

Contribution of Biosphere Reserve Toward Achieving Sustainable Development Goals and Targets

Endang Sukara
 Research Center for Biotechnology – Indonesian Institute of Sciences (LIPI)
 Member of the Indonesian Academy of Sciences
 Vice Chair of Indonesian Biodiversity Foundation (KEHATI)
 Faculty Member of National University, Jakarta
 Member of the Indonesian Committee for MAB Program, Indonesia


Regional Workshop - Facility for Accelerating Science and Technology (FAST) to Foster the Implementation of the Sustainable Development Goals, Timor-




SDGs: End poverty, End hunger, Healthy Lives, Water and Sanitation, Energy, Sustainable Economic Growth, Sustainable Consumption and Production, Climate Change, Marine resources, Terrestrial Ecosystems, Desertification, Biodiversity loss etc. (17 Goals/162 Target)

.. **BIODIVERSITY** is a fundamental to sustain the function of ecosystem and to protect Earth Planet, to maintain life, to provide food, medicine, energy and other human need, to manage water, nutrient cycles, formation of soil, fixing carbon, maintaining global climate, spiritual sources, education, development of sciences, aesthetics ...





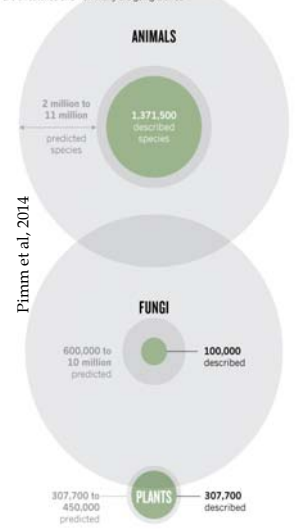
Earth and Biodiversity



1. Biodiversity exist on Earth resulting from over 3 billion years of natural selection - efficiency, productivity and specialization.
2. Biodiversity is catalyst that:
 - a) capture and transform energy and materials, producing food, fuel, fibre and medicines;
 - b) recycle wastes, create pure drinking water, drive global biogeochemical cycles that create and maintain an aerobic atmosphere, regulate global climate;
 - c) generate soil fertility, and provide other ecosystem goods and services

How many species are there?


Estimates of the number of species of animals, fungi and plants vary significantly. That uncertainty clouds understanding of how many species are threatened and how many are going extinct.



Pimm et al., 2014

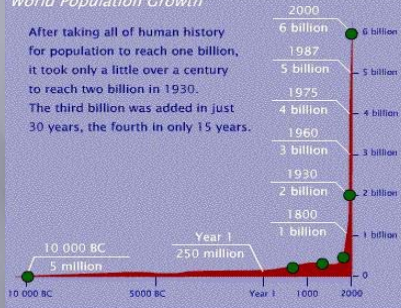
Earth is the only place for human being to live; It is very fragile and need our full commitment to protect and maintain to ensure its sustainability;

We must decide where to go ? We must set for a New Standard – Born for extinction or saved for survival (Halmark, 2008)

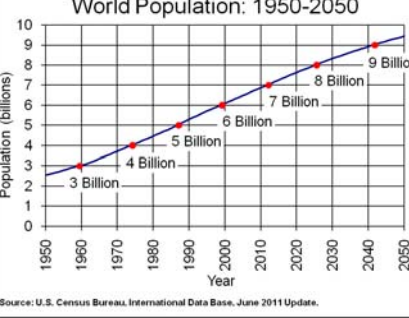


World Population Growth

After taking all of human history for population to reach one billion, it took only a little over a century to reach two billion in 1930. The third billion was added in just 30 years, the fourth in only 15 years.



World Population: 1950-2050



Source: U.S. Census Bureau, International Data Base, June 2011 Update.

