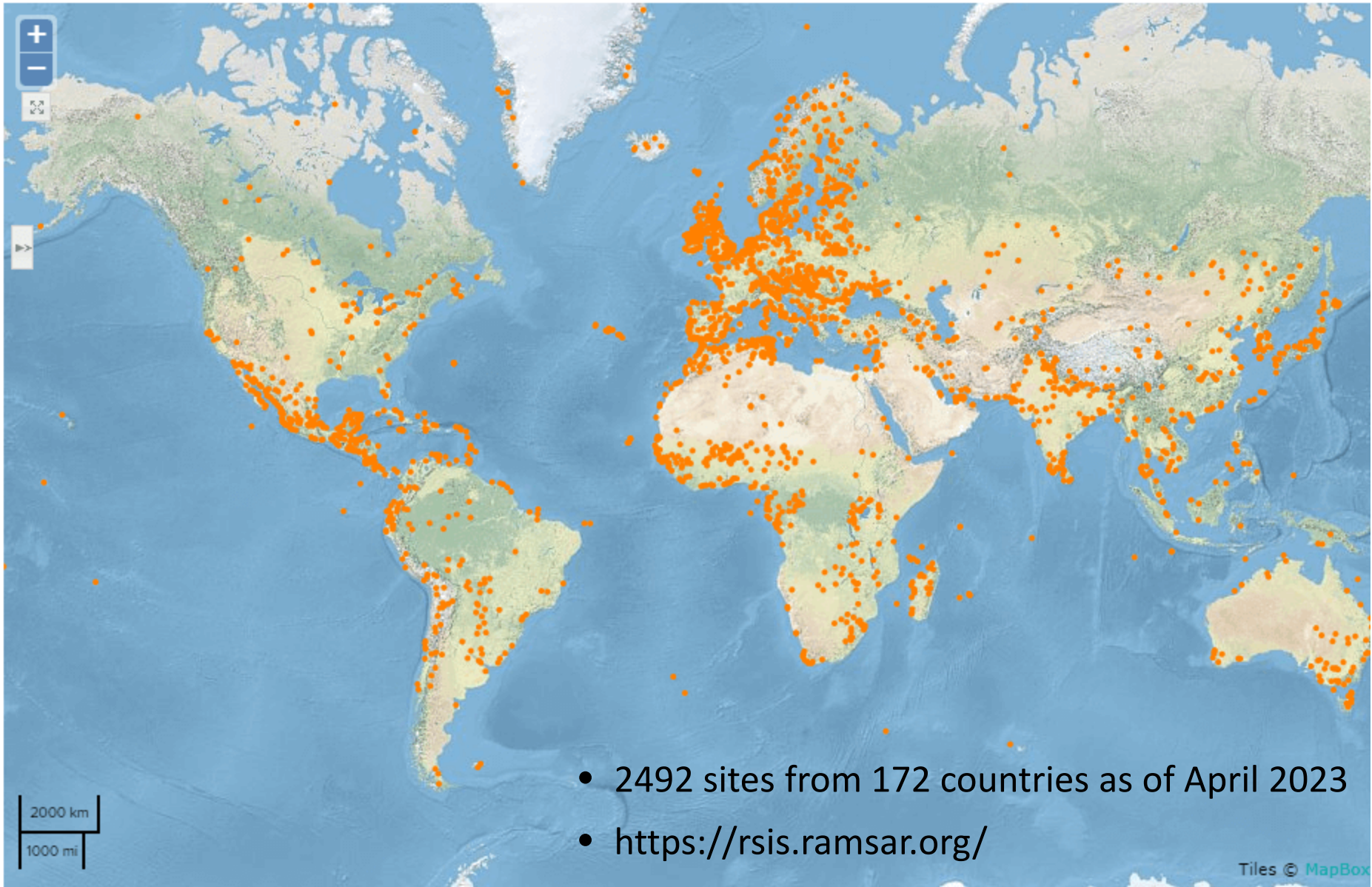
<https://en.unesco.org/global-geoparks/list>

UNESCO Global Geoparks - Calligraphy Park | Beijing, Shanxi, People's Republic of China

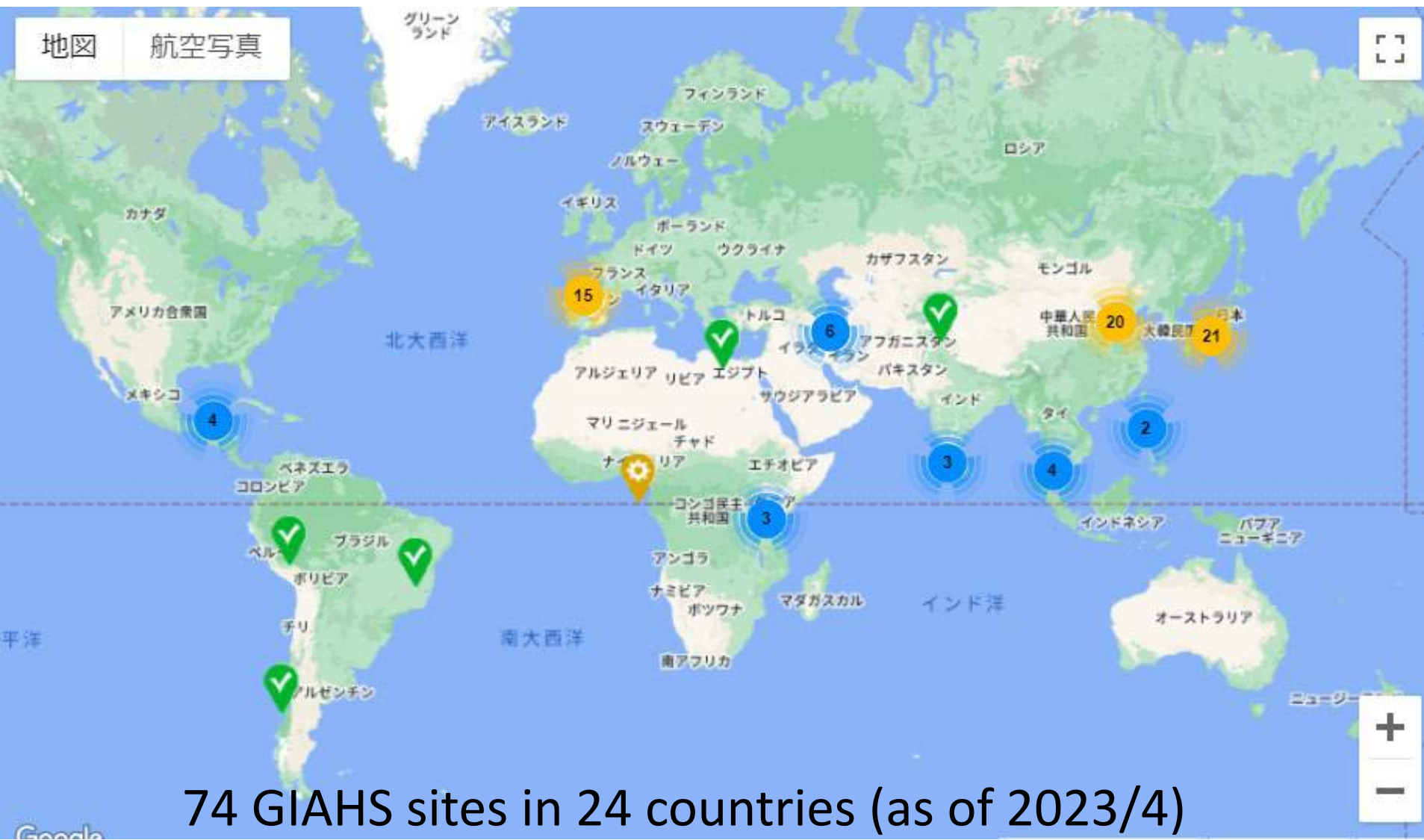
UNESCO Global Geopark	Country	UNESCO Global Geopark	Country	UNESCO Global Geopark	Country	UNESCO Global Geopark	Country	UNESCO Global Geopark	Country	UNESCO Global Geopark	Country	UNESCO Global Geopark	Country
1. Calligraphy Park	China	16. ...	China	31. ...	China	46. ...	China	61. ...	China	76. ...	China	91. ...	China
2. ...	China	17. ...	China	32. ...	China	47. ...	China	62. ...	China	77. ...	China	92. ...	China
3. ...	China	18. ...	China	33. ...	China	48. ...	China	63. ...	China	78. ...	China	93. ...	China
4. ...	China	19. ...	China	34. ...	China	49. ...	China	64. ...	China	79. ...	China	94. ...	China
5. ...	China	20. ...	China	35. ...	China	50. ...	China	65. ...	China	80. ...	China	95. ...	China
6. ...	China	21. ...	China	36. ...	China	51. ...	China	66. ...	China	81. ...	China	96. ...	China
7. ...	China	22. ...	China	37. ...	China	52. ...	China	67. ...	China	82. ...	China	97. ...	China
8. ...	China	23. ...	China	38. ...	China	53. ...	China	68. ...	China	83. ...	China	98. ...	China
9. ...	China	24. ...	China	39. ...	China	54. ...	China	69. ...	China	84. ...	China	99. ...	China
10. ...	China	25. ...	China	40. ...	China	55. ...	China	70. ...	China	85. ...	China	100. ...	China
11. ...	China	26. ...	China	41. ...	China	56. ...	China	71. ...	China	86. ...	China	101. ...	China
12. ...	China	27. ...	China	42. ...	China	57. ...	China	72. ...	China	87. ...	China	102. ...	China
13. ...	China	28. ...	China	43. ...	China	58. ...	China	73. ...	China	88. ...	China	103. ...	China
14. ...	China	29. ...	China	44. ...	China	59. ...	China	74. ...	China	89. ...	China	104. ...	China
15. ...	China	30. ...	China	45. ...	China	60. ...	China	75. ...	China	90. ...	China	105. ...	China



# Ramsar sites



>Half of GIAHS are in Japan and China. Fewer in Europe and the US.  
GIAHS = Globally Important Agricultural Heritage System (by FAO)



74 GIAHS sites in 24 countries (as of 2023/4)

<https://www.fao.org/giahs/giahsaroundtheworld/en/>

# The classical zonation of a Biosphere Reserve (UNESCO 2020)



Supporting conservation, sustainable local development, and provide research field.

Model for sustainable development

- **Core Areas** are legally strictly protected zones that are designed to ensure the conservation of landscapes, ecosystems, species and genetic variation.
- **Buffer Zones** should surround all Core Areas to buffer and reduce impacts. They also can serve conservation purposes, in particular if their valuable ecosystems depend on specific human intervention such as traditional farming or herding, landscape management etc. More generally, they are used for activities compatible with sound ecological practices that mutually reinforce with scientific research, monitoring, training and education.
- **Transition Areas** are those parts of a Biosphere Reserve, which should not be governed by additional regulation but through incentives and innovation, such that communities are empowered to conduct socio-culturally and ecologically sustainable activities, in particular truly Green Economies. Biosphere Reserves provide a lot of examples for 'Best Practices' and inspire all territories beyond their borders.

What is a Biosphere reserve

1) Conservation area

(Function as a protected area)

- Pristine nature
- Traditional culture against the backdrop of the local nature

+

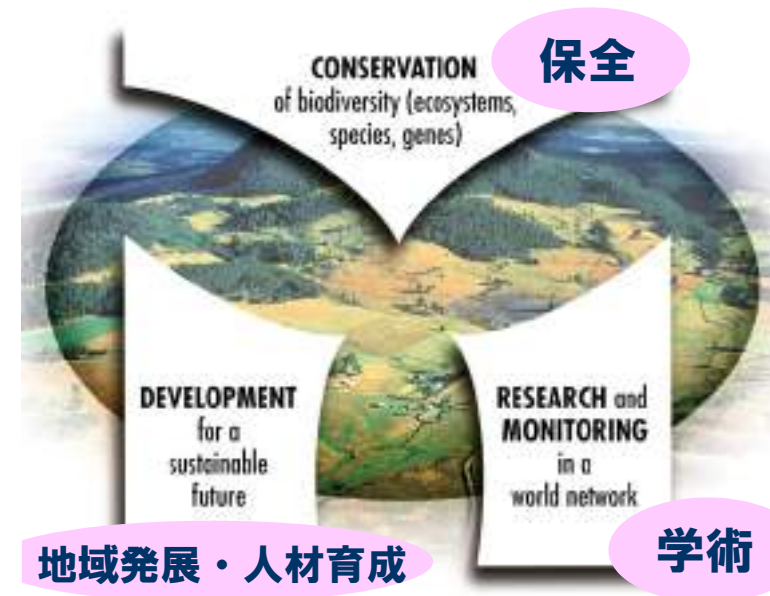
2) Learning Site (a place to explore how to live in harmony with nature)

- Social level

A place to explore and develop appropriate ways of interacting with the natural environment (social systems) and to provide information on how to apply these systems beyond the registered sites.

- Individual level

A place to learn about the natural environment, culture and how to create a sustainable society.





