

Empowering local community leadership, youth involvement, and increasing resiliency to fight

## Triple Planetary Crises: Trang and Krabi Model



**Boripat Siriaronrat**, DVM, MS, PhD  
Faculty of Environment & Resource Studies  
[boripat.sir@mahidol.ac.th](mailto:boripat.sir@mahidol.ac.th)

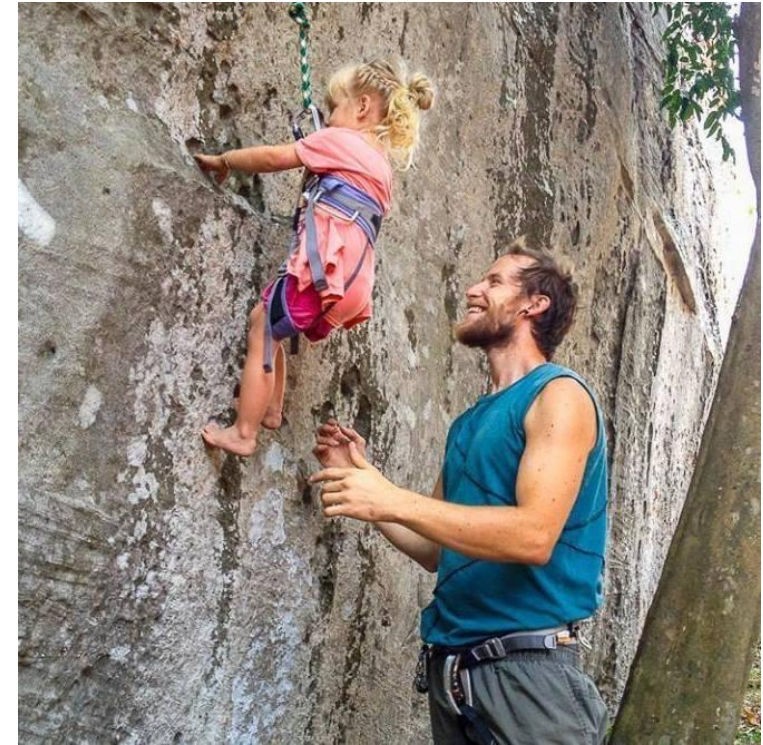


**Mahidol University**  
*Wisdom of the Land*

# Dominic Chakrabongse



# Pierre Echaubaud



PRECIOUS  
PLASTIC  
BANGKOK



Protecting People and Planet



Nature Mind-ED



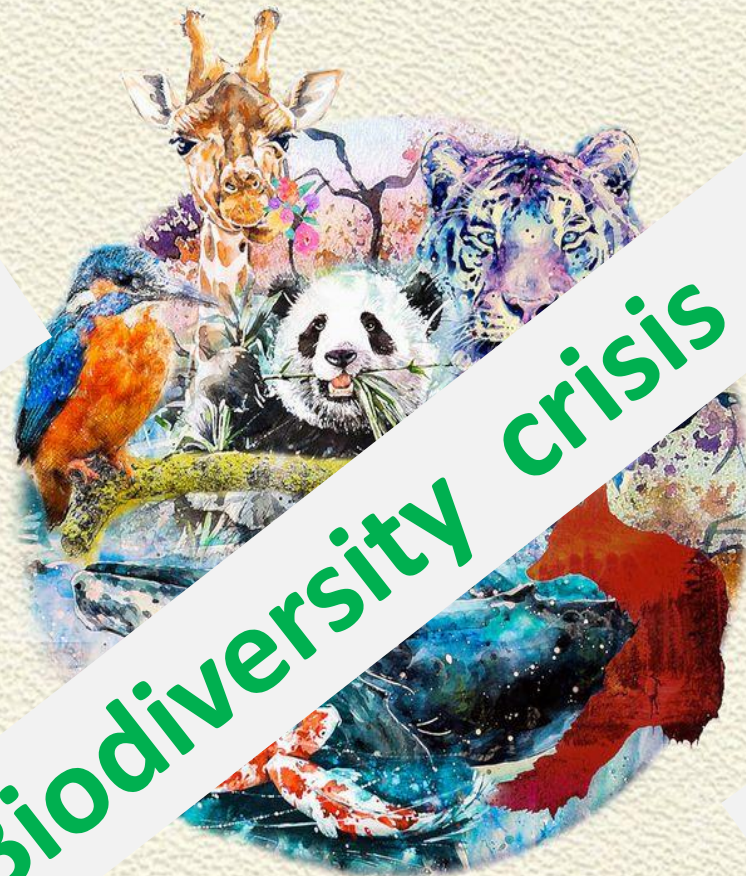
# TRIPLE PLANETARY CRISES



Forging a new relationship between people and the earth



Climate crisis



Biodiversity crisis



Waste & Pollution crisis





# The planet is seriously ill

Human needs win all

The rest of  
the planet

Human

Utilitarian

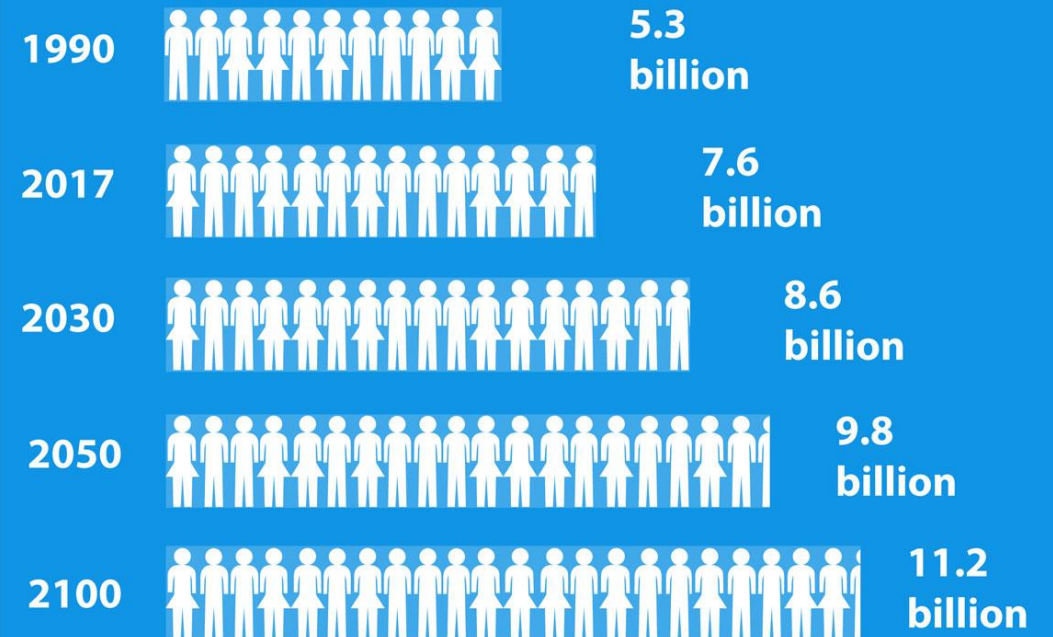
Utilitarian

Utilitarian

Esthetics,  
Moral,  
Ecological

## World Population

Projected world population until 2100



Source: United Nations Department of Economic and Social Affairs,  
Population Division, *World Population Prospects: The 2017 Revision*  
Produced by: United Nations Department of Public Information

SUSTAINABLE DEVELOPMENT GOALS



# Too many people on this planet?





## Coral Bleaching Futures

Downscaled projections of bleaching conditions for the world's coral reefs, implications of climate policy and management responses