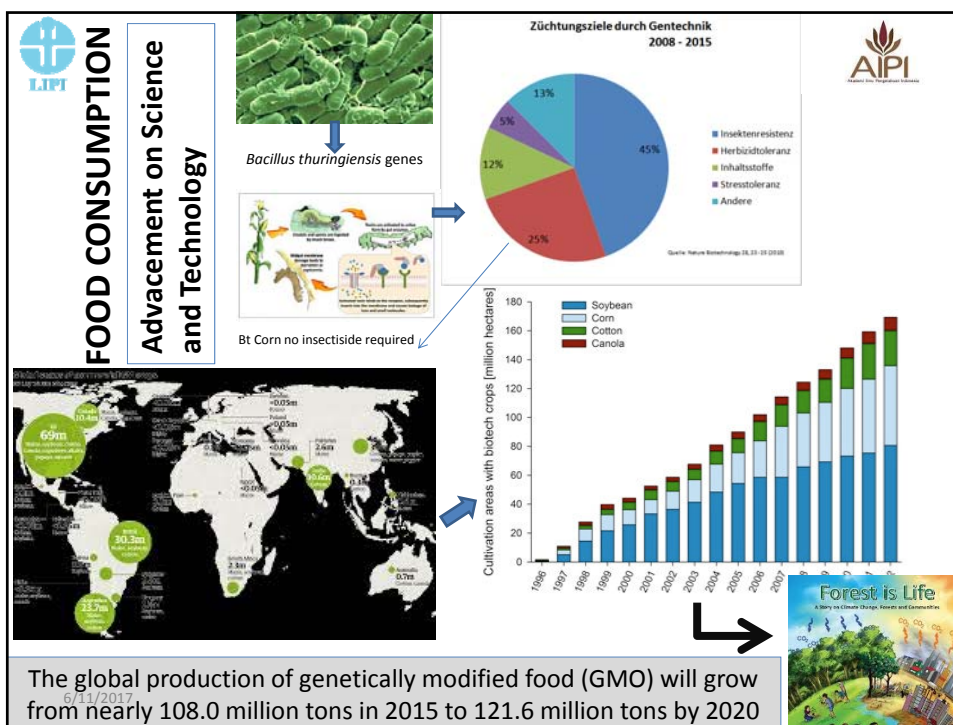
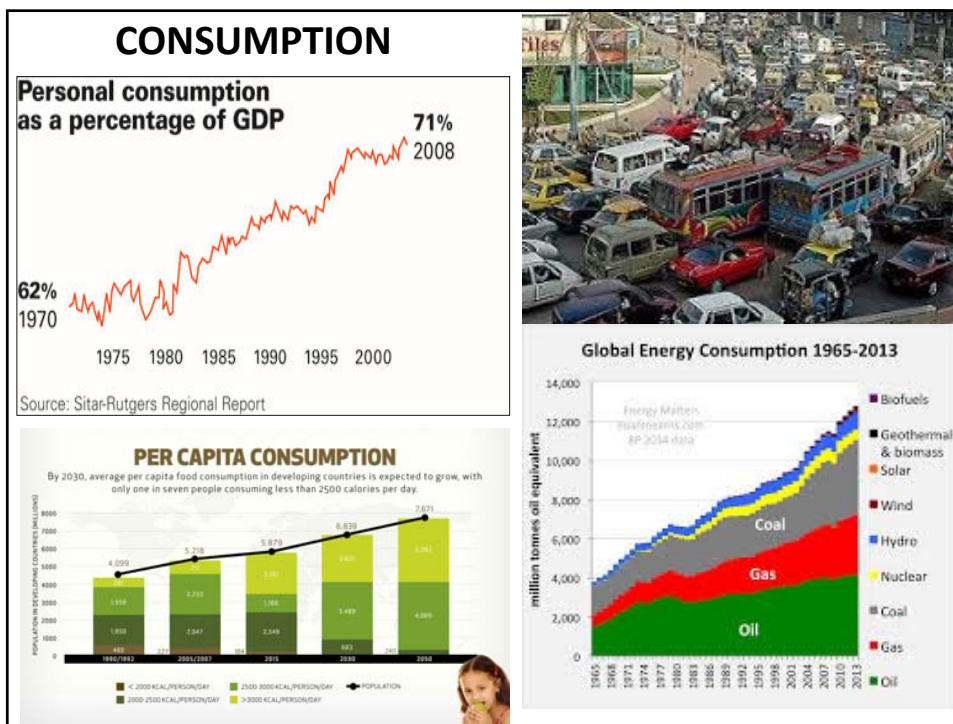
Humanity faces profound questions over how our planet can sustain and feed 9 billion people by 2050. Meanwhile, climate change has major implications and impacts on food security, access to clean water and sanitation, and the threat of an increased number of natural disasters.