United Nations  
Educational, Scientific and  
Cultural Organization

# MEDIA SERVICES

Sobo-Katamuki-Okue  
BR (designated in 2017)



UNESCO » Media Services » Photos » MAB 2017

## For the Press

Press releases

Media advisories

Wide angle

## Multimedia

News Videos

**Photos**

Film and radio collection

## About us

Media contacts

What we do

## Photo gallery : World Network of Biosphere Reserves, of the Man and the Biosphere Programme (2017)



© UNESCO/Kyoko Shibuya, Hakusangawa River - Sobo, Katamuki and Okue Biosphere Reserve (Japan)

Members of the International Coordinating Council of the Man and the Biosphere (MAB) Programme will designate new biosphere

<http://www.unesco.org/new/en/media-services/multimedia/photos/mab-2017/>

# BRs fully respect people. People are rarely included in promotional photos for WHs and Geoparks.

World Heritage



UNESCO Global Geopark



Biosphere Reserve

651 UNESCO biosphere reserves  
Reservas de biosfera de UNESCO  
reservas de biosfera de UNESCO

120 countries  
países



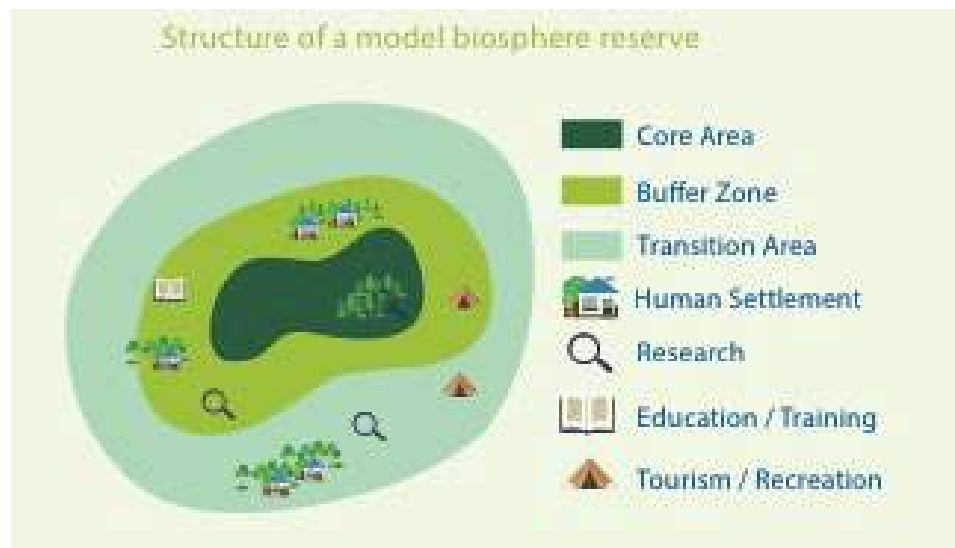
# Biosphere reserves: Three zones, three functions

They consist of three interrelated zones that aim to fulfil three complementary and mutually reinforcing functions:

- The **core area** comprises a strictly protected zone that contributes to the conservation of ecosystems, species and genetic variation.

- The **buffer zone** surrounds the core area. Is used for activities compatible with sound ecological practices that can reinforce scientific research, monitoring, training and education.

- The **transition area** is where communities foster socio-culturally and ecologically sustainable economic and human activities.



# Geopark/BR are not protected area, but models for sustainable development

- In 1971 [1976], UNESCO created the Man in Biosphere Programme which sought to reconcile **the use and conservation of natural resources**. It marked **the very first step towards** what we all know now as **sustainable development**.
- the definition as adopted November **2015** in UNESCO. (the definition of a UNESCO Global Geopark) is a **single, unified, geographical area** where sites and landscapes of international geological significance are managed with a **holistic concept of protection, education, and, most importantly, sustainable development**.

*Ramsar Convention... [wise use]*





# A FARM OF THE FUTURE

Ecosystem services previously taken for free could generate perhaps half the income of a farm, if markets for water credits take off as hoped. Farmlands in the future may have a diverse portfolio of ecosystem services to offer to

Mr.Ishuwaran

## BIODIVERSITY CREDITS

Conservation organizations are leasing development rights from the owners of undisturbed forests and other habitats that host threatened endemic species and fast-vanishing ecosystems.



## CO<sub>2</sub> OFFSET CREDITS

When landowners plant new forests and promise never to cut or burn the trees, they can receive carbon dioxide offset credits that industries will buy to help them comply with restrictions on greenhouse gas emissions.



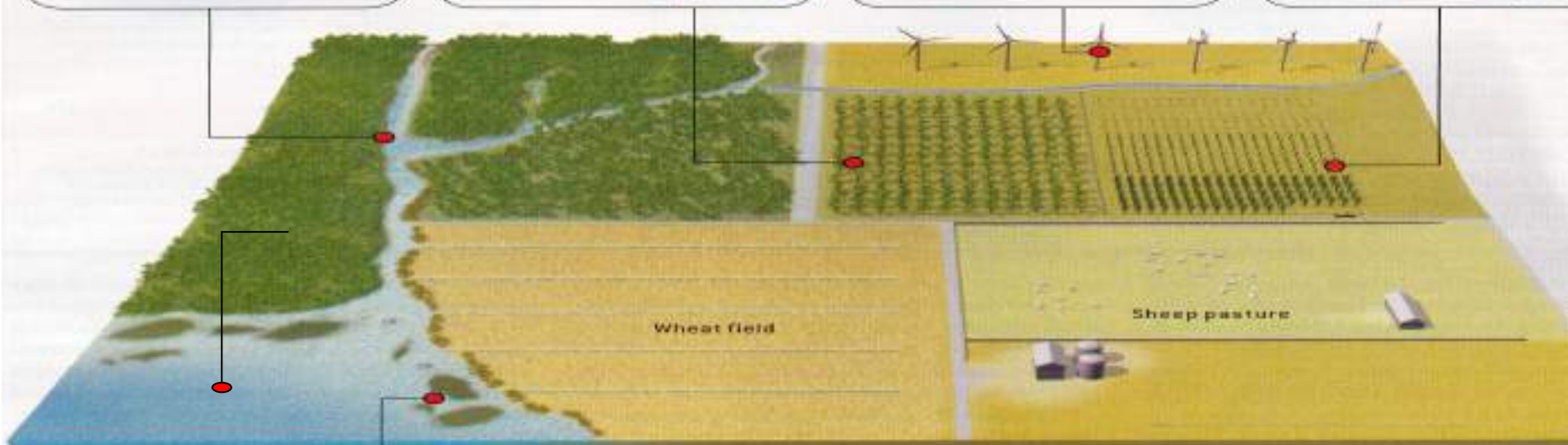
## RENEWABLE ELECTRICITY

Wind farms generate nonpolluting electricity that commands premium prices in deregulated power markets. The turbines can also garner tax credits that subsidize their capital and operating costs.



## CERTIFIED SUSTAINABLE TIMBER

Sustainably harvested timber is now one of numerous "eco-labeled" products that are certified as ecologically sound and sold at a premium in specialty markets.



## WATER CREDITS

Careful management of water and wetlands is economically valuable for many reasons. Urban water authorities purchase water filtration credits to protect the quality of their watersheds; wetland owners can also receive compensation from government agencies for flood-control services, from conservation organizations for the preservation of migratory waterfowl breeding areas, and from agricultural cooperatives for the prevention of soil salinity increases caused by overdrawn groundwater aquifers.



COMMODITY	PERCENT OF FARM'S INCOME	CUSTOMER
Biodiversity credits	5	Conservation t
CO <sub>2</sub> offset credits	10	Steelmaker
Renewable electricity	15	Power market
Certified sustainable timber	20	Specialty mark
Water credits	20	Urban water ma
Wheat	15	World market
Wool	15	World market

past Director-General of UNESCO, Ms. Irina Bokova:  
“While **World Heritage** helps to **preserve values**,  
**Biosphere Reserves** are helping to **create them.**” \*



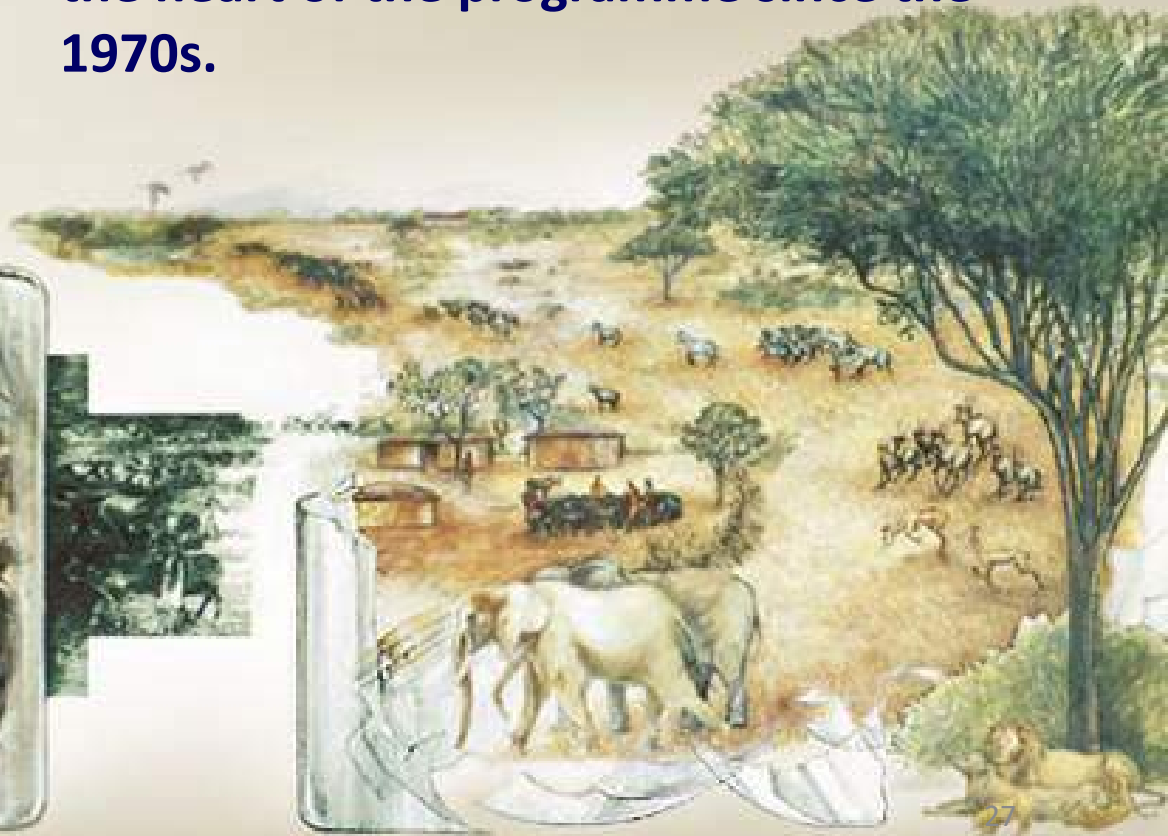
- Address by Irina Bokova, Director-General of UNESCO on the occasion of the International Conference "For life, for the future. Biosphere reserves and climate change" 40th anniversary of MAB Dresden, Germany, 27 June 2011
- 世界遺産は、価値を保存するための制度、生物圏保存地域は、価値を創造するための制度（前ユネスコ事務局長イリナ・ボコヴァ）

\* <https://unesdoc.unesco.org/ark:/48223/pf0000193127> p.5  
See also Tanaka & Wakamatsu (2018) Env. Manag. 61:155-170



# UNESCO's Man and the Biosphere (MAB) Programme

Biodiversity conservation, sustainable and equitable use for human well being are at the heart of the programme since the 1970s.



BIODIVERSITÉ

CONSERVATION

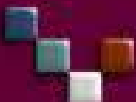
RECHERCHE

SURVEILLANCE  
CONTINUE

ÉDUCATION

FORMATION

DÉVELOPPEMENT  
DURABLE



# Dasgupta Report (2021)

“Correct economic reasoning is entangled with our values. Biodiversity does not only have instrumental value, it also has intrinsic worth – perhaps even moral worth. Each of these senses is enriched when we recognise that we are embedded in Nature. To detach Nature from economic reasoning is to imply that we consider ourselves to be external to Nature. The fault is not in economics; it lies in the way we have chosen to practise it.” (P. Dasgupta, 2021)



= Living in harmony with nature  
= MAB programm





[www.unenvironment.org](http://www.unenvironment.org)

# A new deal for Nature (21 May 2019)



In 2020, world leaders will meet in China to agree on a new set of commitments to conserve nature. They will also review progress towards targets set in 2010; but the news is not all good. Only a quarter of land on Earth is substantively free of the impacts of human activities. This is projected to decline to just one-tenth by 2050. The implications of such drastic changes in nature for human health, well-being, security and economic development are staggering.

Because our current pathway is unsustainable, **humans and nature alike need a new deal - a new way to coexist and thrive.**

Transformed political approaches, bold visions and effective leadership are essential to address our complex

## Five transformations.

1. Account for the True Value of Nature
2. Change the Way We Produce and Consume Food
3. Conserve Wildlife and Wild Spaces
  - Enhanced investment in robust biodiversity-based economies that increase benefit flows to the people living with and bearing the costs of wildlife.
4. Restore the Degraded Planet
5. Promote a Better Built Environment

Ideas of people who do not live with wildlife.



