I=PAT
vs.
Satoyama

-- Paradigms of SD Indicators

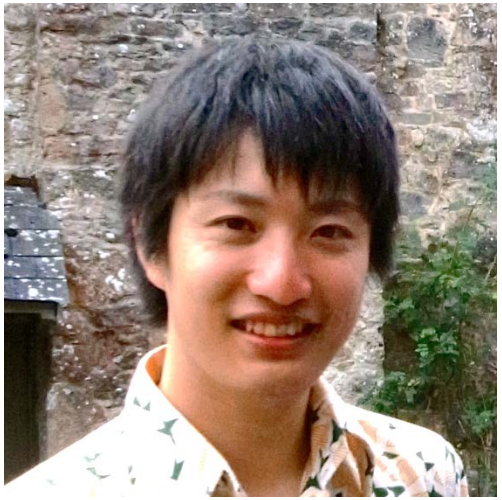
Shun SATO (Chiba University)

2016-05-13 fri. IAIA @Nagoya

15min.+QA

※ SD: Sustainable Development ≒ Sustainability

Author's Bio



Shun Sato is a PhD student at Chiba Univ GSHSS.

He studies theories and roles of SD Indicators.

Bachelor's degree: integrated human studies, Kyoto Univ.

Master's degree: global environmental studies, Kyoto Univ.

Summary Statement

Many previous sustainable development / sustainability indicators are based on I=PAT model (environmental Impact = Population * Affluence * Technology), though SATOYAMA model (human interventions play good roles) is also needed.

Today's Topics

1) What's I=PAT ?
2) What's Satoyama ?
3) Examples of some SD Indicators
4) Discussion
    1) Sustainability Indicators: why I=PAT model ?
    2) Relationships between Human & Nature: is Satoyama model new paradigm?

Conceptual level

please think together :)

What's I=PAT ?

I=PAT equation

I: environmental Impact

human impact on the environment

P: Population

population size

A: Affluence

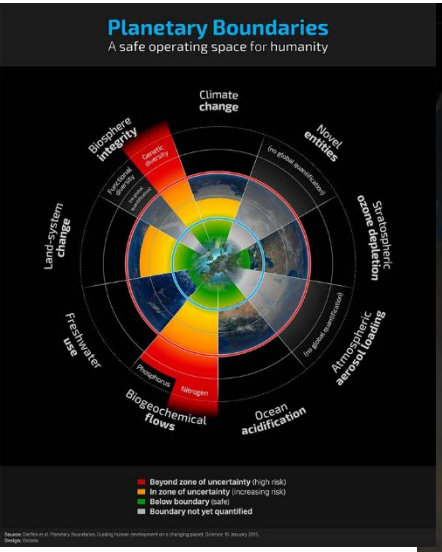
goods consumed per capita

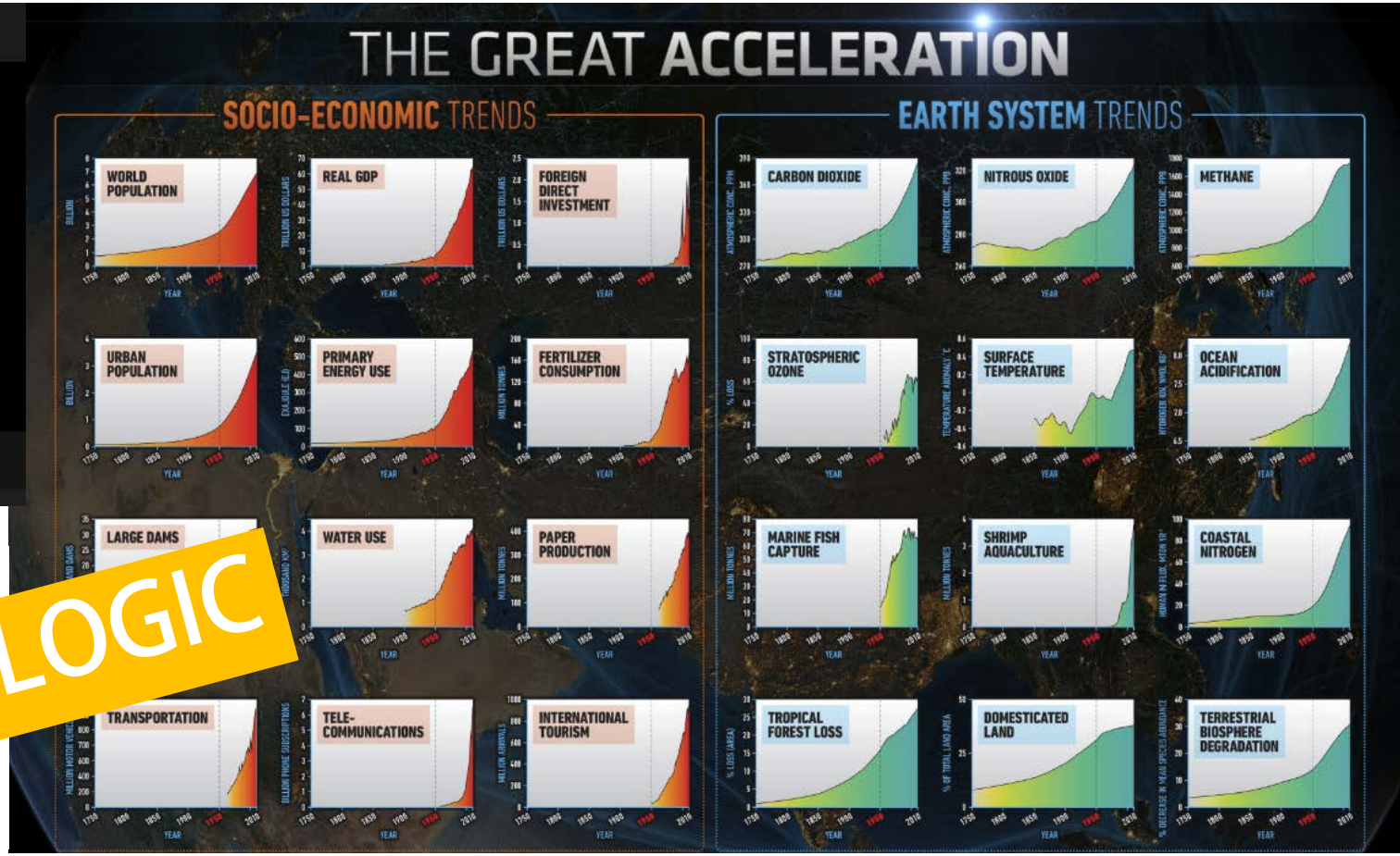
T: Technology

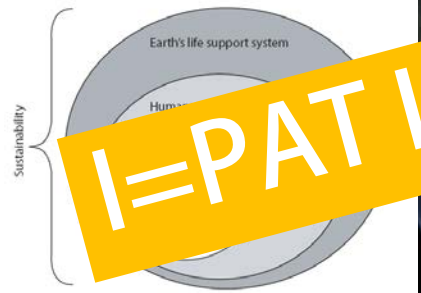
pollution generated by technology per consumed

cf. Kaya Identity (Yoichi KAYA) in IPCC Report

$$\mathrm{CO_2Emission} = \frac{CO_2}{\mathrm{Ener}gy} \times \frac{\mathrm{Energy}}{\mathrm{GDP}} \times \frac{GDP}{\mathrm{Population}} \times \mathrm{Population}$$







I=PAT LOGIC

Planetary Boundaries (2009;2015)