## THERE ARE FEWER FISH IN THE SEA THAN EVER BEFORE

Percentage of high seas fished in each year | Percentage of species exploited, overexploited or collapsed



## THE PROBLEM WITH PLASTIC AND OUR OCEANS

**8 MILLION METRIC TONNES OF PLASTIC IS DUMPED INTO THE OCEAN EVERY YEAR**

THE TOP 3 ITEMS FOUND IN OUR OCEANS:

1,140,222 FOOD WRAPPERS

1,065,171 PLASTIC BOTTLES

1,019,902 PLASTIC BAGS

Many marine species including turtles, fish, whales and seabirds consume or get trapped in plastic which can result in death. They have been found with plastic bits in their stomachs, as well as plastic chemicals which have leaked into their bodies.

THE CHANCES ARE THAT IF YOU ARE EATING SEAFOOD THEN YOU ARE ALSO GOING TO BE... EATING PLASTIC

80% of all marine debris found in the ocean is land based, and 80-90% of marine debris is made from plastic!

BY THE YEAR

2050

THERE WILL BE MORE PLASTIC THAN FISH IN OUR OCEANS

plastic expert

Plastics are the most common form of marine debris. They can come from a variety of land- and ocean-based SOURCES. ENTER THE WATER in many ways, and IMPACT the ocean and Great Lakes. Once in the water, plastic debris never fully biodegrades.

### COMMONLY FOUND PLASTICS



### HOW TO HELP?



## PLASTICS IN THE OCEAN

### MICROPLASTICS

Microplastics are small plastics less than 5mm. They can come from large plastics breaking down, or can be produced as small plastics such as microbeads, which can be found in products such as toothpaste and face wash.