# Today topics

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the Biosphere  
programme



Sustainable  
Development  
Goals



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Chair *Logo-use request in progress*

# Protection, Conservation, Restoration : From wilderness to ecosystem services



Aldo Leopold  
(1887-1948)

Rachel Carson  
(1907-1964)



Nature's contributions to people



1980~

Sustainable Development

1992~

Biodiversity

2005~

Ecosystem services

Edward O. Wilson  
(1929-)



19c ~

Protection of wilderness



Protection

Conservation

Restoration

WNH

BR, Ramsar

# SDGs and UNESCO's Man and the Biosphere Program

- Sustainable development = defined as development that meets the needs of the present generation without compromising the ability of future generations to meet their needs [World Commission on Environment and Development (**Brundtland Commission** 1987)].
- To achieve sustainable development, it is essential to harmonise the three main elements of economic growth, social inclusion and environmental protection.





# ( 1 ) SDGs (Sustainable Development Goals)

- Adopted at the UN Summit in September 2015  
(predecessor of the Millennium Development Goals (MDGs)).
- The SDGs are 17 international goals (169 targets and 232 indicators are defined under the goals) for the realization of a sustainable, diverse, and inclusive society that "leaves no one behind" by the year 2030.



No population control

No major goal against  
Infectious diseases

- SDGs are more integrated than MDGs (I support!)
- I say, SDGs are a bit over-ambitious.
- I recommend more realistic goals for post SDGs



(Poverty) End poverty in all its forms everywhere.



(Hunger) End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.



(Ensure healthy lives and promote the well-being of all people of all ages.



(Ensure inclusive and equitable quality education for all and promote lifelong learning opportunities.



(Achieve gender equality and empower all women and girls.



(Ensure availability and sustainable management of water and sanitation for all.



(Ensure access to affordable, reliable, sustainable and modern energy for all.



(Economic growth and employment) Promote inclusive and sustainable economic growth and full and productive employment and decent work for all.



(Infrastructure, industrialisation, innovation) Build resilient infrastructure, promote inclusive and sustainable industrialisation and innovation.



(Inequality) Reduce inequalities within and between countries.



(sustainable cities) Realize inclusive, safe, resilient cities and human settlements.



Ensure sustainable production and consumption patterns.



(Climate change) Take urgent measures to mitigate climate change and its effects.



(Marine resources) Conserve and sustainably use marine and offshore resources for sustainable development.



(Terrestrial resources) Protect, restore and promote sustainable use of terrestrial ecosystems, manage forests sustainably, combat desertification, and halt or restore land degradation and prevent loss of biodiversity.



(Peace) Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.



(Means of implementation) Strengthen the means of implementation for sustainable development and revitalise the global partnership.

- People - ensure that the human rights of all are respected, dignified, equal and able to fulfil their potential. End poverty and hunger, achieve gender equality and ensure education, water, sanitation and healthy living for all.
- Planet - protect the planet from destruction through responsible consumption and production, sustainable management of natural resources and urgent response to climate change
- prosperity - Ensuring that all people lead prosperous and fulfilling lives and ensuring economic, social and technological progress in harmony with nature.
- peace - for a peaceful, just, inclusive world, free from fear and violence.
- partnership - achieved through global partnerships involving a diverse range of actors, including governments, the private sector, civil society and UN agencies.

## 5 P's



出典：国際連合広報局

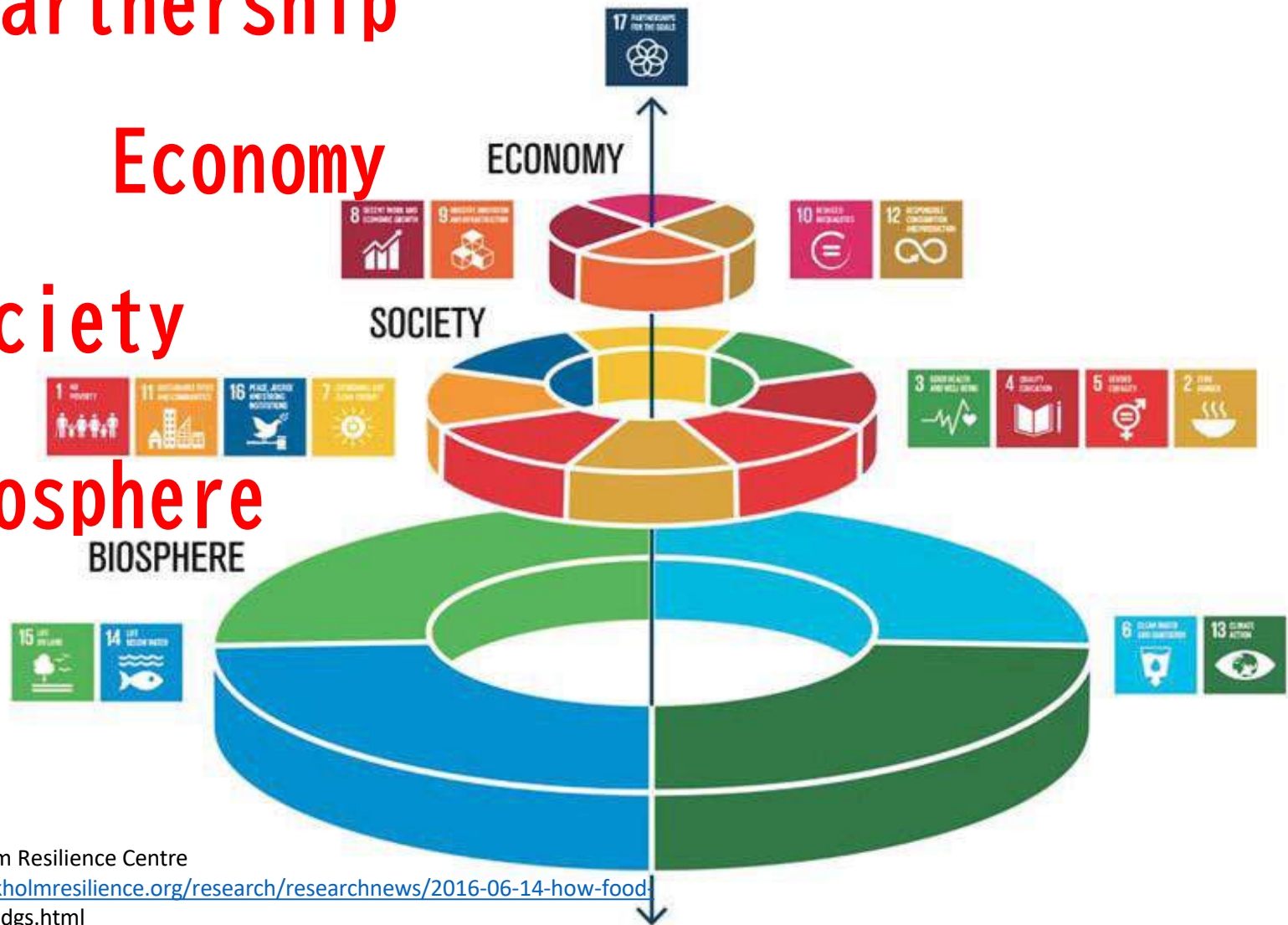
# Wedding cake of SDGs

Partnership

Economy

Society

Biosphere



出典：Stockholm Resilience Centre

<http://www.stockholmresilience.org/research/researchnews/2016-06-14-how-food-connects-all-the-sdgs.html>

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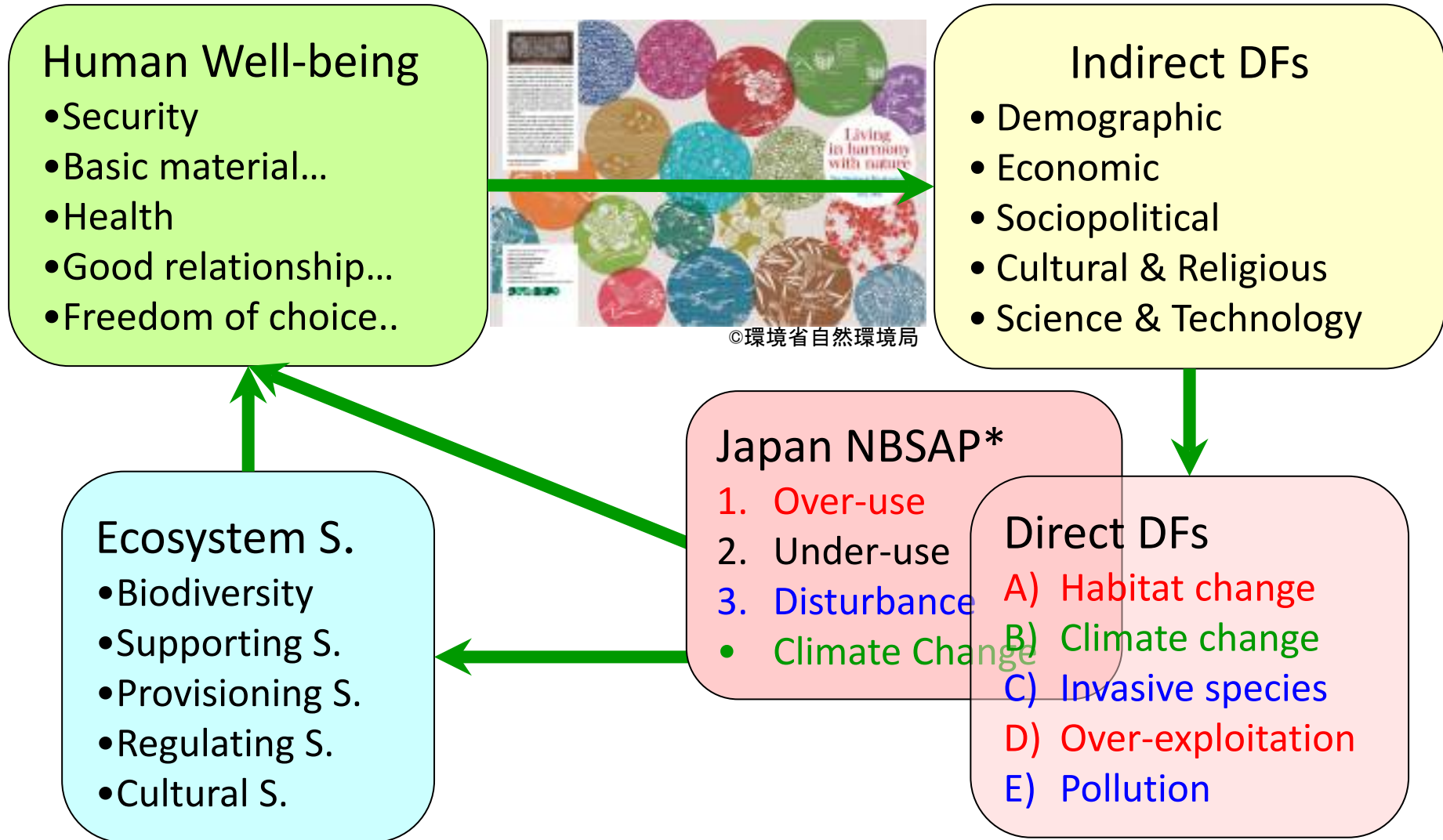