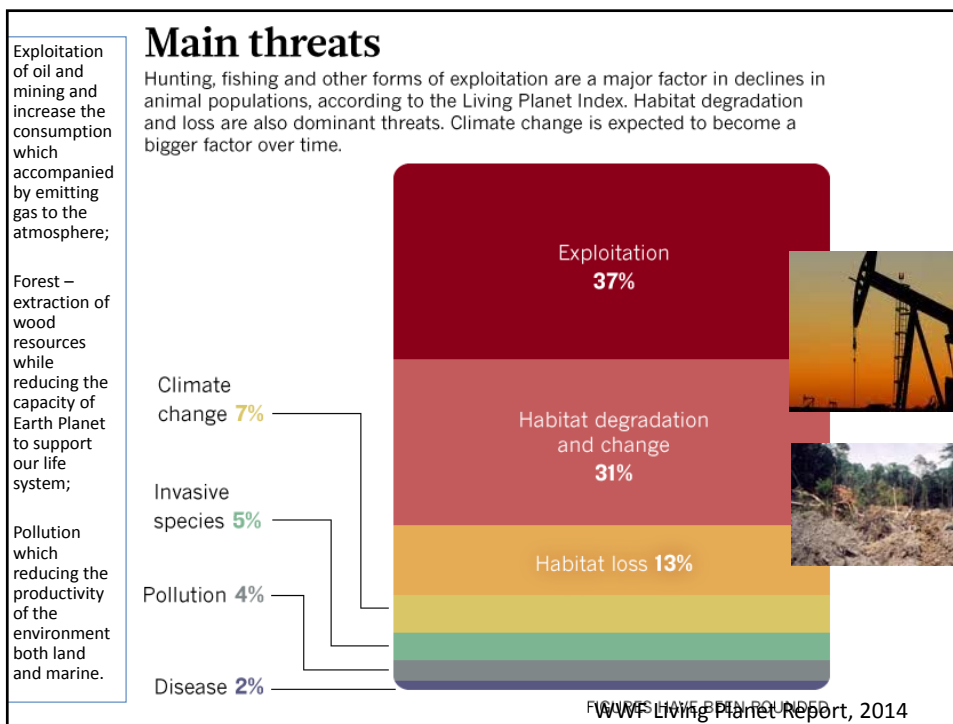
Expansion of agricultural land using conventional crops through the conversion of forest leading to tremendous loss of biodiversity including those which can be used as food, health and energy alternative for the future of human kind and reduction of environment capacity in providing services for our survival.

Need political and science and technological innovation to conserve and sustainable use of biodiversity in providing solution to food, health and energy. Conservation and sustainable use of its services is mandatory.