Johan Rockström (2015) **ver.1** **ver.2**

Bounding the Planetary Future: Why We Need a Great Transition
http://www.greattransition.org/publication/bounding-the-planetary-future-why-we-need-a-great-transition

▼ PAT

(Human activity)

Planetary Boundaries (2009;2015)

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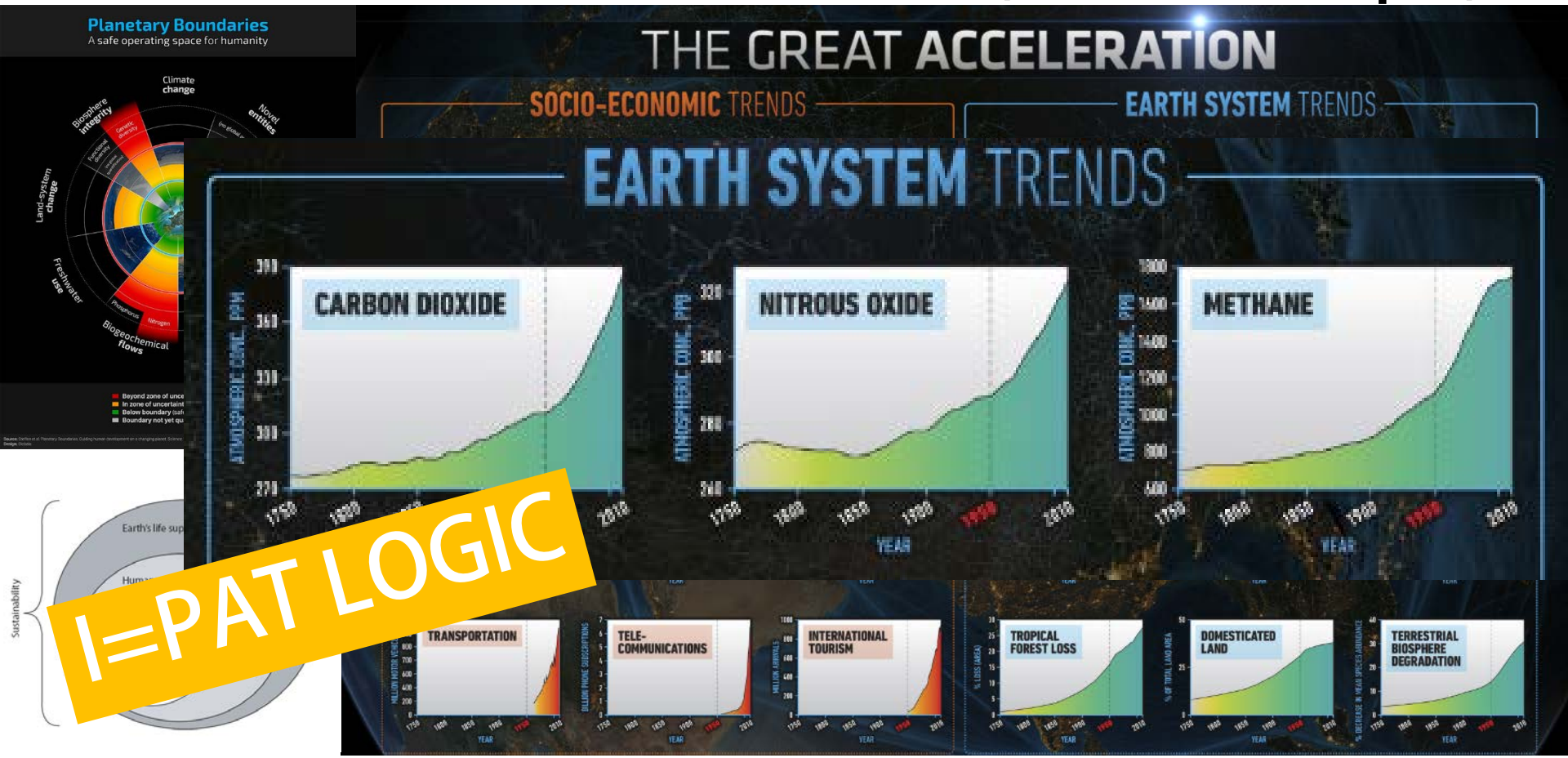
(Environmental Impact)



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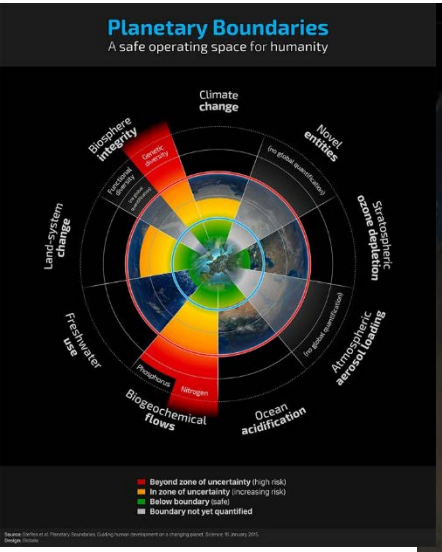
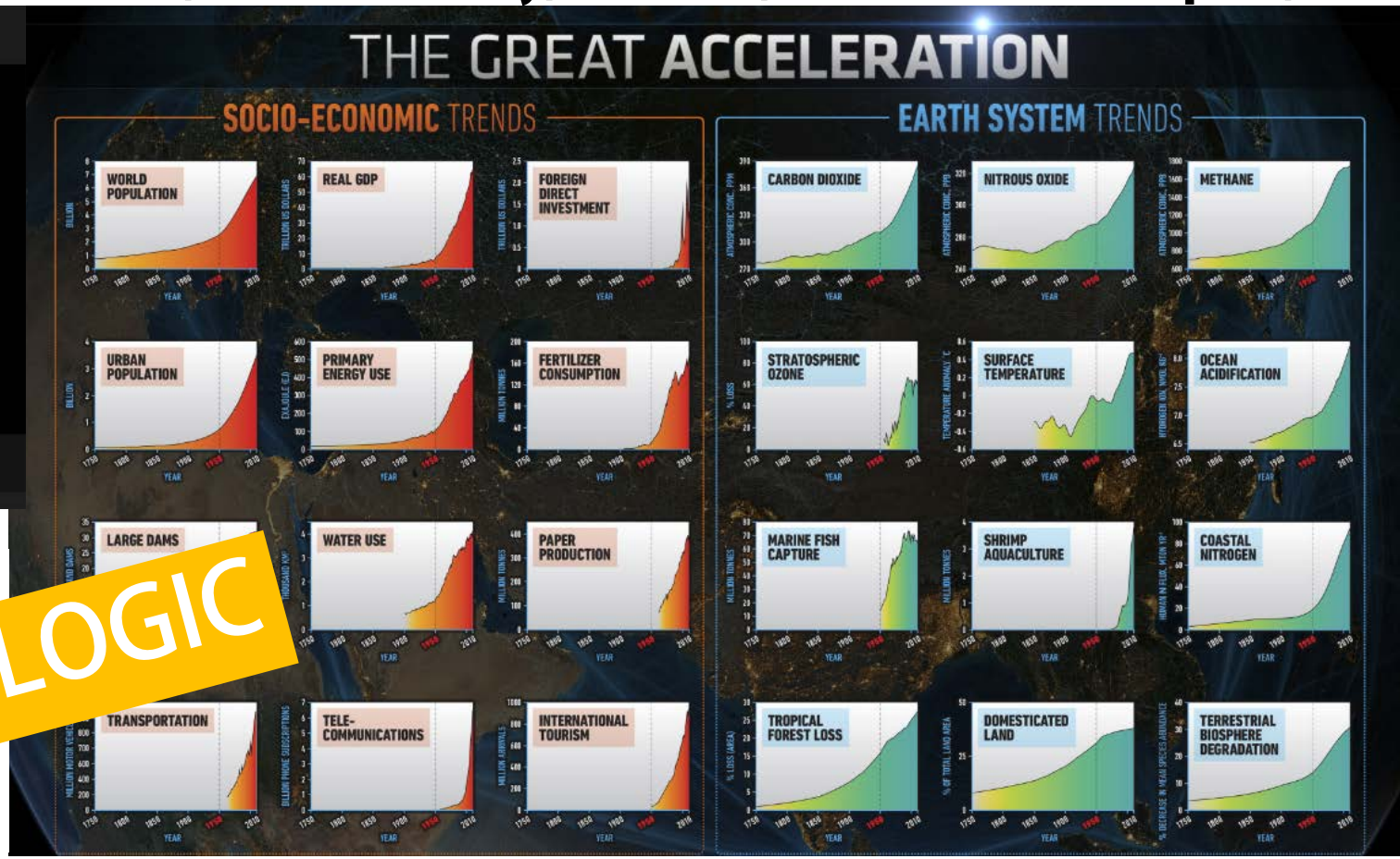
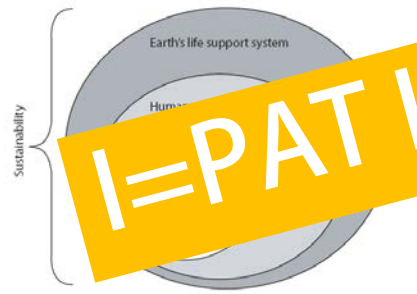
▼PAT (Human activity)