**unesco**

Chair *Logo-use request in progress*

# Millennium Ecosystem Assessment (MA) scheme

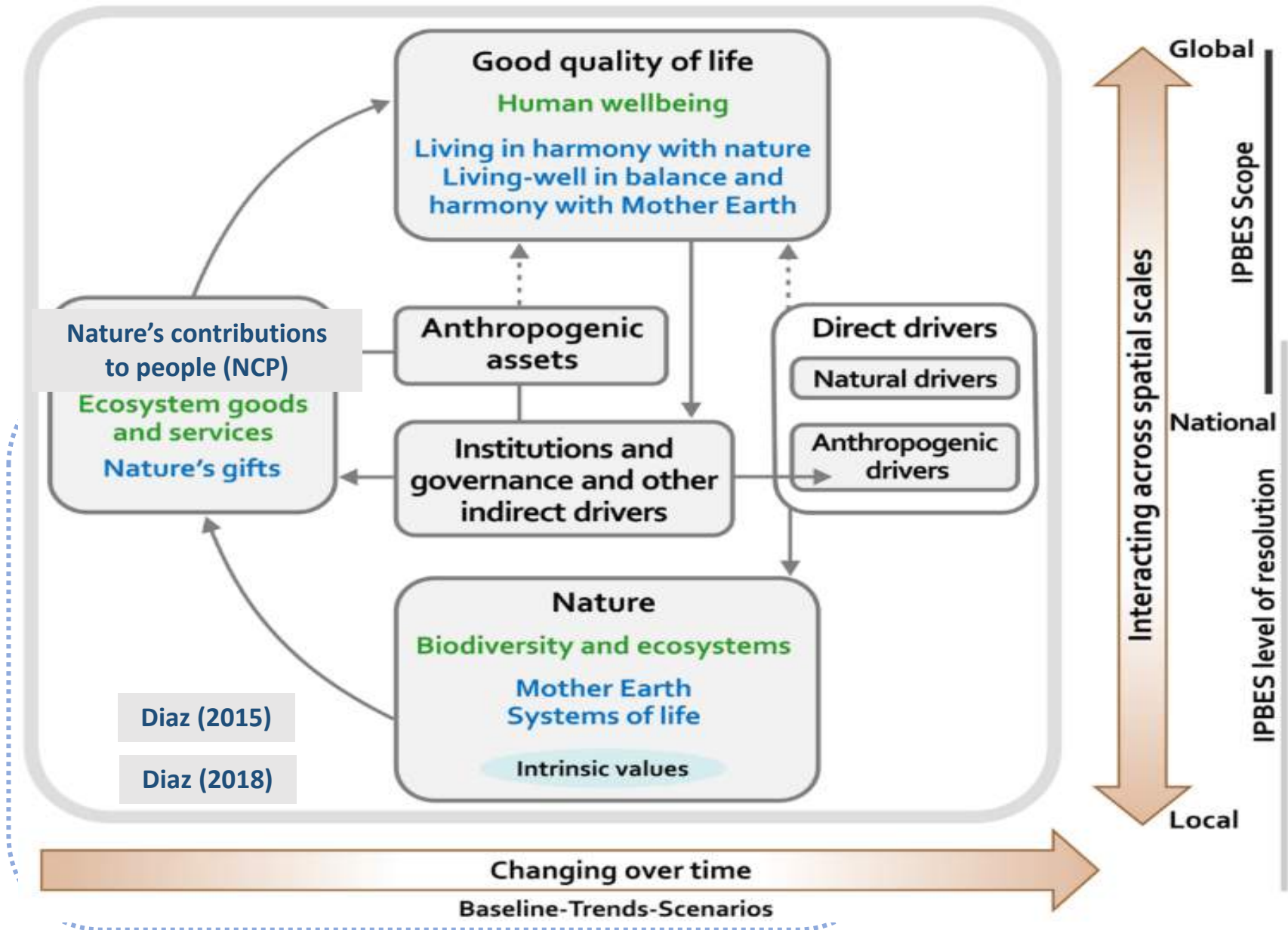
## National Biodiversity Strategy of Japan



\*NBSAP = National Biodiversity Strategy & Action Plan



# Why do we conserve nature?



# The end of the Oil Age

[www.economist.com](http://www.economist.com) Oct 23rd 2003



- “The Stone Age did not end for lack of stone, and the Oil Age will end **long before** the world runs out of oil.” the quotation is from Sheikh Zaki Yamani, a past oil minister of Saudi Arabia (in 1970’s).
- Because he believes that something fundamental has shifted since that first oil shock. Finally, advances in technology are beginning to offer a way for economies, especially those of the developed world, to diversify their supplies of energy and reduce their demand for petroleum, thus loosening the grip of oil and the countries that produce it.

# Why overfishing happens?

- Economic discount rate  $\delta$ 
  - It is more profitable to catch >40,000 minke whales at once and invest that can make a profit of 5% per year than to catch 2000 whales a year.
  - If  $r < 4\delta$ , overfishing is profitable: forests, whales
- The Tragedy of the Commons
  - If you avoid overfishing, but someone else is overfishing, they gain a short-term profit and you and they lose a future profit.

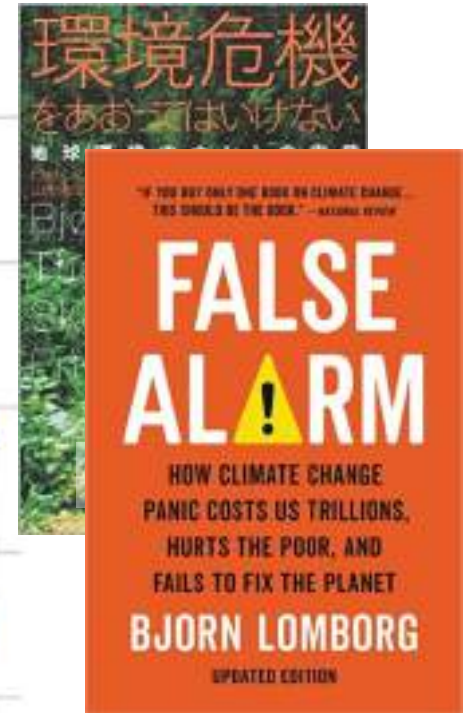
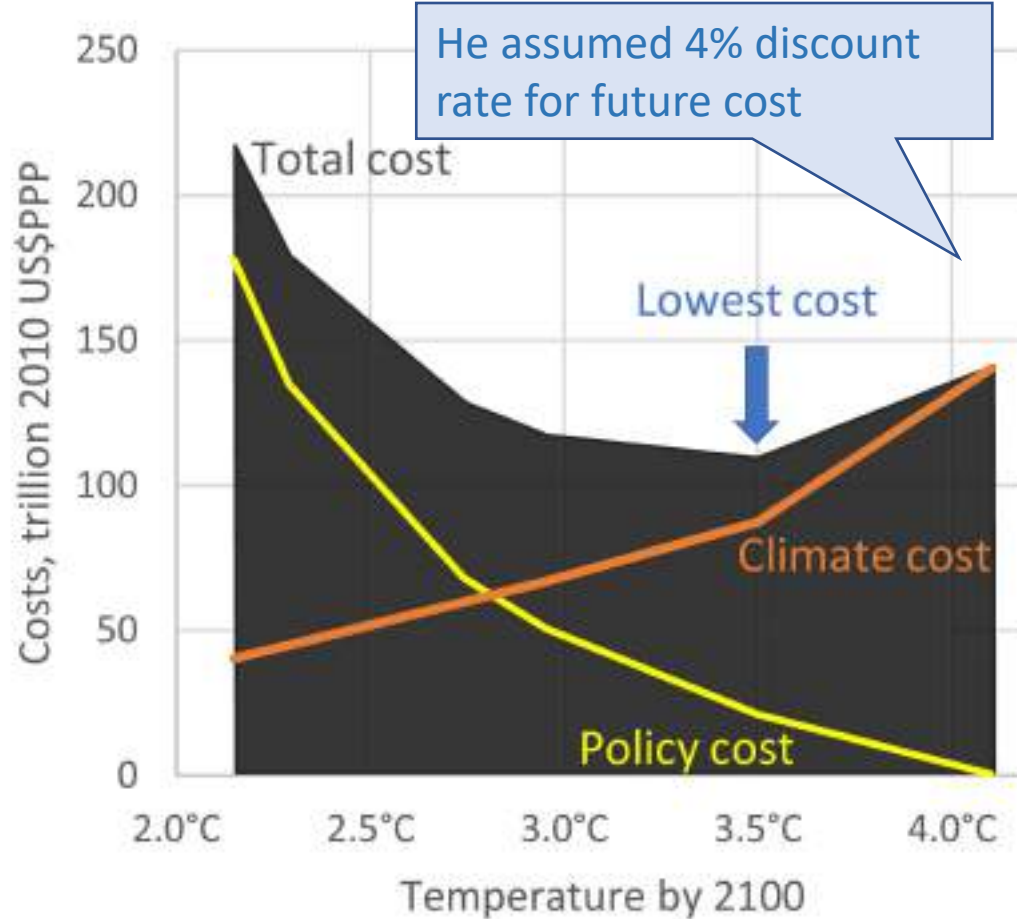


$$C_{MSY} = rK/4, \sum_t C_{MSY} (1-\delta)^t = rK/4\delta$$
$$C + C(1-\delta) + C(1-\delta)^2 + \dots = C/\delta$$



# Do the cost of mitigation measures outweigh benefits?

(Bjørn Lomborg  
2020 Technol.  
Forecast. Soc.  
Change.)



PPP = Purchasing  
Price Parity

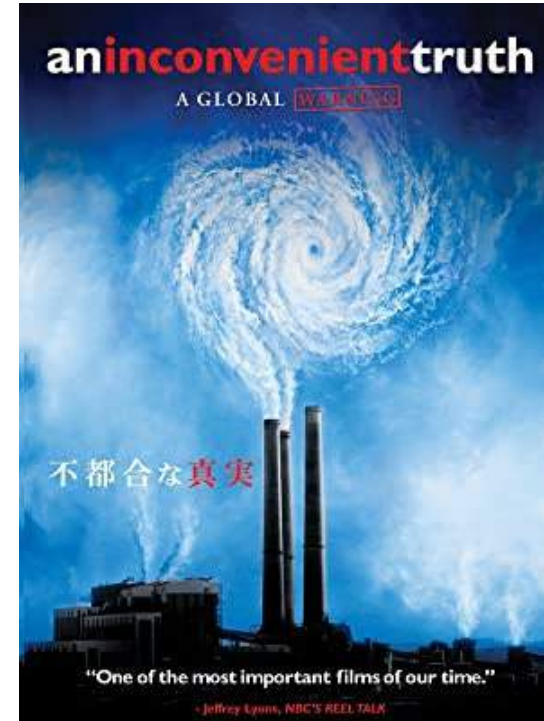
- Fig. 24. Total, discounted climate costs and policy costs for different temperature outcomes by 2100, along with the total cost (the sum of climate and policy cost). All use base (4.1 °C) discount rates for comparability. DICE-2016R2 from 2017 ([Nordhaus 2018a](#)) run on GAMS,. The results for 4.1 °C, 3.5°C and 2.3°C are near-identical to the runs in ([Nordhaus 2018b](#)).

# Gore “An Inconvenient Truth”

- This is Patagonia 75 years ago and the same glacier today. This is Mt. Kilimanjaro, 30 years ago and last year. Within the decade, there will be no more snows of Kilimanjaro.

**This is really not a political issue so much as a moral issue.**

Temperature increases are taking place all over the world. And that's causing stronger storms



『お金で買えない価値がある  
買えるものはマスターカードで』



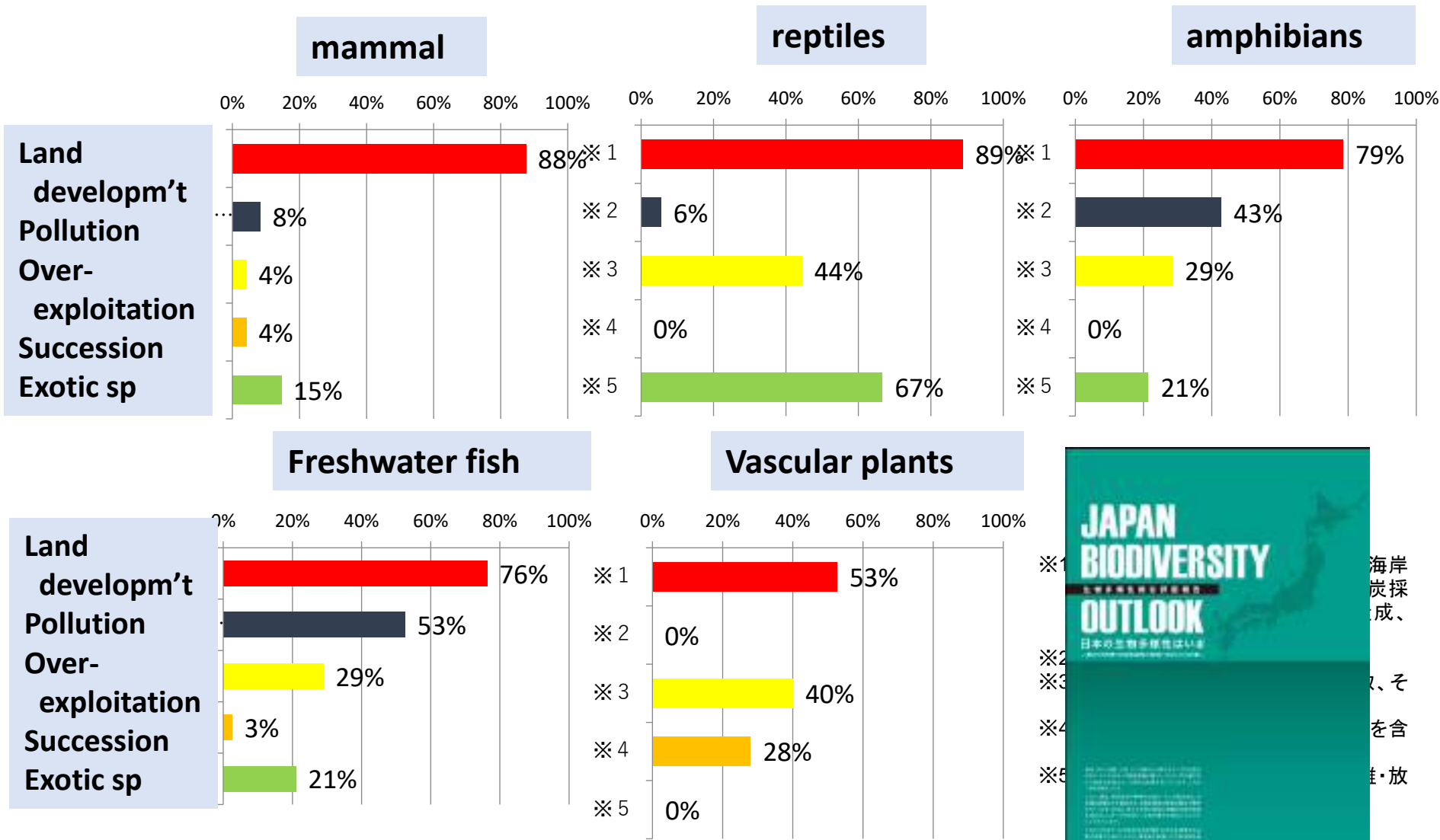
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- Mastercard's 1997 "There are some things money can't buy. For everything else, there's Mastercard."