### BOATS/NETS

Fishing gear can become marine debris when it is lost or abandoned.

### INGESTION

Animals can easily mistake plastic debris for food.

### ENTANGLEMENT

Marine life can get caught and killed in derelict fishing nets and other plastic debris.



<https://marinedebris.noaa.gov/>

### RAIN & WINDS

Rain and wind can carry debris into nearby waterbodies.

### LITTERING

Intentional littering or improper disposal of trash can cause marine debris.

### STREAMS & STORM DRAINS

Streams and storm drains can carry debris directly into the ocean or Great Lakes.



**Climate change** is a global, and arguably one of the most difficult challenges that humanity is currently facing. Scientists agree that humans are the main cause of climate change, and that urgent action is needed to prevent serious impacts (Masson-Delmotte et al., 2018)



UNITED NATIONS  
**PARIS CLIMATE  
AGREEMENT**  
SIGNING CEREMONY  
— 22 APRIL 2016 —



WE MUST  
**STOP**  
GLOBAL  
WARMING





# Climate change presents significant challenges to human health & biodiversity

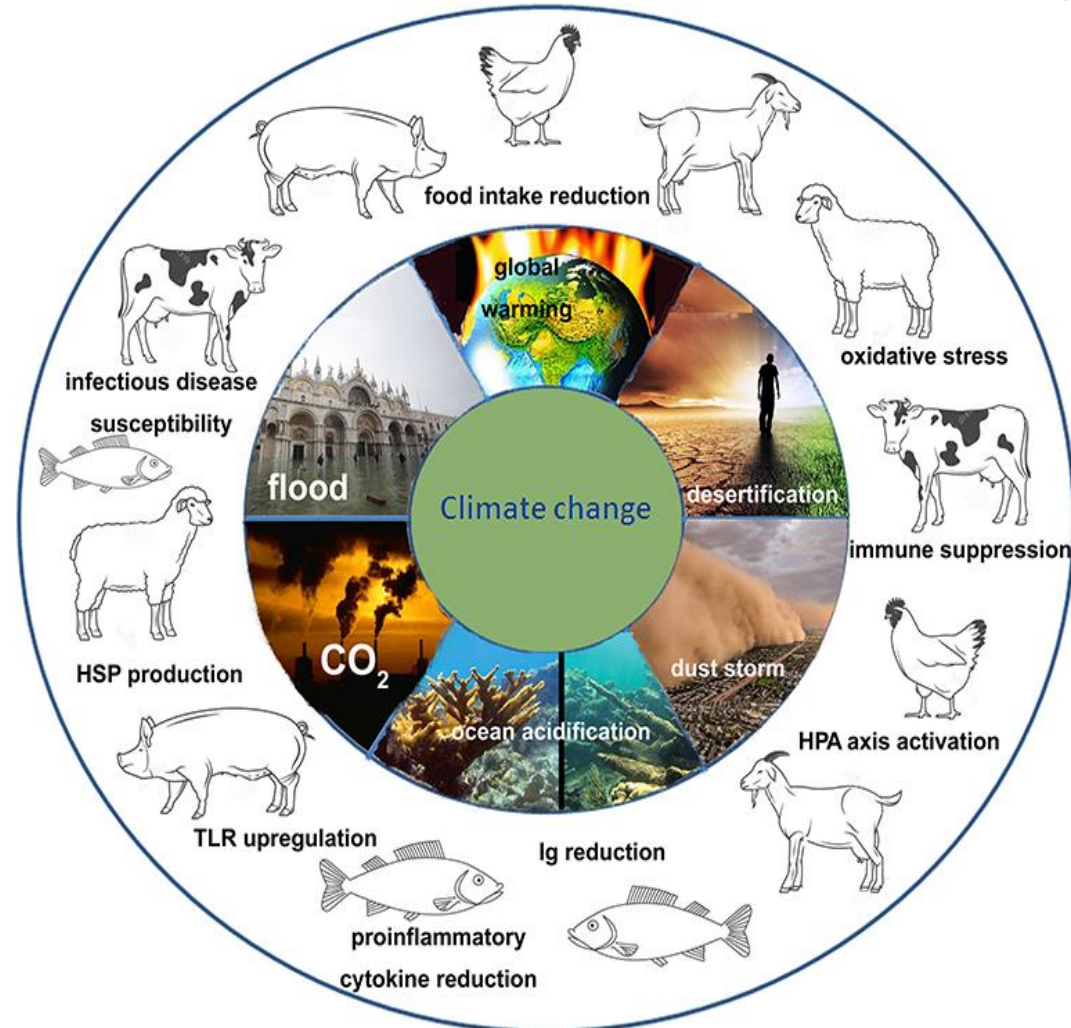
Melissa R. Marselle  
Jutta Stadler  
Horst Korn  
Katherine N. Irvine  
Aletta Bonn *Editors*