▼I (Environmental Impact)







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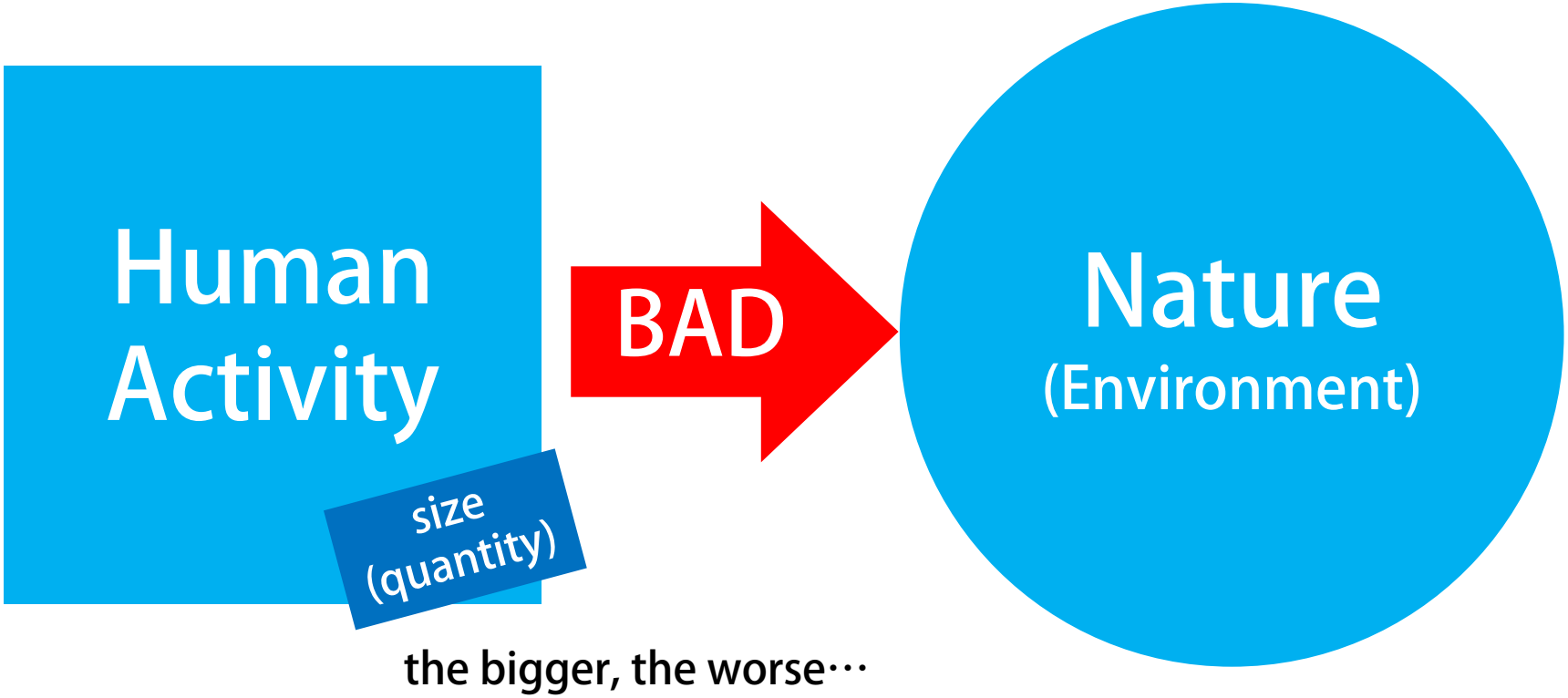
I=PAT



the bigger, the worse…

What's SATOYAMA ?

←these gradation area→

SATO さと

里

YAMA やま

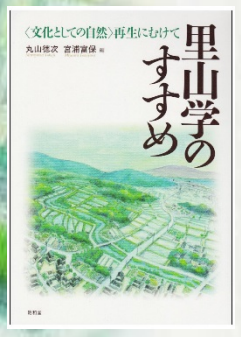
山

＝mountain

＝rural town

田＝paddy field
(with human intervention)

土＝ soil



Maruyama (2007)