GSS Seminar Kyoto University - Japan

4





SEA DEBRIS



In recent years plastic pollution in the ocean has become a significant environmental concern; Six years research of Gyres Institute estimated that over 5 trillion plastic particles are floating on the surface of the sea.






https://www.google.com/search?q=pencemaran+laut&source=lnms&tbm=isch&sa=X&ved=0CAcQ_AUoAWoVChMI6Z6ovq7UxwIVyuOCh0XyAcl



Sangata river – East Kalimantan

SEA DEBRIS




loss of light affecting habitat zones

large urchins
healthy kelp
dense canopy
many sponges
high variety

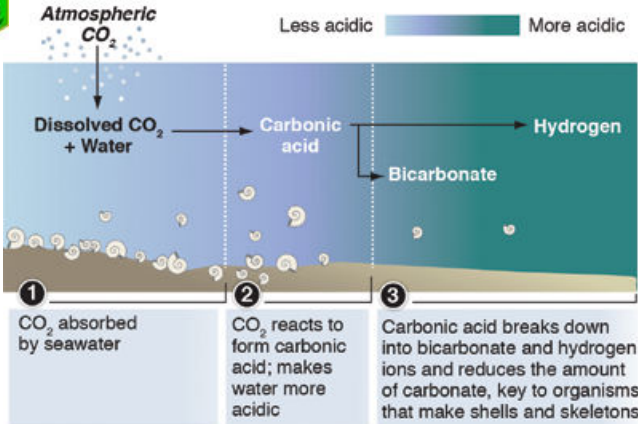
small urchins
small kelp
open canopy
some sponges
low variety

no urchins
no kelp
bladder weeds
open canopy
no sponges
very low variety

Ludwig, C. Et al. 2015



OCEAN ACIDIFICATION



Less acidic More acidic

1 CO₂ absorbed by seawater

2 CO₂ reacts to form carbonic acid; makes water more acidic

3 Carbonic acid breaks down into bicarbonate and hydrogen ions and reduces the amount of carbonate, key to organisms that make shells and skeletons


How acidity affects marine life

- Depletes oceans of compound that clams, coral, plankton, other creatures need to build shells, skeletons
- Fish, other organisms can develop metabolic, immune, reproductive problems
- Kills off food for animals at higher end of food chain

Source: University of Maryland, Center for Biological Diversity

© 2010 MCT

Ludwig, C. Et al. 2015




Biodiversity Loss

Rising extinction rates
(based on Norman Meyers, *The Sinking Ark* - 1980)


70 million years ago	1 per 1000 years
1600-1900	1 every 4 years
1900-1980	1 per year
1980	1 per day
2000	100 per day

The loss of biodiversity will diminish the capacity of ecosystems to provide society with a stable and sustainable supply of essential goods and services



Why the lost of biological diversity must be stopped ?

The worst thing that can happen – will happen in the 1980s – is not energy depletion, economic collapse, limited nuclear war, or conquest by a totalitarian government. As terrible as these catastrophes would be for us, they can be repaired within a few generations. The one process ongoing in the 1980s that will take millions of years to correct is the loss of genetic and species diversity by the destruction of natural habitats. This is the folly our descendants are least likely to forgive us (Wilson, 1980).



Consequencies... DESTROYING THE FUNCTION OF ECOSYSTEMS AND THREATEN HUMAN LIFE



Environmental degradation

Desertification

Drought

Lack of food and energy resources

Famine

Infectious diseases

6/11/2017
GSS Seminar Kyoto University – Japan, 2014
E Sukara, 2014



The United Nations Conference on Environment and Development (UNCED), also known as the Rio de Janeiro Earth Summit, Rio Summit, Rio Conference, and Earth Summit, was a major [United Nations conference](#) held in [Rio de Janeiro](#) from 3 to 14 June 1992.

- The Earth Summit resulted in the following documents:
 - [Rio Declaration on Environment and Development](#)^[3]
 - [Agenda 21](#)
 - [Forest Principles](#)
- Moreover, important legally binding agreements ([Rio Convention](#)) were opened for signature:
 - [Convention on Biological Diversity](#)^[6]
 - [Framework Convention on Climate Change \(UNFCCC\)](#)
 - [United Nations Convention to Combat Desertification](#)

After 20 year of the convention

MASS EXTINCTION UNDERWAY

Human beings currently causing the greatest mass extinction of species since the extinction of the dinosaurs 65 million years ago.