# Divers of loss in biodiversity



海岸炭採成、  
、そ  
を含  
・放

出典：環境省，改訂・日本の絶滅のおそれのある野生生物

哺乳類（2002）、爬虫類（2000）、両生類（2000）、汽水・淡水魚類（2002）、植物（維管束植物）（2000）

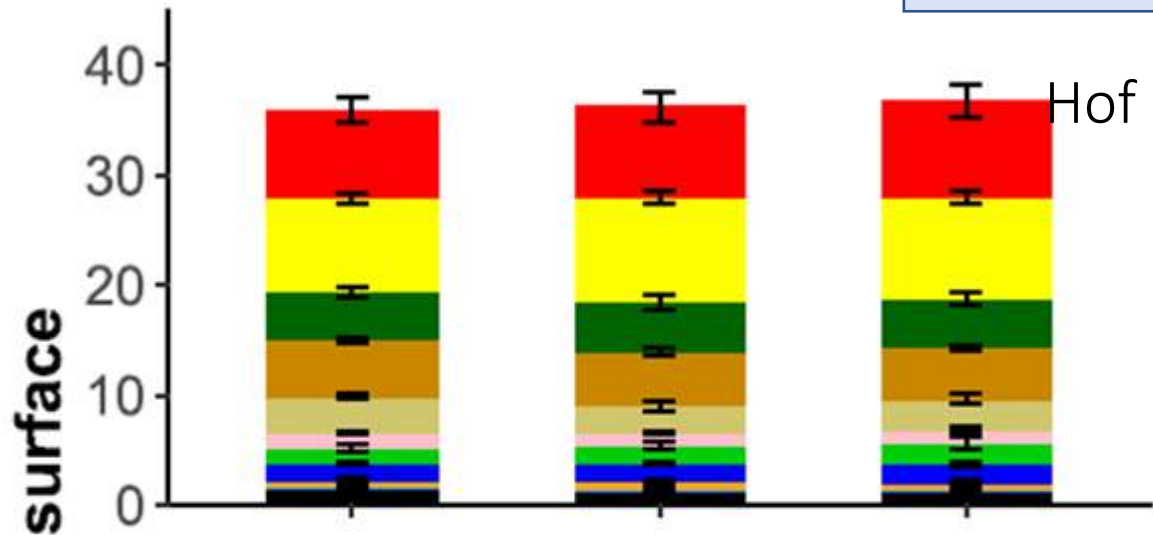
注：本資料は、議論のたたき台とするため、現時点の作業結果をもとに内容や表現の妥当性にこだわらず作成したもので、今後の検討により大幅な変更がありうる。



RCP2.6

2°C Scenario

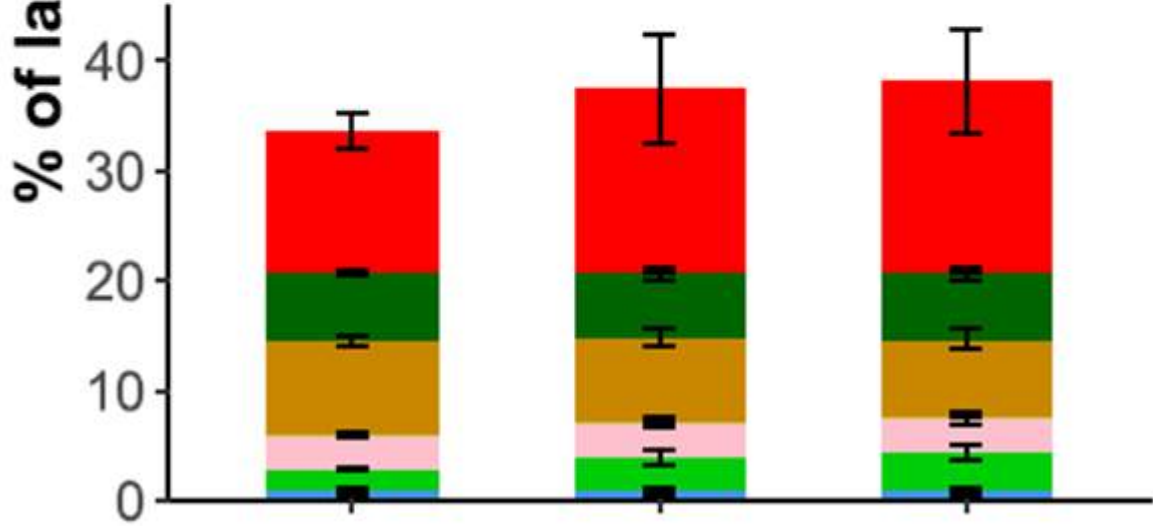
Hof et al. (2018 : PNAS 115)



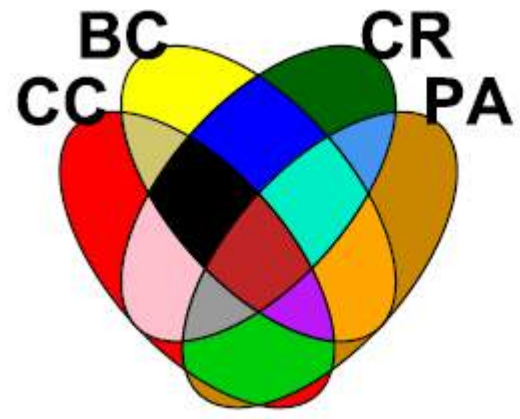
- Biofuel crops for mitigation has a significant negative impact on biodiversity.

RCP6.0

3.5°C Scenario



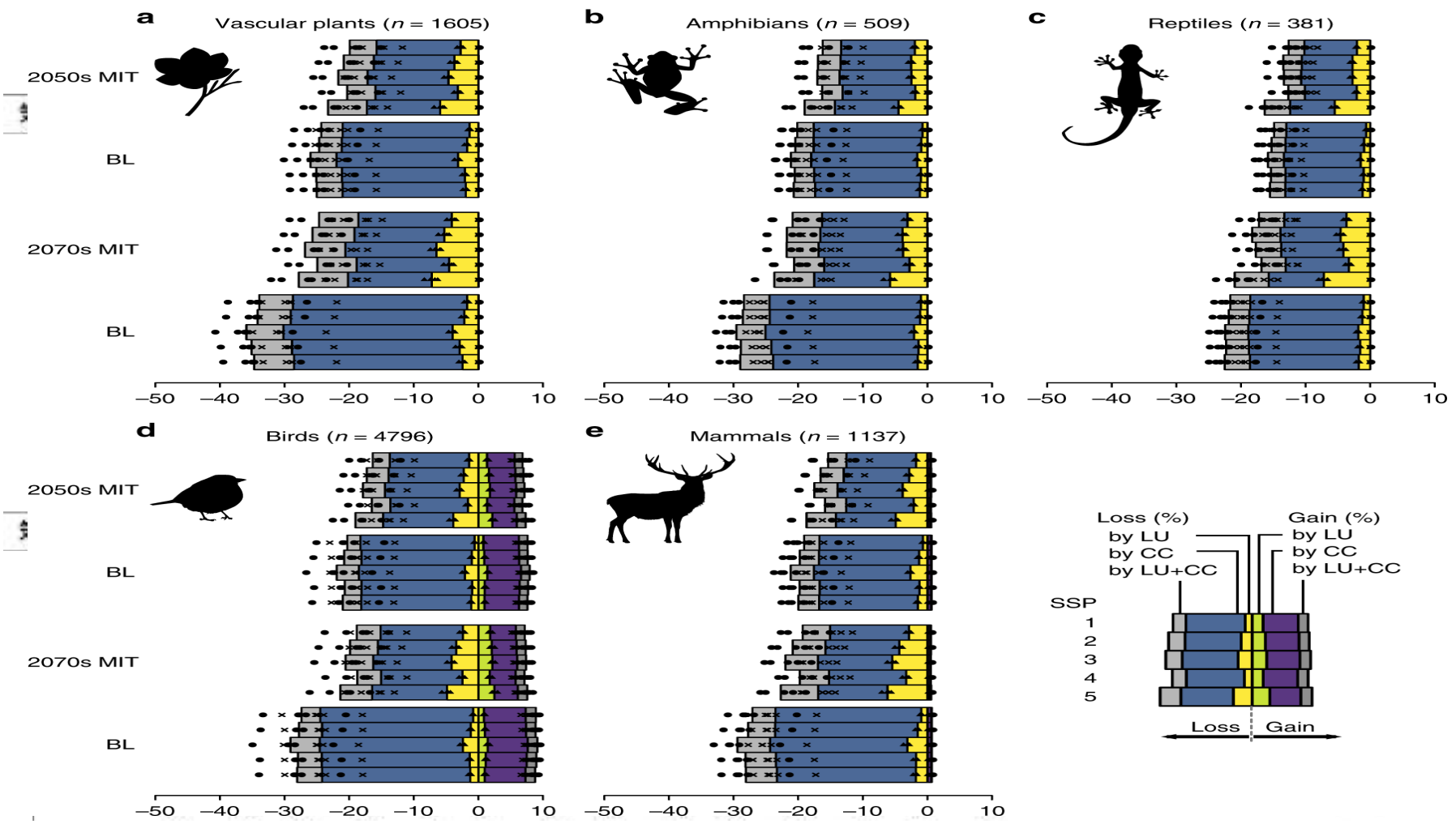
BC, Biofuel crops  
 CC, Climate Change  
 CR, non-biofuel crops  
 PA, pastures







# Biodiversity loss can be halted through climate mitigation efforts

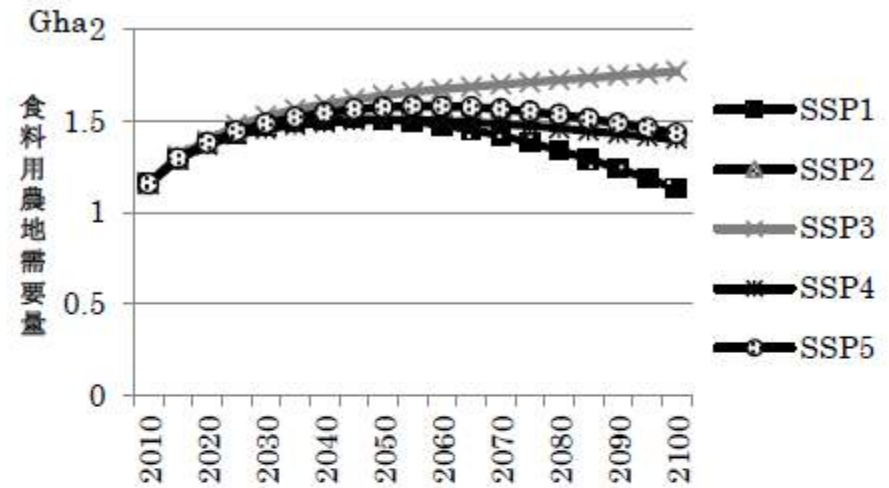


(modified from Ohashi *et al.* 2019 *Nature Communications*)