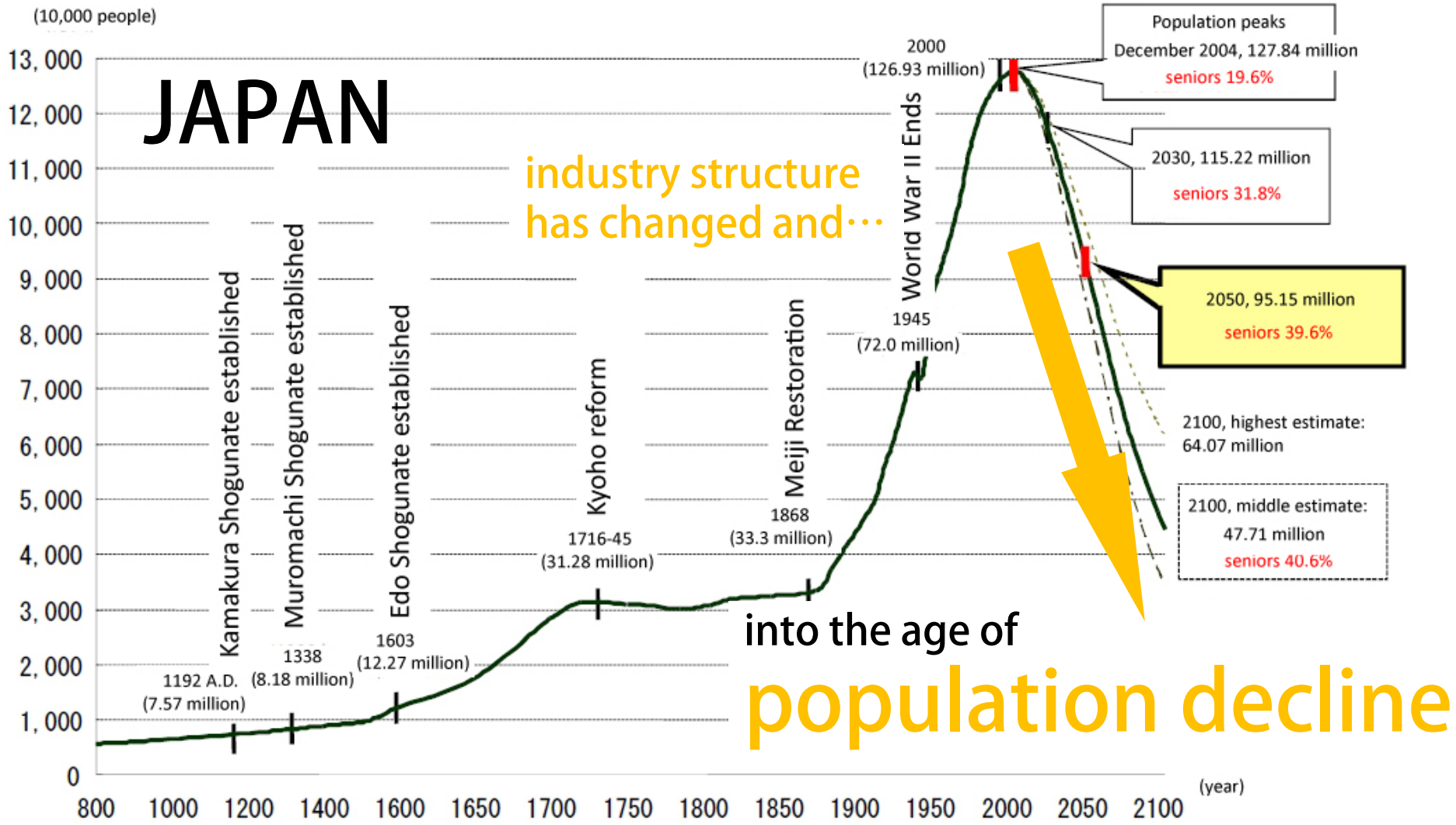
We Care and Use Natural Stocks

New Harmonized Ecosystem
(Ecological Cycle)

6F

Food
Fiber
Feed
Fertilizer
Fuel
Forest

IPSI THE INTERNATIONAL PARTNERSHIP FOR THE SATOYAMA INITIATIVE



Source: Prepared by the National and Regional Planning Bureau, Ministry of Land, Infrastructure, Transport and Tourism, based on "Population Census" by the Ministry of Internal Affairs and Communications (MIC), "Population Estimates" by MIC, "Intercensal Adjustment of Current Population Estimates (2000-2005)" by MIC, "Population Projections for Japan: 2006-2055: Outline of Results, Methods, and Assumptions" by the National Institute of Population and Social Security Research, and "Long-term Time-series Analysis of Population Distribution Change in the Japanese Archipelago (1974)" by the National Land Agency.

Social Vision in an Era of Population Decline from the Perspective of Local Economy and Well-being | Japan for Sustainability
http://www.japanfs.org/en/news/archives/news_id034791.html

The National Biodiversity Strategy of Japan 2012-2020

Roadmap towards the Establishment of an Enriching Society in Harmony with Nature

Section 3 The structure of the biodiversity crisis.....

1 First crisis (caused by human activities including development).

2 Second crisis (caused by reduced human activities).....

3 Third crisis (caused by artificially-introduced factors) .....

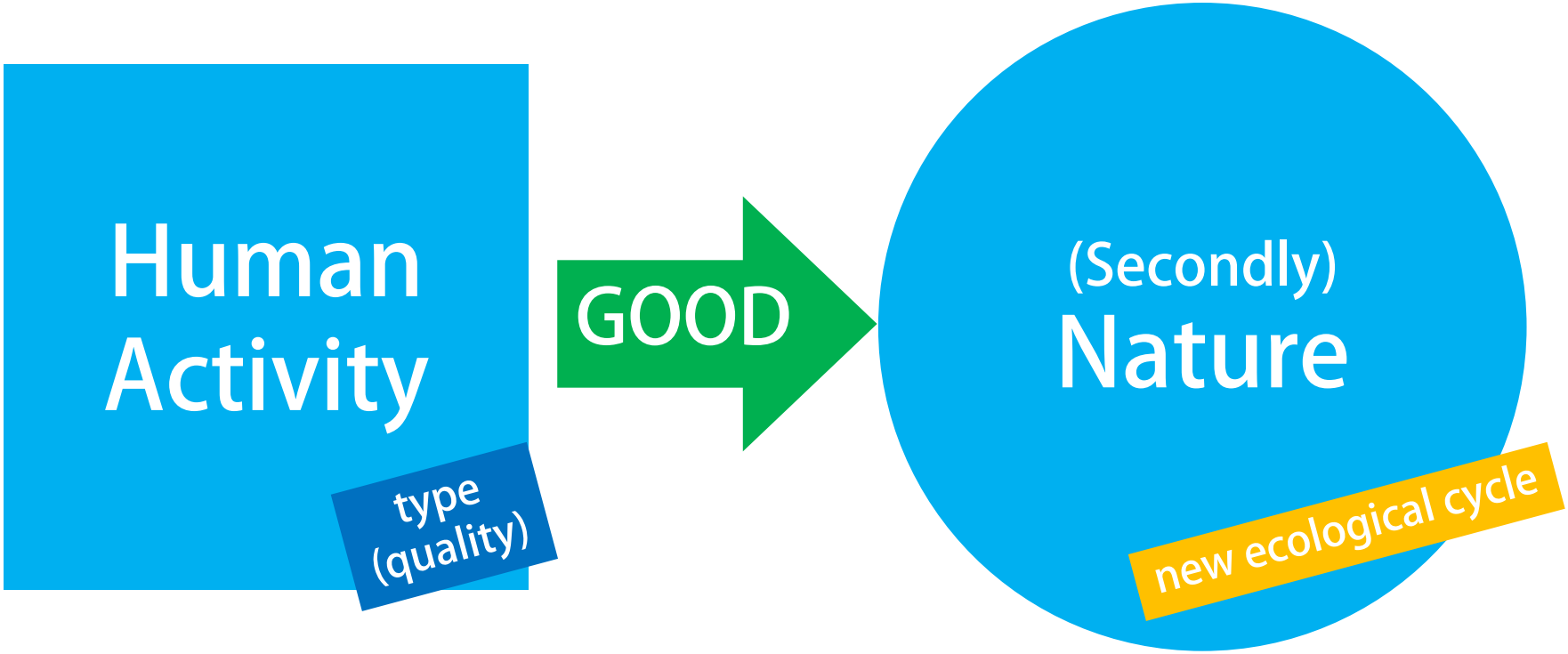
4 Fourth crisis (caused by changes in the global environment).....