If present trends continue one half of all species of life on earth will be extinct in less than 100 years, as a result of habitat destruction, pollution, invasive species, and climate change.



Quarter of mammals 'face extinction'





Lions 'close to extinction'

COP 10 in Nagoya 2010 concluded that species loss is continued

Study: Only 10 percent of big ocean fish remain

Scientists agree world faces mass extinction





(CNN) – The complex web of life on Earth, what scientists call "biodiversity," is in serious trouble.

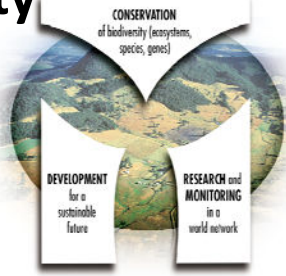
Rationalities in Decision Making Process

- ❑ In common decision-making arenas, technological, political and ethical rationalities impinge upon one another, not in the mode of horizontal mutuality, but at cross-purposes and in a vertical pattern,
- ❑ Each brand of thinking tends to approach the others in reductionist fashion. Each seeks to get the other “partners” to accept its own favored ground rules, such conflict is guaranteed to produce bad decisions,
- ❑ Good decisions need to display many qualities, and authentic dialogue where exchanges are circular and reciprocal, not vertical and reductionist; **BR Concept** may accommodate this situation

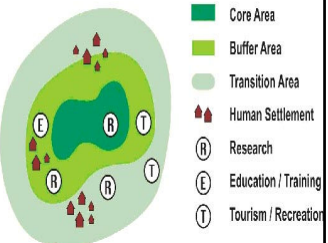
Biosphere Reserve – Challenge and Opportunity

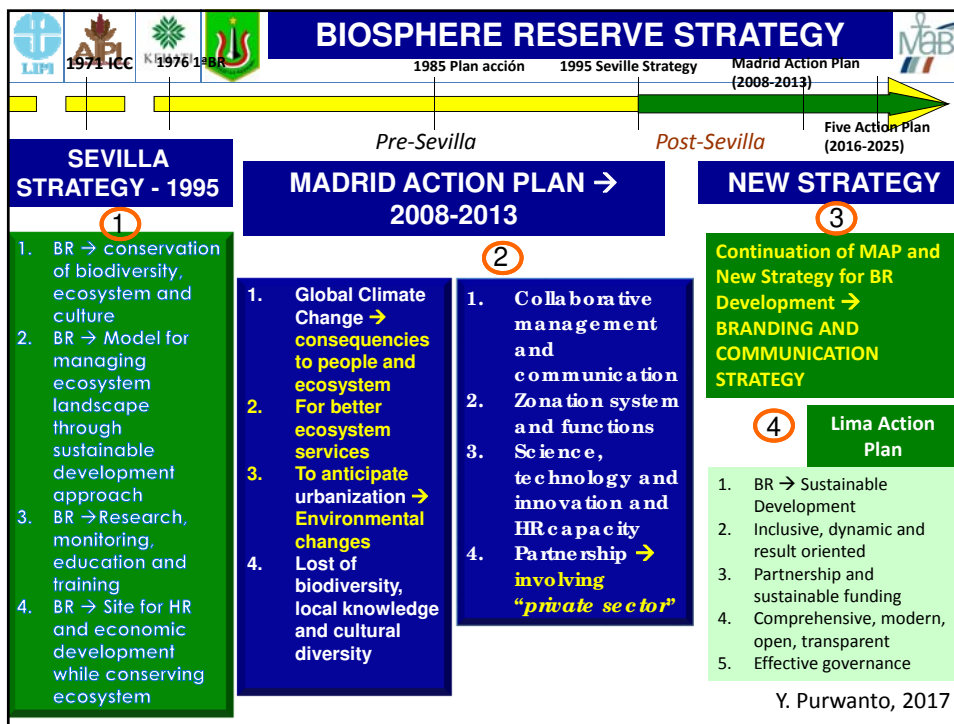
1. BR is a concept to harmonize the conservation and sustainable development,
2. BR has a Multi Stake Holders Management Board to plan and to execute programs activities to protect biodiversity and the function of ecosystem while building sustainable economic benefiting all stake holders,
3. BR program activities is based on democracy, SETI, Cultural and Ethics supported by government policy and proper investment to support implementation and achieving SDGs targets.