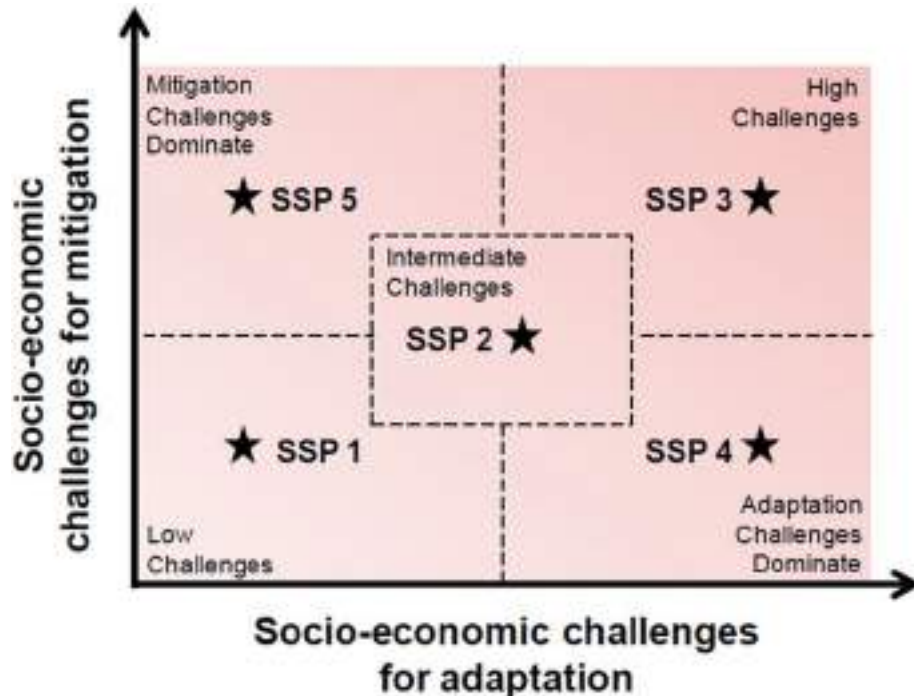
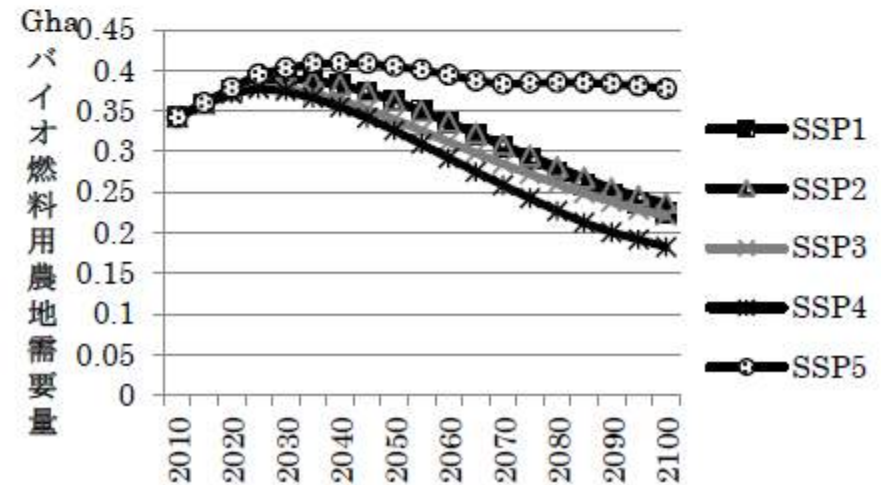
# About 20% of the world's farmland is for biofuel



Sugarcane fields for biofuel in Brazil (source; Mitsui Bussan)

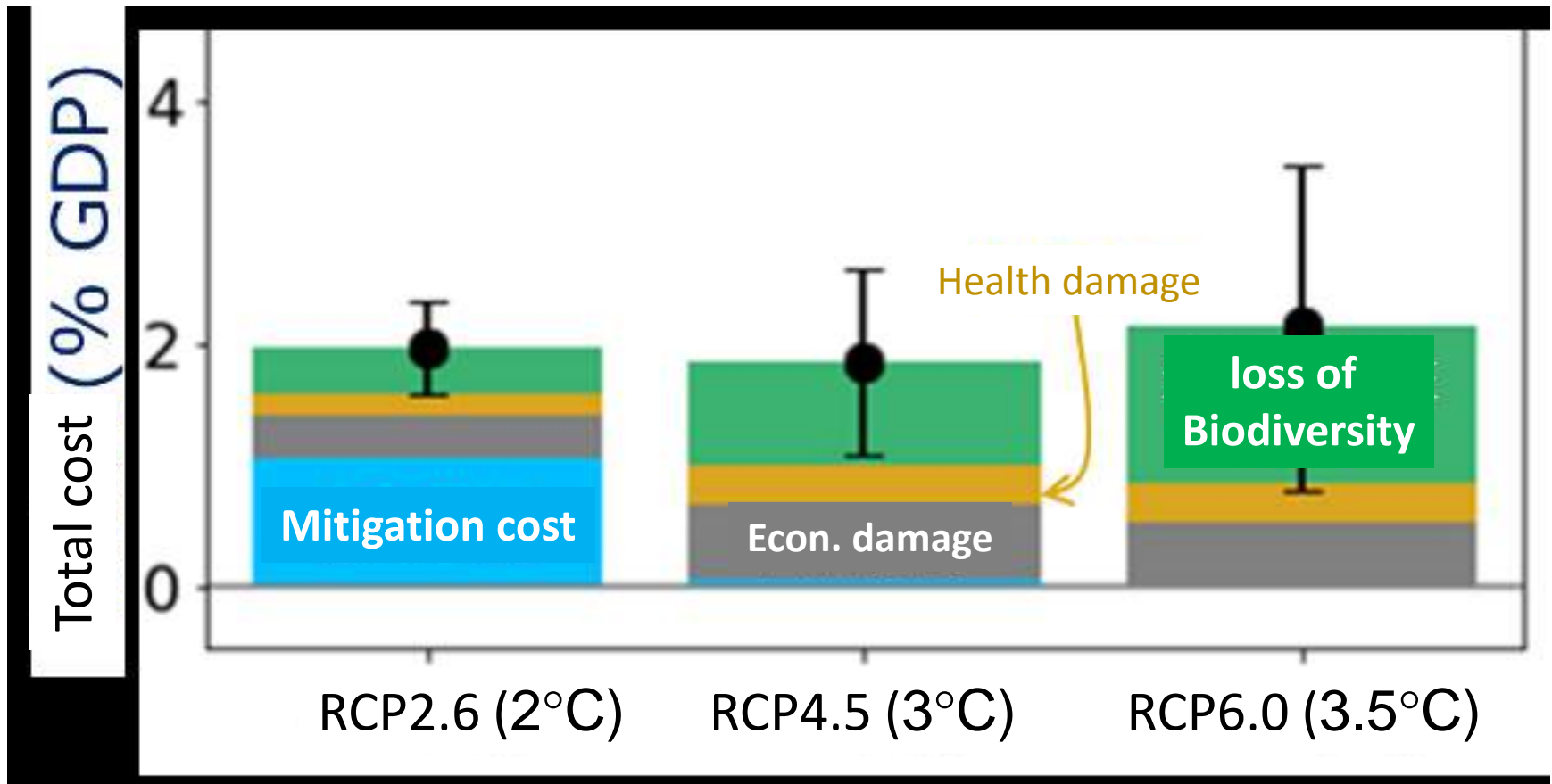


b.



田村 賢人ら(2014土木学会環境システム研究論文発表会講演集)

# Total cost of climate change—Non-market values (biodiversity and human health and the 2°C target (Oda et al. 2024 *Environ. Res. Lett.* **18** 084026)



Note: **We used 0.1% discount rate** for non-market values.

# Today topics

- World Heritage and Biosphere Reserves
- SDGs (Sustainable Development Goals)
- Ecosystem Services, Nature's Contributions to People
- 30by30 and OECM (Other Effective area-based Conservation Measures)
- Reaction to Pre-lecture exercise and further exercise



UNESCO Chair on Education  
in Biosphere Reserves for  
Sustainable Societies

Yokohama National University



United Nations  
Educational, Scientific and  
Cultural Organization



Man and  
the Biosphere  
programme



Sustainable  
Development  
Goals



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Chair *Logo-use request in progress*

# Kunming-Montreal Global Biodiversity Framework” (GBF), 23 targets for achievement by 2030 (part 2)

1. Loss of high biodiversity important areas are close to zero
2. >30% degraded ecosystems are under effective restoration,
3. **>30% of land areas and of sea areas** are effectively conserved and managed by protected areas and other effective area-based conservation measures (OECMs)
4. To halt human induced extinction, to maintain the genetic diversity, and to minimize human-wildlife conflict.
5. Ensure that the use, harvesting and trade of wild species is sustainable, safe and legal, preventing overexploitation.
6. To reduce by >50% the impacts of invasive alien species.
7. Halve nutrient run-off into the environment, pesticide risks and reduce plastic pollution
8. Contribute to climate change mitigation and adaptation with nature-based solutions
9. Sustainable management and use of species ensures social and environmental benefits for vulnerable populations
10. Sustainable management of agriculture, aquaculture, fisheries and forestry
11. Maintain the nature’s contributions to people, including regulation of air, water, climate, soil, pollination and disease
12. **Increase in access and benefits of green and blue spaces**
13. Implement measures to promote access to genetic resources and fair and equitable sharing of benefits
14. Integrate biodiversity values into policy, regulation, accounting, development
15. Require companies and financial institutions to assess and gut their risks, dependencies and impacts on biodiversity
16. Halve food waste, reduce over-consumption and enable citizens to make informed and responsible choices
17. Enhance capacities to deal with negative effects of biotechnology
18. Eliminate incentives and subsidies harmful for biodiversity, in a fair, effective and equitable way
19. Increase financial mobilisation to \$200 billion per year and funds for developing countries to \$30 billion per year
20. Strengthen scientific research for the conservation and sustainable use of biodiversity
21. Make data, information and knowledge for effective management
22. Equitable participation of indigenous peoples, women and youth in decision-making and respect for their rights
23. Ensure gender equality in the implementation of the framework

## Target 3 (30 by 30)

- The framework has 23 action-oriented global targets for urgent action over the decade to 2030.
- Target 3. Ensure and enable that **by 2030 at least 30 per cent** of terrestrial, inland water, and of coastal and marine areas, especially areas of particular importance **for biodiversity and ecosystem functions and services**, are effectively conserved and managed through ecologically representative, well-connected and equitably governed systems of **protected areas and other effective area-based conservation measures [OECM]**, recognizing indigenous and traditional territories, where applicable, and integrated into wider landscapes, seascapes and the ocean, while ensuring that any sustainable use, where appropriate in such areas, is fully consistent with conservation outcomes, recognizing and respecting the rights of indigenous peoples and local communities, including over their traditional territories.

# Aichi Biodiversity Targets 2010-20

- Target 11: By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of **particular importance for biodiversity and ecosystem services**, are conserved through effectively and equitably managed, ecologically representative and well connected systems of **protected areas and other effective area-based conservation measures**, and integrated into the wider landscapes and seascapes.
- 目標11: **2020年**までに、少なくとも陸域及び内陸水域の17%、また沿岸域及び海域の10%、特に、**生物多様性と生態系サービス**に特別に重要な地域が、効果的、衡平に管理され、かつ生態学的に代表的な良く連結された**保護地域システム**や**その他の効果的な地域をベースとする手段**を通じて保全され、また、より広域の陸上景観や海洋景観に統合される。

# IUCN Categories of Protected areas (N.Dudley 2008)

保護地域Category of protected areas	主な管理目的Areas managed mainly for
Ia 厳正自然保護地域 Strict nature reserve	厳格な保護／主に科学的研究 Strict protection
Ib 原生自然保護地域 Wilderness area	厳格な保護／主に原生自然の保護 Strict protection
II 国立公園 National park	主に生態系の保全と保護 Ecosystem conservation and protection
III 天然記念物 Natural monument or feature	主に特定の自然の特徴を保全 Conservation of natural features
IV 生息地/種の管理区域 Habitat / species management area	主に人間の管理介入を通じた保全 Conservation through active management
V 陸上/海洋景観保護地域 Protected landscape / seascape	主に陸上・海洋景観の保全及びレクリエーション Landscape / seascape conservation and recreation
VI 持続的資源利用保護地域 Protected Area with sustainable use of natural resources	主に資源の持続可能な利用 Sustainable use of natural resources

Protection only

Sustainable use



## “Other Effective area-based Conservation Measure” (OECM) means

- “a geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long-term outcomes for the *in situ* conservation of biodiversity, with associated ecosystem functions and services and, where applicable, cultural, spiritual, socioeconomic, and other locally relevant values”;
- 2018年7月の生物多様性条約の会合（SBSTTA22）でOECMとは「生物多様性、およびこれに関連した生態系の機能とサービス、ならびに適当な場合には文化的、精神的、社会経済的およびその他の地域関連の価値の域内保全に対し、**継続的に正の成果をもたらす**ような方法で運営・管理される、**保護地域以外の**地理的に画定された地域」と定義された。

[CBD/SBSTTA/22/L.2 6 July 2018](https://www.cbd.int/doc/2018/07/2018-07-06-sbstta-22-l2-06-en.pdf)

<https://www.env.go.jp/press/105646.html>

If the PA definition is unclear,  
the OECM definition will be either.