CRISIS

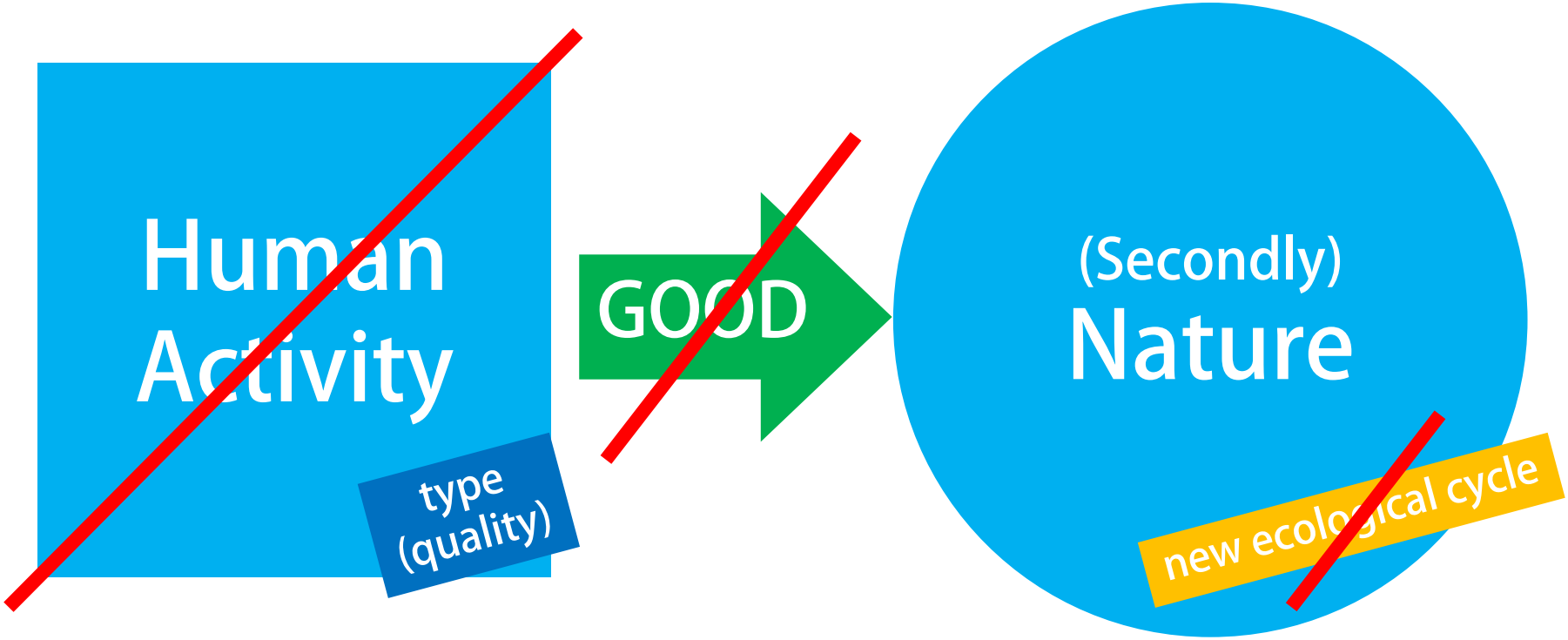
collapse ecological harmony

harm to human timber production/agriculture

Satoyama


Human Activity
type (quality)
GOOD
(Secondly)
Nature
new ecological cycle

Satoyama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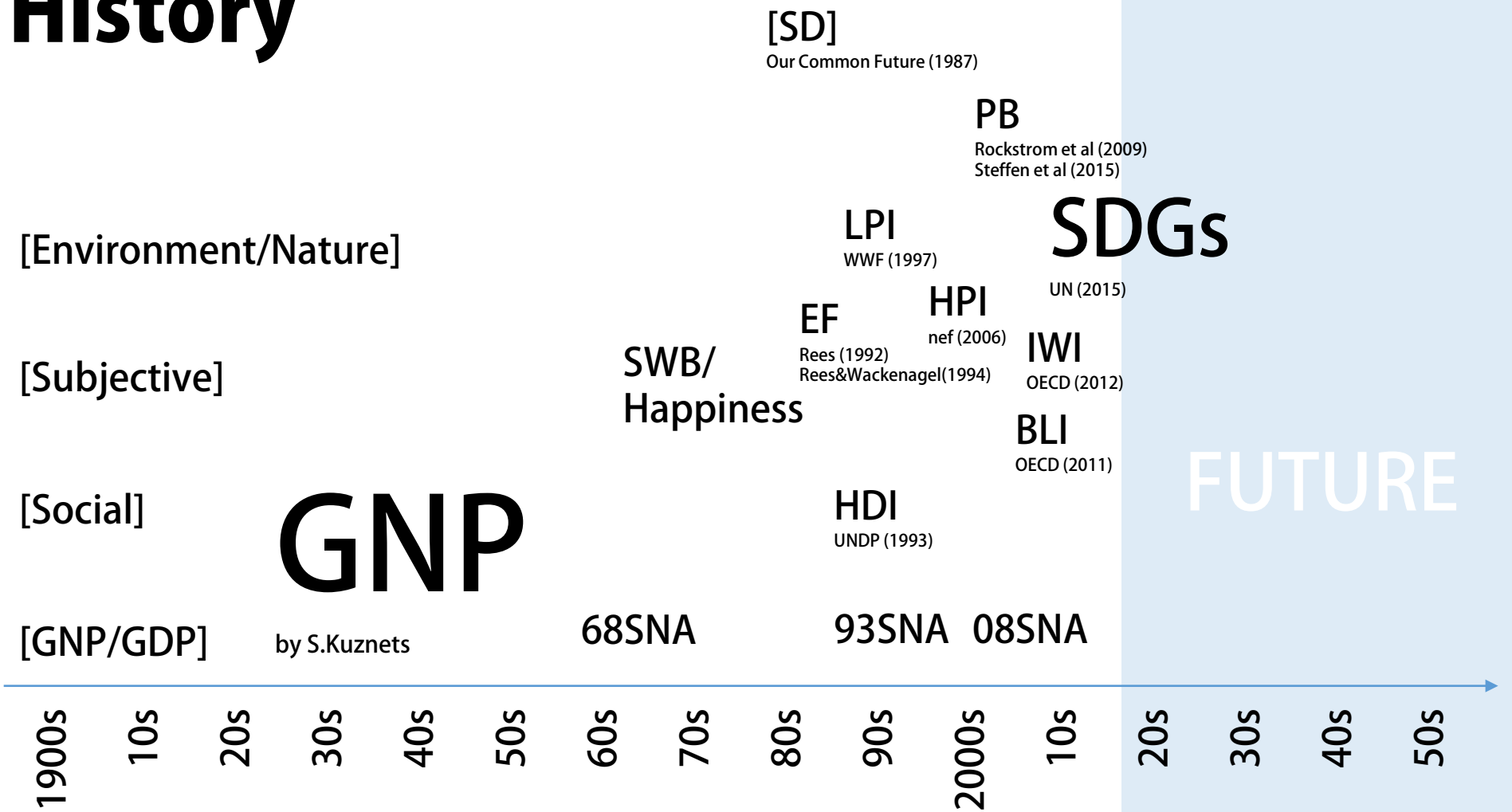
Examples of some SD Indicators

Thesedays

History

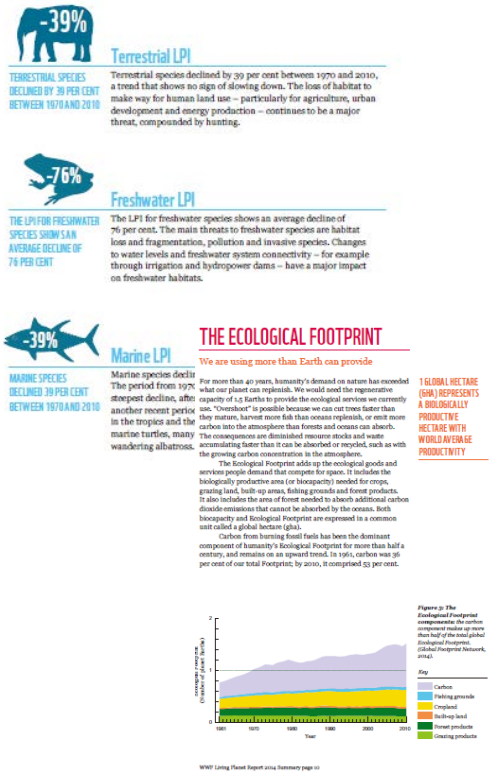

[SD]
Our Common Future (1987)
PB
Rockstrom et al (2009)
Steffen et al (2015)
LPI
WWF (1997)
SDGs
UN (2015)
[Environment/Nature]
EF
Rees (1992)
Rees&Wackenagel(1994)
HPI
nef (2006)
IWI
OECD (2012)
[Subjective]
SWB/
Happiness
BLI
OECD (2011)
FUTURE
[Social]
GNP
HDI
UNDP (1993)
[GNP/GDP]
by S.Kuznets
68SNA
93SNA
08SNA
1900s
10s
20s
30s
40s
50s
60s
70s
80s
90s
2000s
10s
20s
30s
40s
50s