Structure of a model biosphere reserve.



- Core Area
- Buffer Area
- Transition Area
- Human Settlement
- Research
- Education / Training
- Tourism / Recreation



BIOSPHERE RESERVE IN INDONESIA

11 Biosphere Reserves OF INDONESIA

1
CIBODAS

2
KOMODO

3
TANJUNG PUTTING

4
LORELINDU

5
PULAU SIBERUT

6
GUNUNG LEUSER

7
GIAMSI AKKECIL BB

8
WAKATOBİ

9
BROMO TENGGER SEMERU ARJUNO

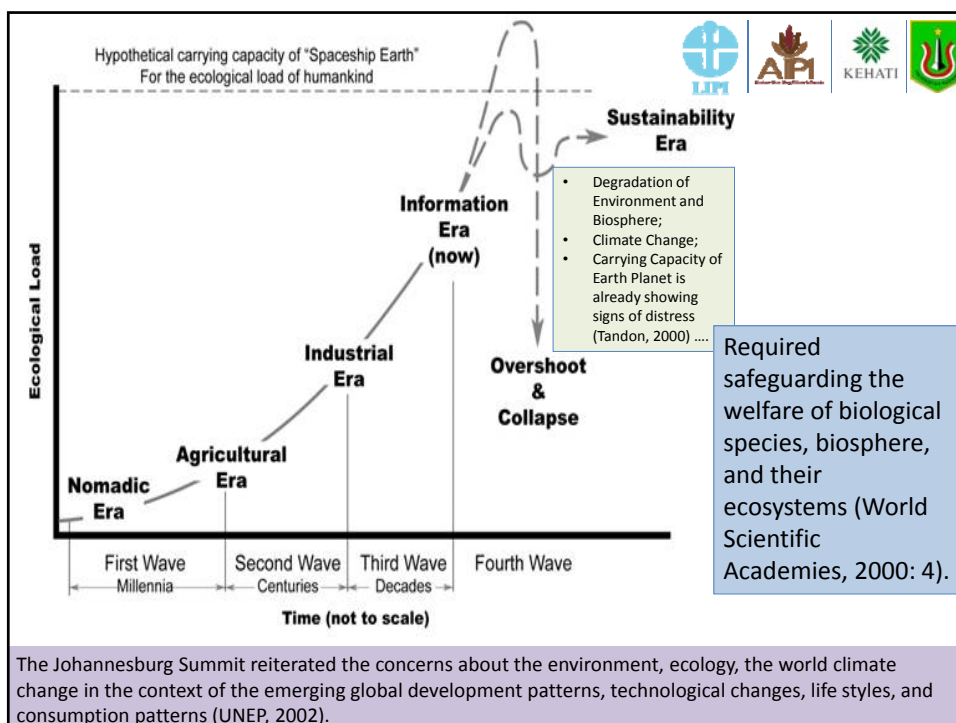
10
TAKA BONERATE KEPULAUAN SELAYAR

11

3.170.502,24 Ha
Conservation Area as the Core Zone

660 BIOSPHERE RESERVE IN 120 COUNTRIES

Y. Purwanto, 2017



Summary

- MAB Programme activities should be connected and linked strongly to the SDGs issues at global level, region, as well as member states,
- Science, Engineering, Technology and Innovation (SETI) founded by strong ethical and cultural influence supported by proper political and investment policy is mandatory and MAB Programme activities may able to help member states to accelerate the achievement of SDG.

6/11/2017

23