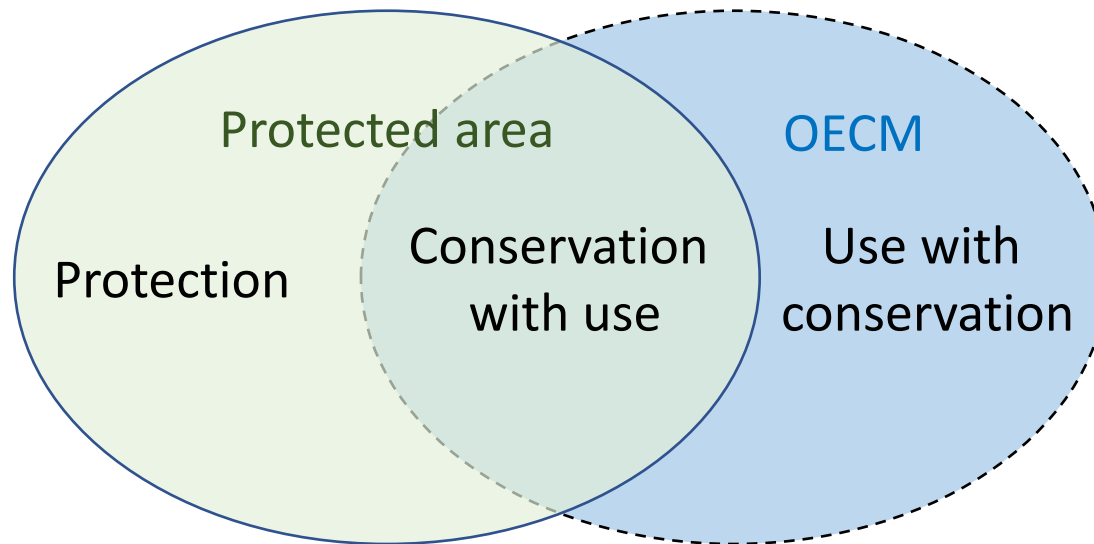


# Harry Jonas & Nigel Dudley

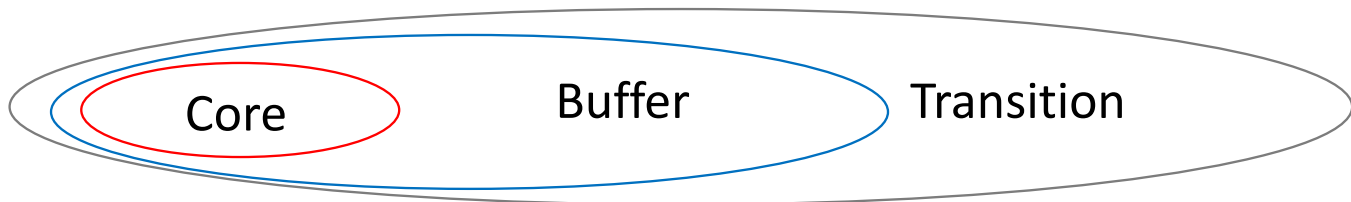
A brief introduction to 'Other Effective Area-based Conservation Measures'

- Specifically, while **protected areas should have a primary conservation objective** (i.e. aim to promote the *in-situ* conservation of biodiversity), the defining criterion of an OECM is that it should deliver the effective and enduring *in-situ* conservation of biodiversity, regardless of its primary management objectives.
- 具体的には、**保護地域は生物多様性の保全が第一義**的な目的であるべきだが、OECMは第一義の管理目的にかかわらず、効果的かつ持続的な生物多様性の保全を実現することが定義基準である。

# Idea on the relationship between protected area and OECM



Zoning of biosphere reserve



LiHwN = OECM sites on private land in Japan



# 3 types of OECMs

- 1. Ancillary conservation:** areas delivering *in-situ* conservation as a by-product of management, i.e. where biodiversity conservation is not an objective (e.g. some military training grounds).
- 2. Secondary conservation:** active conservation of an area where biodiversity outcomes are a secondary management objective (e.g. some watershed management areas);
- 3. Primary conservation:** areas meeting the IUCN definition of a protected area, but where **the governance authority does not wish the area to be reported as a protected area**. This is likely to be a relatively rare category of OECM, and would be used to avoid unintended consequences, such as in countries where government regulations forbid human occupation in a protected area [religious sanctuary]

# Deer “eats” BRs and WHs

Photos, Masaki pass, Odaigahara  
BR : Deer management based  
on the nature restoration project



平成16年（2004年）の正木峠



1963年



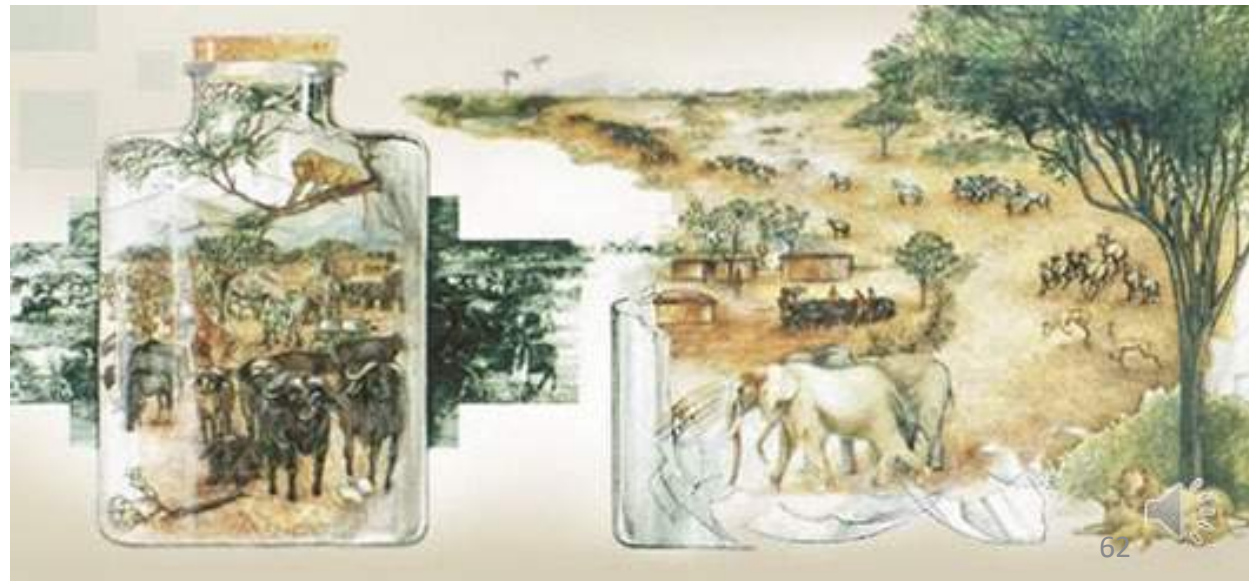
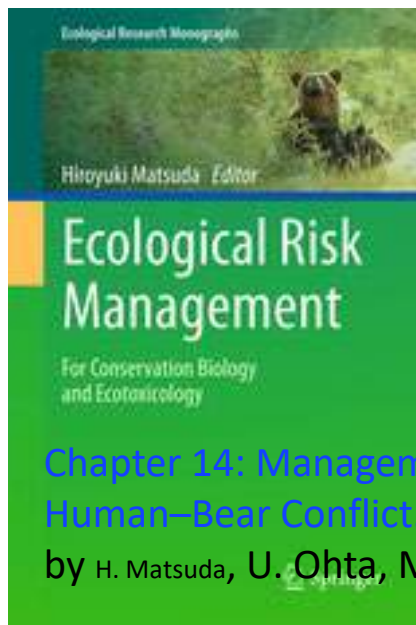
1996年

撮影：奈良女子大学名誉教授  
菅沼 孝之氏

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# Biosphere consists of nature and people.

- “If farming is to coexist with wild birds and beasts, ... the human–wildlife conflict is inevitable in agriculture, forestry and fisheries.”
- People are inseparable from the biosphere, and thus not only use wildlife but are **sometimes being used by wildlife too.**



# “Cat wars” controversy

- [Europe and USA] There is a **serious conflict between bird-watchers and cat-lovers** because wild and free-ranging (pet) cat prey on wild birds.
- The domestic cat is an alien predator in the “World’s 100 Worst **Invasive Alien Species**”. Predation of cats has become a major cause or cause of the extinction of 33 of the 238 extinct reptiles, birds and mammals in the world. *Toxoplasma*, a zoonotic disease transmitted by cats, poses a significant risk to the fetus if a woman is first infected during pregnancy. Prevalence of women of childbearing age = **63% in Germany and 4% in South Korea**.

Among of 87 women of age 15-45, 25% were seropositive for *T. gondii* IgG and IgM antibodies in Mymensingh and Rangpur, Bangladesh (Margia et al. 2017)

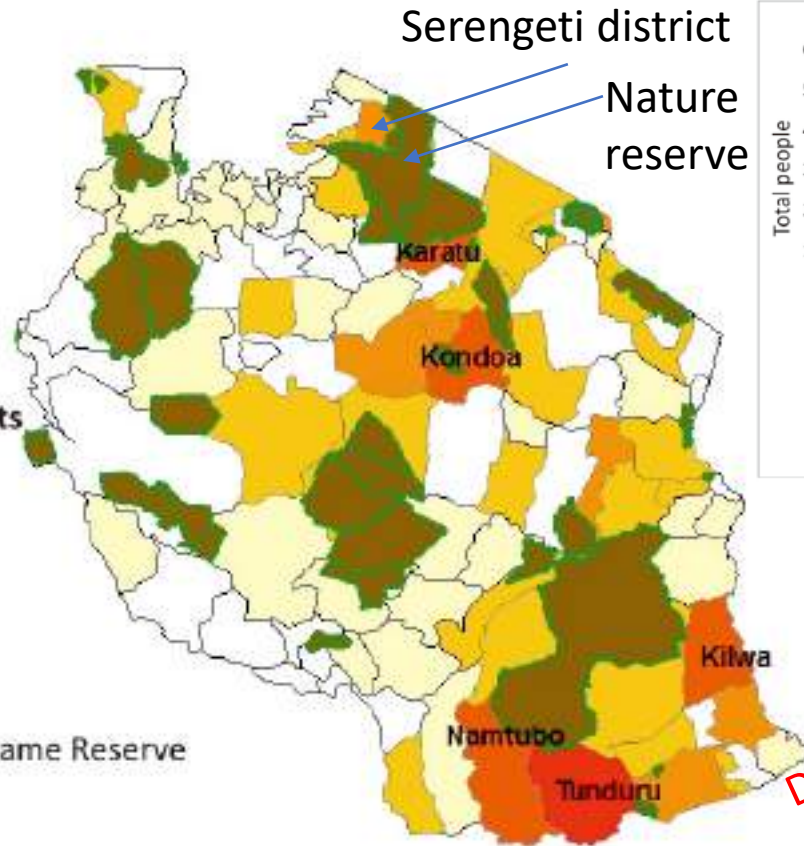
- Nature protection differs from animal welfare. The lack of agreement on how to treat free-ranging cats is a big problem. [**The theory of nature conservation has changed, and will change.**].



(Marra & Santella 2019)

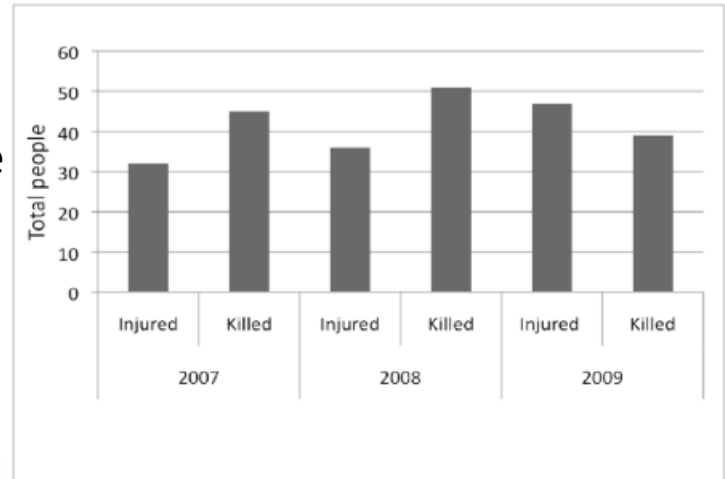
Dozens of people per year have been killed by elephants throughout Tanzania for about 10 years.

HEC = Human Elephant Conflict



Total number incidents

- 28
- 11-20
- 6-10
- 1-5
- No incidents
- No data
- National Park or Game Reserve