SDGs (2015)
:Sustainable Development Goals

2016=>2030

17 Goals
169 Targets
many Indicators

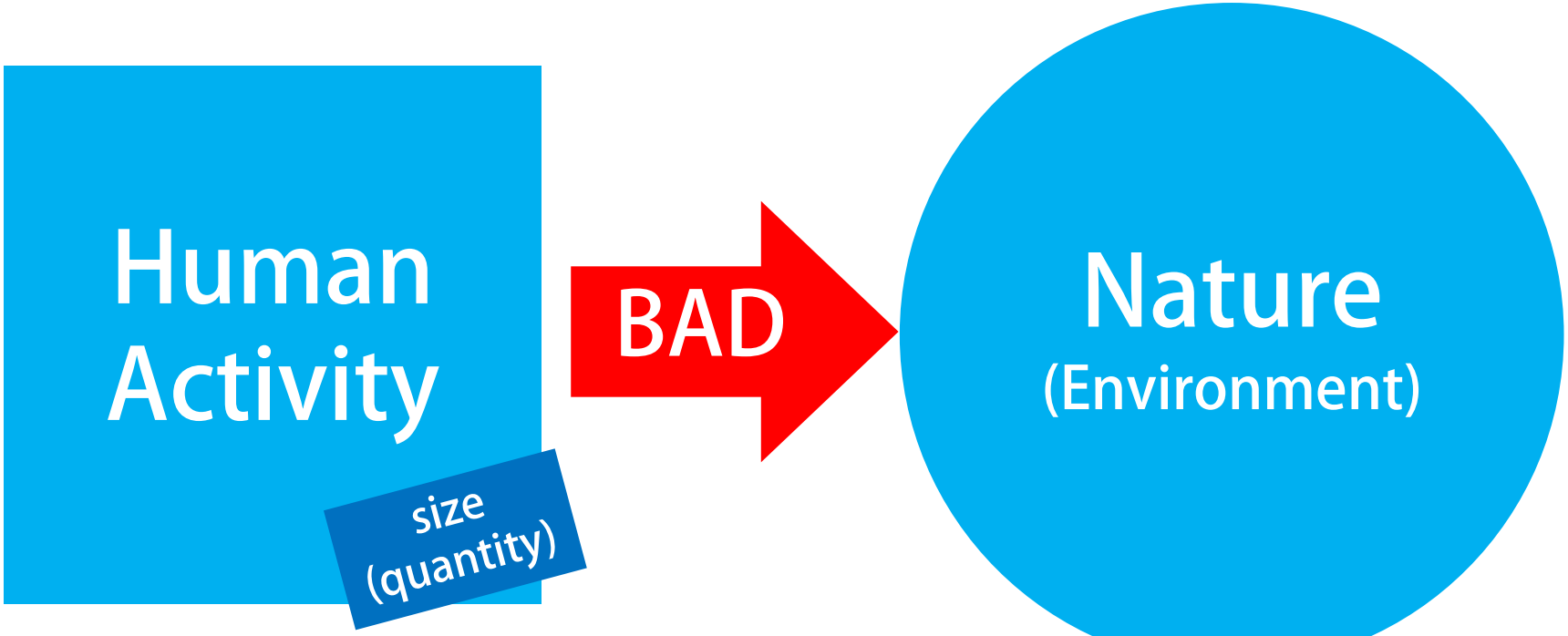
LPI: Living Planet Index
EF: Ecological Footprint
PB: Planetary Boundaries
(DE: Doughnut Economics)



WWF (2014)

These are mainly based on

I=PAT model

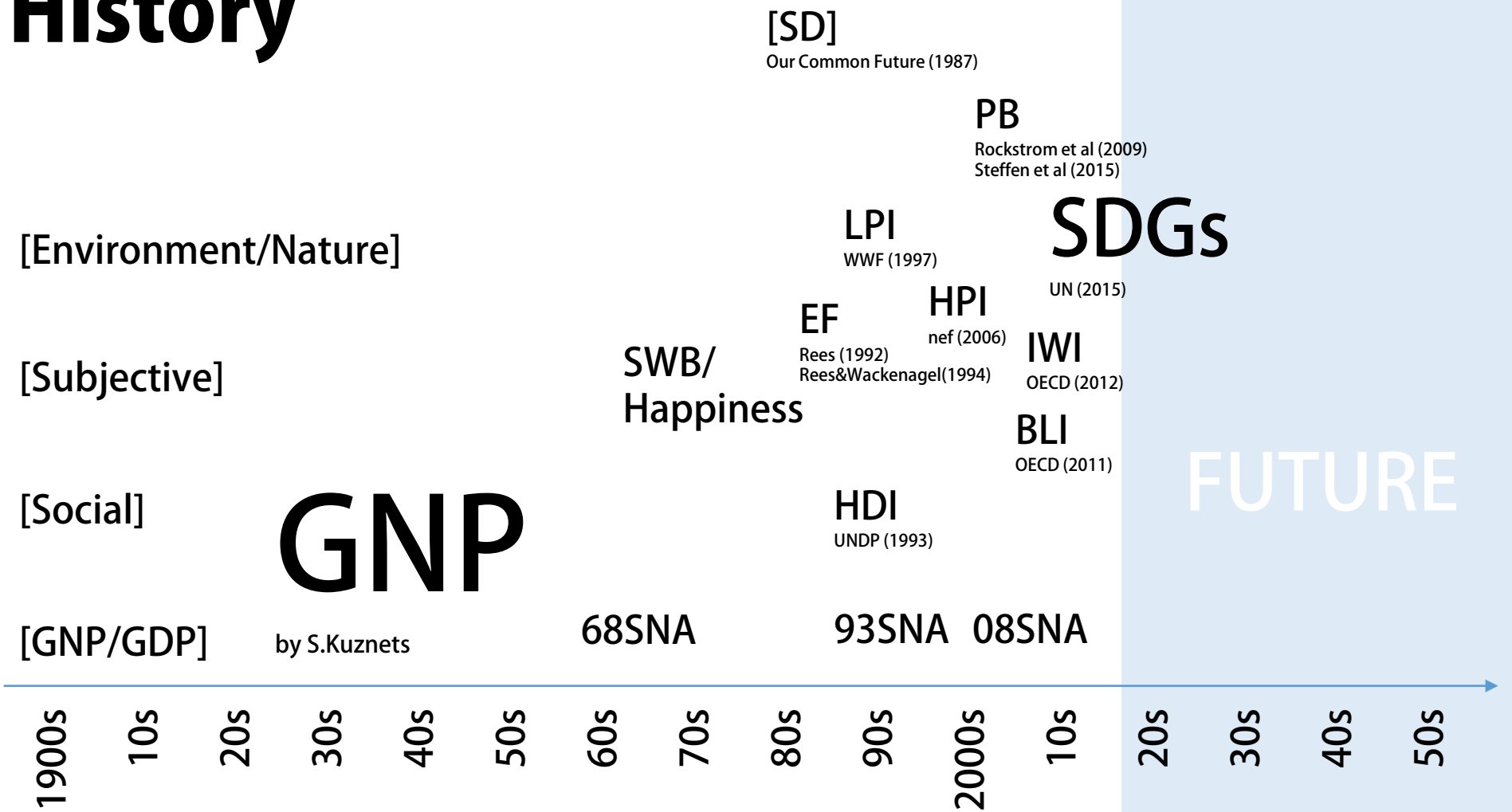


the bigger, the worse…

DISCUSSION (1)

why I=PAT model ?

History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History

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68SNA

93SNA

08SNA

1900s 10s 20s 30s 40s 50s 60s 70s 80s 90s 2000s 10s 20s 30s 40s 50s

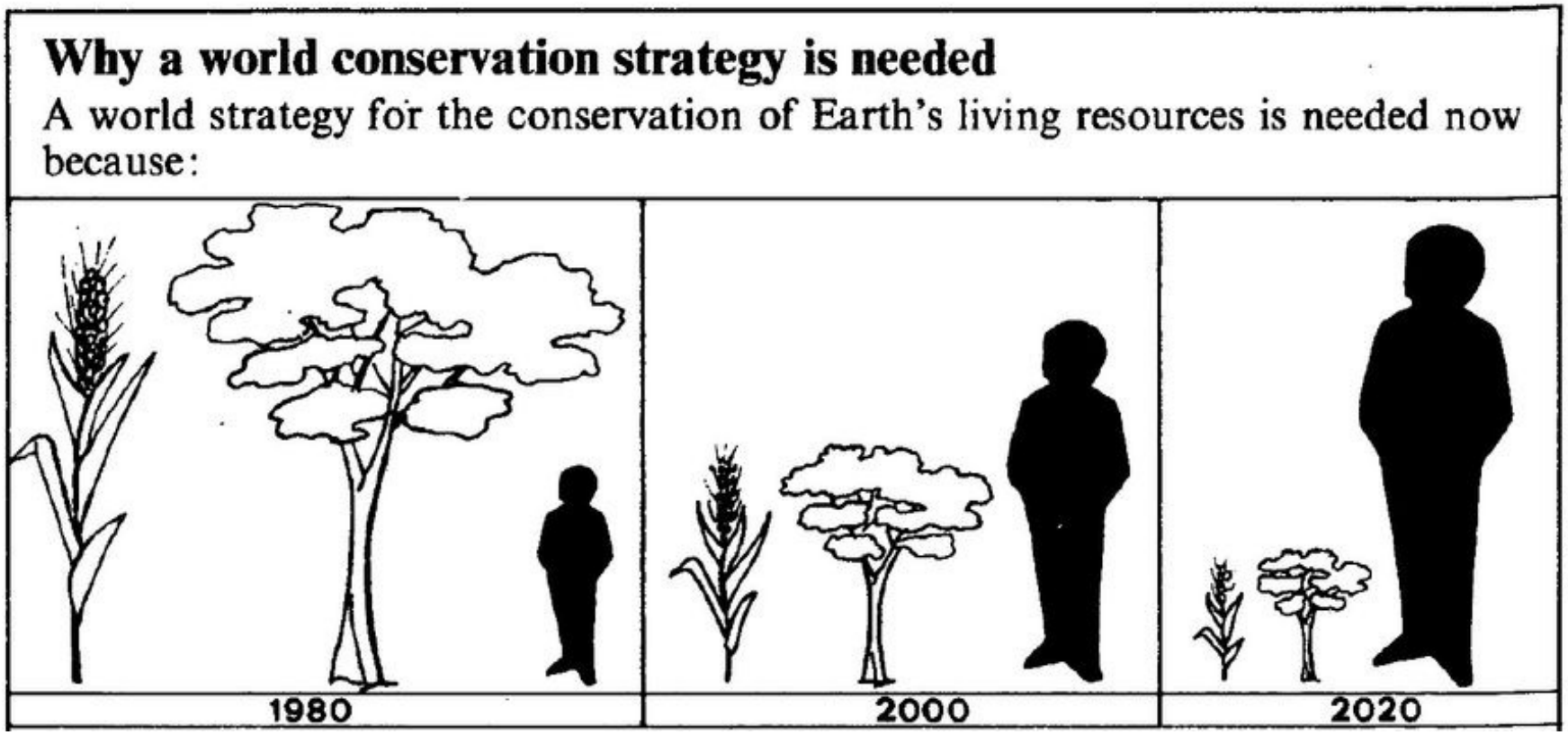
[World Population]

Population Bomb

1.6B 2.5B 5B 6B 7B 9B

IUCN et al.(1980)
World Conservation Strategy

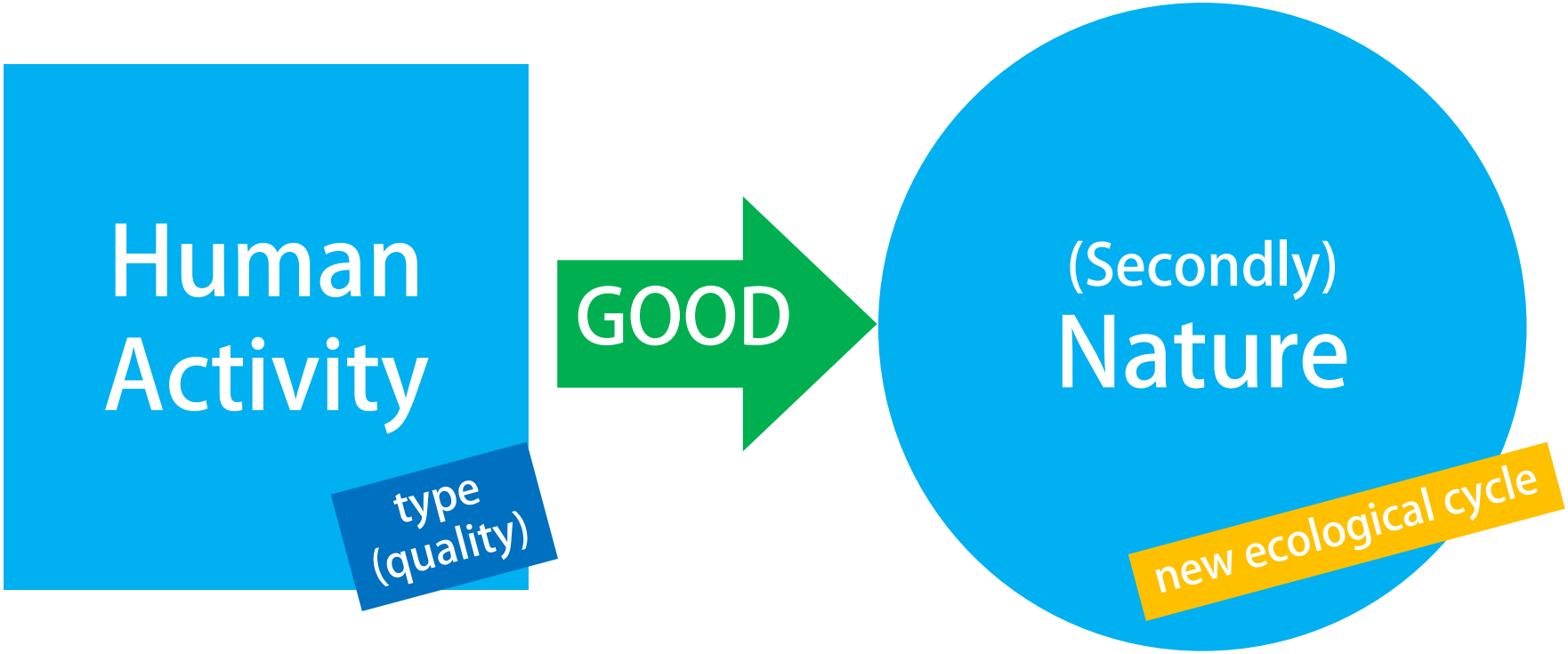
the term “Sustainable Development” first used in the international context
increasing population was the big problem



DISCUSSION (2)

about Human and Nature

Satoyama


Human Activity
type (quality)
GOOD
(Secondly)
Nature
new ecological cycle

SATOYAMA

level concept ? => No !!