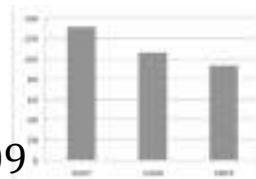


**Figure 14.** Reported human mortality and injuries caused by elephants, 2007-2009.

*Do not use elsewhere*

**Figure 15.** Human mortality and injuries caused by elephants, by district 2007-2009

Fig.16. Reported problem elephants shot, by year, 2007-2009



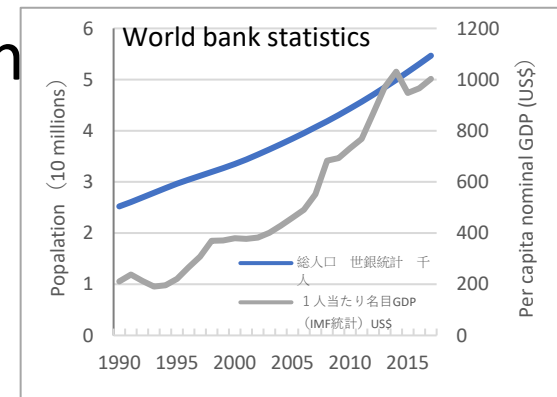
Tanzania Elephant Management Plan 2010



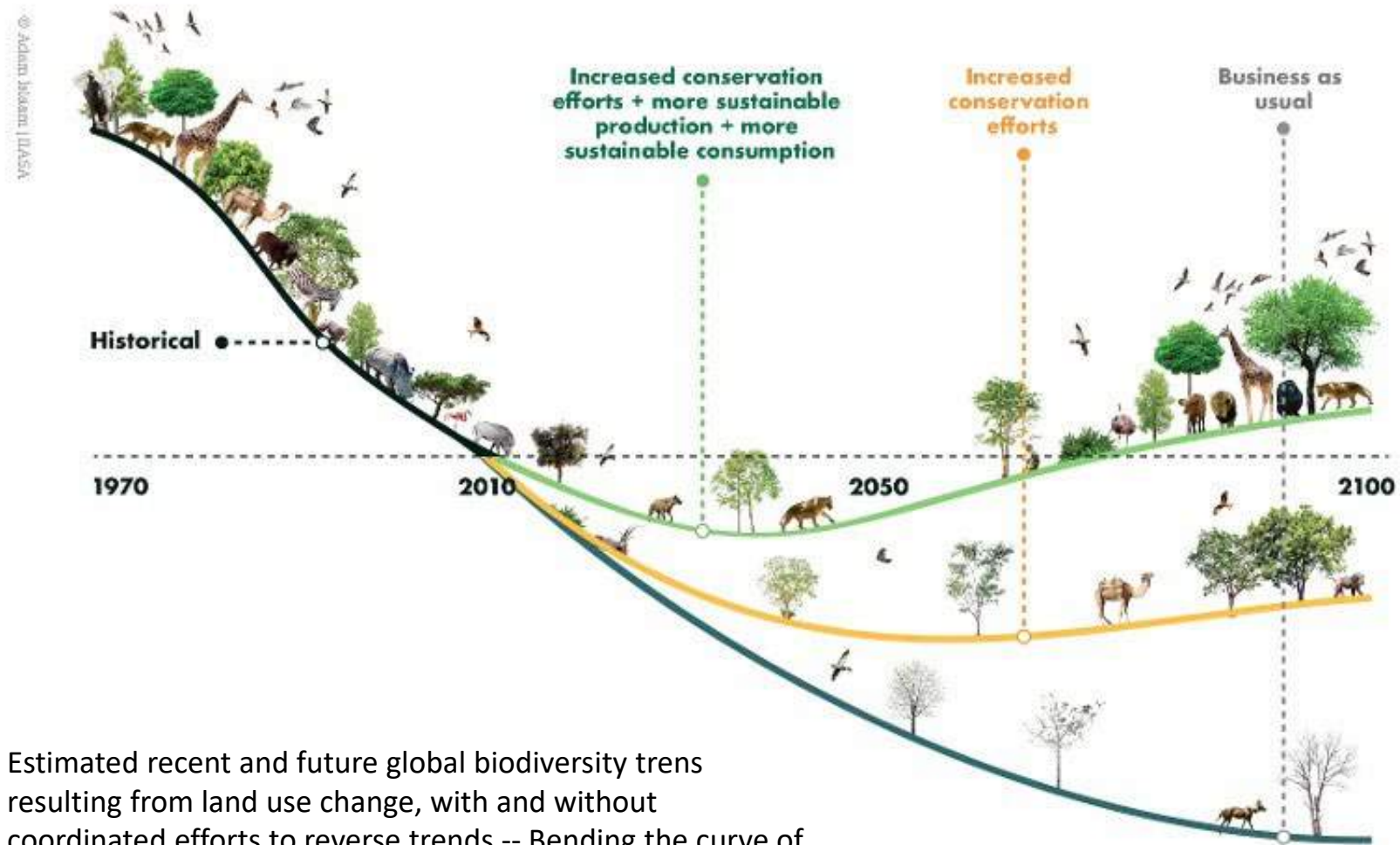
## Q2 What is the reason for the decrease in areas where African elephants are decreasing?

- “poaching for ivory and meat has traditionally been said to be the main cause of African elephant decline, and illegal hunting remains a significant factor in some regions, especially in Central Africa.
- A bigger factor is the loss and fragmentation of the habitats due to rapid land development associated with population growth. Specific signs of this trend are reported to be an increase in human-elephant conflicts, which exacerbates the threat to elephant populations. \*”

<https://www.globalnote.jp/post-2805.html>



# Pathway to “nature positive”



Estimated recent and future global biodiversity trends resulting from land use change, with and without coordinated efforts to reverse trends -- Bending the curve of terrestrial biodiversity needs an integrated strategy.

Leclère et al. 2020 *Nature* **585**: 551

# NY State kills deer

- Culling—In many urban and suburban situations, hunting may not be able to lower deer populations enough to bring impacts down to a sustainable level (Williams et al., 2013). In these cases, the best option may be culling, which is the term for killing deer outside of a hunting framework. In New York, a DEC-issued DDP is necessary for a culling program to occur, and such permits typically allow the use of methods that are not available to hunters, which is why culling is usually more effective for rapid population reduction than hunting.

People kill deer and eat deer meat while NY mayor (≠ not state) says not to use ivory taken from elephants that kill people in Africa.

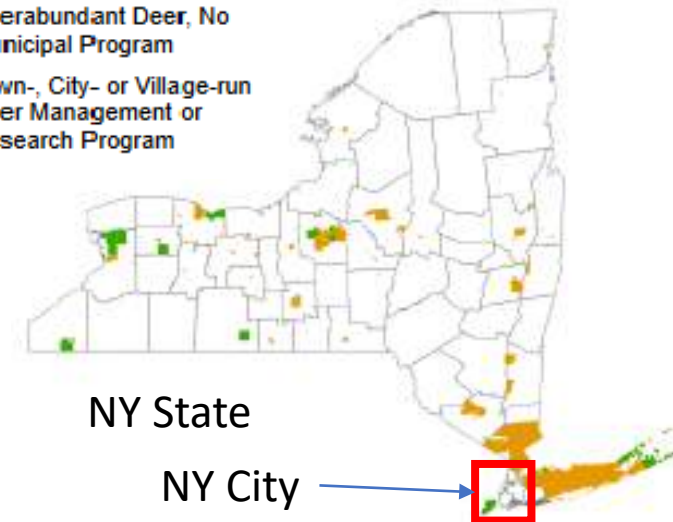
## DEER MANAGEMENT IN URBAN AND SUBURBAN NEW YORK

A Report to the New York State Senate and Assembly

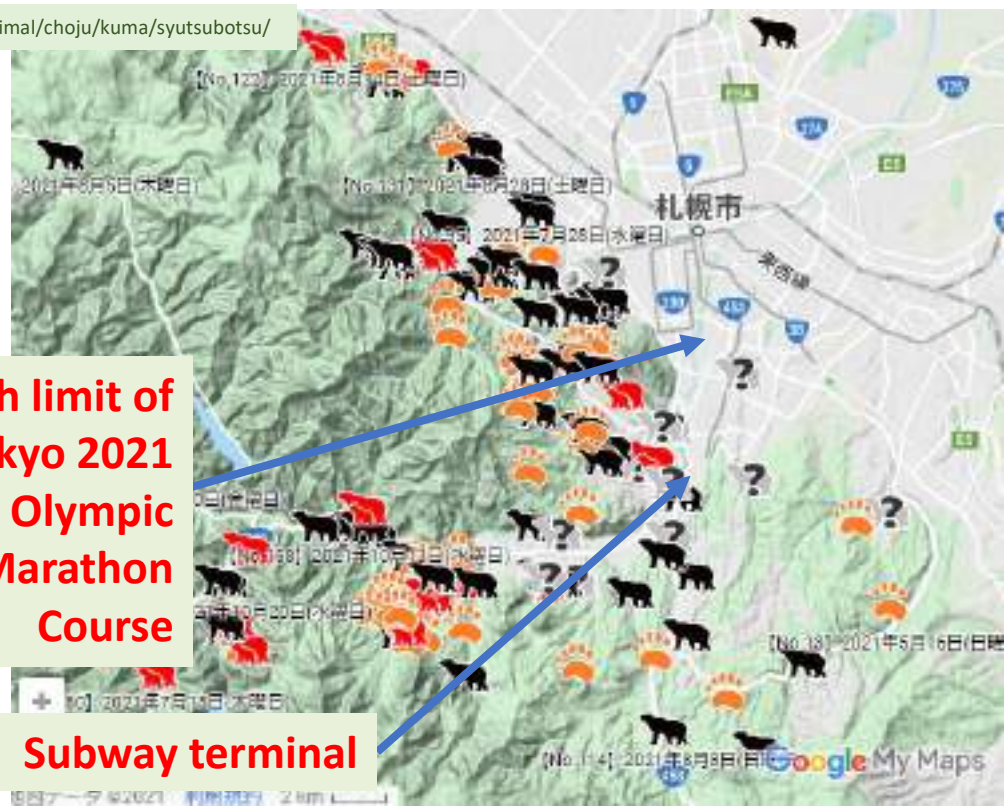
December 31, 2018



- Overabundant Deer, No Municipal Program
- Town-, City- or Village-run Deer Management or Research Program



Map of brown bear appearance in Sapporo residential areas. Killing nuisance bears is strongly protested by citizens outside Hokkaido.



- Unlike deer, bear may kill people, and appearance of bears in the city area limits children going to school and stopping marathon events. Sapporo City wrote, "Before gathering information on brown bear from the websites and stay away from the their home range to avoid encountering brown bears", even where in residential urban areas.

# Basic concept of bear management

- “Good bears” avoid people, even if their home range includes highways and close to residential areas, which alone is not dangerous.
- Bears will not avoid people if they eat garbage left by people. “We have no choice but to remove fed bears.” “A fed bear is a dead bear” (Yellowstone National Park slogan\*).
- *Prevent wildlife from becoming nuisance (e.g. fencing). The capture itself may also help prevent nuisance.*

People and bears are *not* friends, but **can coexist by fearing each other** (H.M.)



OECMは生物多様性の主流化を促す

## OECM promote mainstreaming of biodiversity

- 生物多様性は、保護地域に加えてOECMに取り組むことで、生物多様性保全を主目的としないが「生物多様性に配慮する」すべての関係者の問題となりうる。 > より多くの人々が生物多様性を主目的に考える

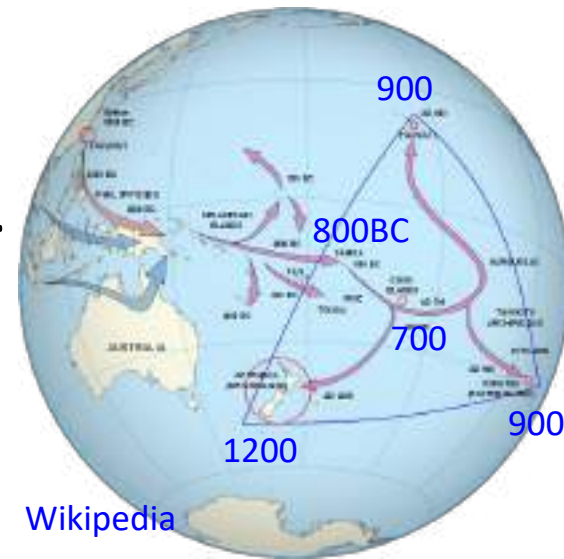
Biodiversity could be a matter of all stakeholders who are not primarily concerned with biodiversity conservation but “care for biodiversity” by addressing the OECMs in addition to protected areas [> “More people think about biodiversity as a primary objective”].

- 気候変動は、緩和策に加えて適応策に取り組むことで、気候変動で影響を受ける非常に多くの関係者の問題となった。

Climate change has become a matter of concern for a very large number of stakeholders affected by climate change by addressing adaptation measures in addition to mitigation measures.

# How did Moai in Easter Island end? (Diamond 1995 Discover Magazine)

- Early 5c: First Polynesian settlement, forests were rich.
- 5th - 17th century: Moai statues were built
- 17c: Forests lost due to over logging by natives. There will be no more wood for canoes. No more fishing. Loss of technology, culture, and history of making moai statues. Declining population due to severe food shortages.
- 18c: Westerners reach Indigenous people who do not know history.
- *Global loss of biodiversity will result in human extinction? No! But longer enjoy good QOL.*



\* QOL = quality of life

# Today topics

- World Heritage and Biosphere Reserves
- SDGs (Sustainable Development Goals)
- Ecosystem Services, Nature's Contributions to People
- 30by30 and OECM (Other Effective area-based Conservation Measures)
- Reaction to Pre-lecture exercise and further exercise



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Educational, Scientific and  
Cultural Organization



Man and  
the Biosphere  
programme



Sustainable  
Development  
Goals



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# Further exercise. Discuss and make your opinion!

1. Do you think 30by30 feasible? And why?
2. If yes, what is a key to achieve it? If not, what is alternative goals or why was it made?
3. Does OECM lead to diminish the quality of conservation movement or effective in mainstreaming conservation? And why?
4. What should be the post-SDGs? Should it incorporate measures to address pandemics and population growth? And why?
5. Should the post SDGs aim for greater ambition or prioritize pragmatic goals? And why?

These answers are made by generative AI. Make better answers.

- Biosphere Reserves are internationally designated areas operated by UNESCO's Man and the Biosphere Program, aiming to harmonize the conservation of biodiversity, socioeconomic development, and scientific study, serving as models for achieving a balance between human activity and nature. It consists of core areas surrounded buffer zone and transition areas.

- The Sustainable Development Goals (SDGs) are a set of 17 global objectives established by the United Nations in 2015. They aim to address various global challenges by 2030, including poverty, inequality, climate change, and environmental degradation, to create a more sustainable and equitable world for all.

- Other Effective Area-Based Conservation Measures (OECMs) are conservation strategies acknowledged by the Convention on Biological Diversity, designed to complement traditional protected areas. OECMs focus on bolstering ecosystem resilience and empowering local communities, playing a crucial role in the broader objective of conserving 30% of the land and sea by 2030.