Satoyama model
= a new paradigm

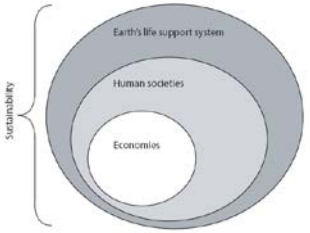
I: Human AND Nature

nature is just an outer separated resource

I=PAT

II: Human IN Nature

← now main paradigm



nature (earth) is our fundamental base

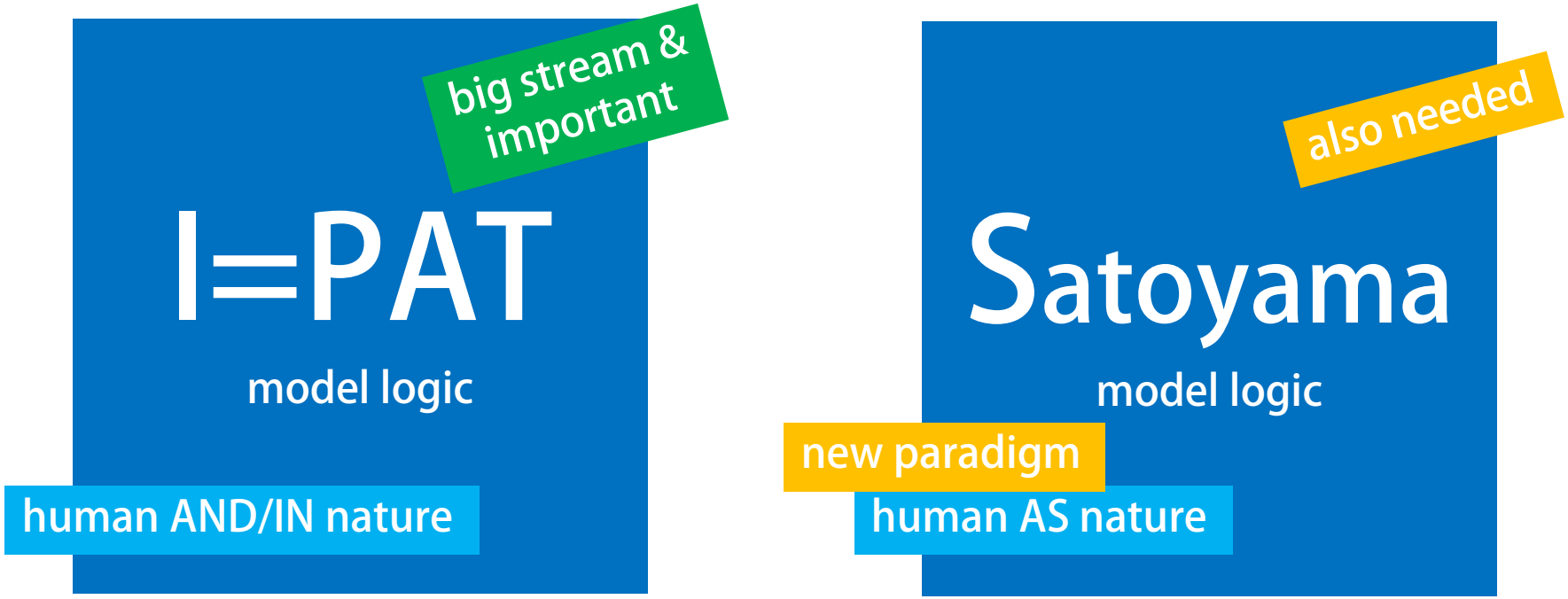
III: Human AS Nature

=Satoyama

we human are part of nature
our activity can be a part of (new harmonized) ecological cycle

Conclusion

Summary Statement



Many previous sustainable development / sustainability indicators are based on I=PAT model (environmental Impact = Population * Affluence * Technology), though SATOYAMA model (human interventions play good roles) is also needed.

Implication
for Impact Assessment

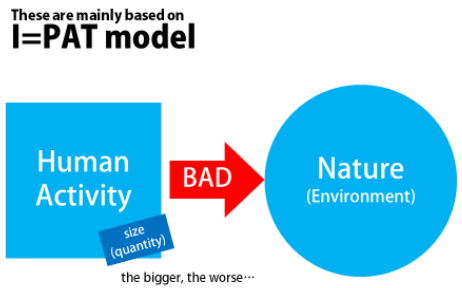
We should consider…

Demographic Change(now&future)

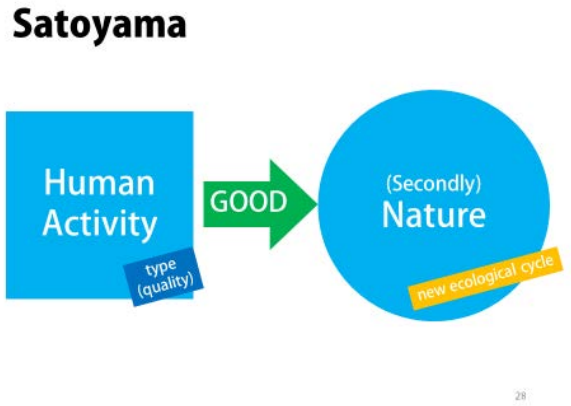
- Increasing / Decreasing
- Aging

Both Impact

- Good Impact / Bad Impact



and we may actively **make** positive impacts



Thanks

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facebook/ linkedin

Appendix

Discussion Point

I am wondering…

Satoyama logic model is…

- only for
  - Japan ? (other country?)
  - local level ? (national/ regional/ global/ universal level?)
  - rural area ? (urban area?)
- really
  - paradigm level ?
  - only technical level ? (e.g. I=PAT, T<0)

Additional IDEA

Neo-Satoyama

cf. Urban mine

cf. Man-made naturally-regenerating forest

Definitions of SD

1) Our Common Future (1987)

Needs, Present generation, Future generation

2) Triple Bottom Line (+ α)

Environment, Society, Economy (+ Well-being…)

3) Herman Daly's Principles

Renewable resources, Non-renewable resources, Waste absorption

4) Non-decline of well-being

Headonic well-being, Evaluative well-being, Eudaimoniac well-being

5) Non-decline of productive base

capital assets, enabling assets

6) Non-decline of population

Stiglitz, Sen, Fittousi (2009; 2010)

Beyond GDP

1) improve GDP
2) measure Quality of Life
3) measure Sustainability

Roles of Indicators

1) Instrumental role
2) Conceptual role
3) Political role

EU FP7 Research Project

POINT: policy influence on indicators

BRAINPOOL: bringing alternative indicators into policy