## Biodiversity and Health in the Face of Climate Change

- Increased extreme climate events (heat waves, droughts or flooding), threaten human health and well-being, both directly and indirectly, through impaired ecosystem functioning and reduced ecosystem services.
- **Nature-based solutions**, such as the provision and management of biodiversity, can facilitate human health and well-being, and mitigate the negative effects of climate change.
- The growing recognition of the importance of **biodiversity's contribution to human health** offers great potential for maximizing synergies between public health, climate change adaptation and nature conservation. (Marselle et. al, 2019)



# From wildfires to sea-level rise, **climate change** creates evolving challenges for ecosystems across the globe





# Australia wildfires: killed >1 billion animals & burnt 1.2 billion trees

## HOW DOES CLIMATE CHANGE AFFECT BUSHFIRES?

### A LONGER FIRE SEASON

Hotter conditions mean a longer fire season, leading to more dangerous bushfires and leaving less time for hazard reduction.

### DRIER VEGETATION & 'FUEL'

Hotter conditions and periods of low rainfall dry out soil and vegetation, increasing fire risk.

### HOTTER TEMPERATURES

Australia is getting hotter, with more extreme hot days and longer, hotter heatwaves. These conditions are increasing the risk of bushfires in many areas.

### MORE LIGHTNING

A warmer climate increases the chance of lightning, which is a key factor in starting fires.



## Wildlife loss in Australia much bigger than it appears

Australia's bushfires have killed an estimated 1.25 billion animals and burnt more than a billion trees so far, but even worse, they will cause permanent damage to the country's environment and wildlife presence.



WWF

## THE SHOCKING SCALE OF AUSTRALIA'S BUSHFIRES

670,000+ hectares burned



California 2018

906,000 hectares burned



Amazon 2019

2.6 million hectares burned



Siberian Fires  
JULY 2019

10 million+ hectares burned



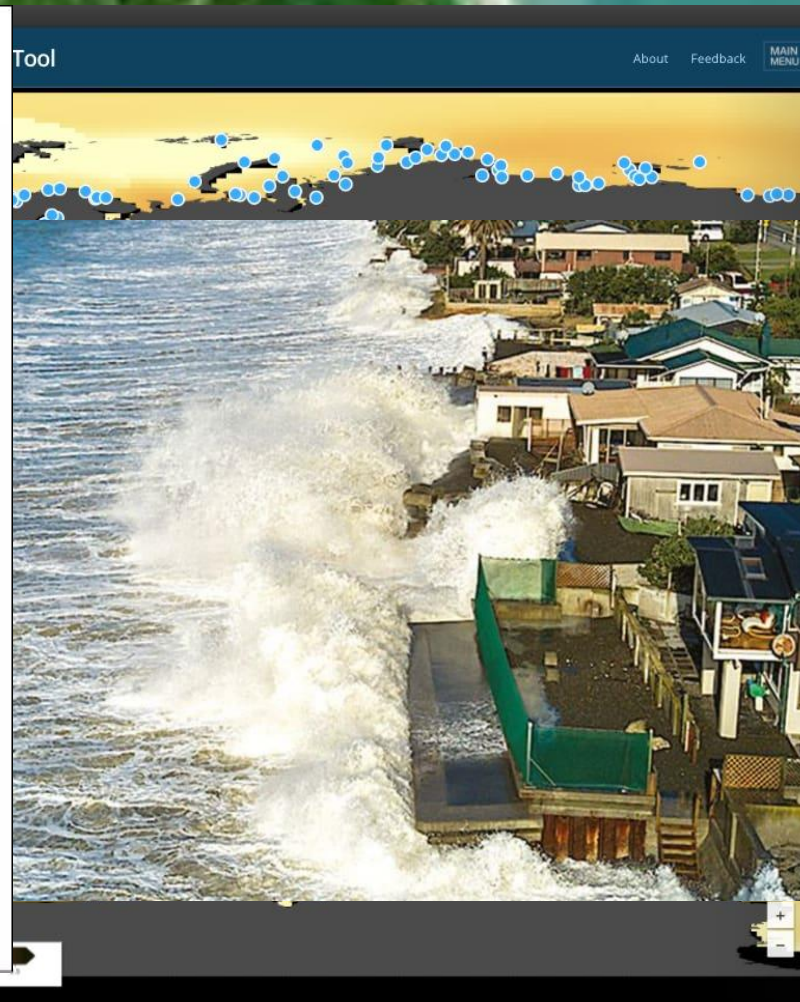
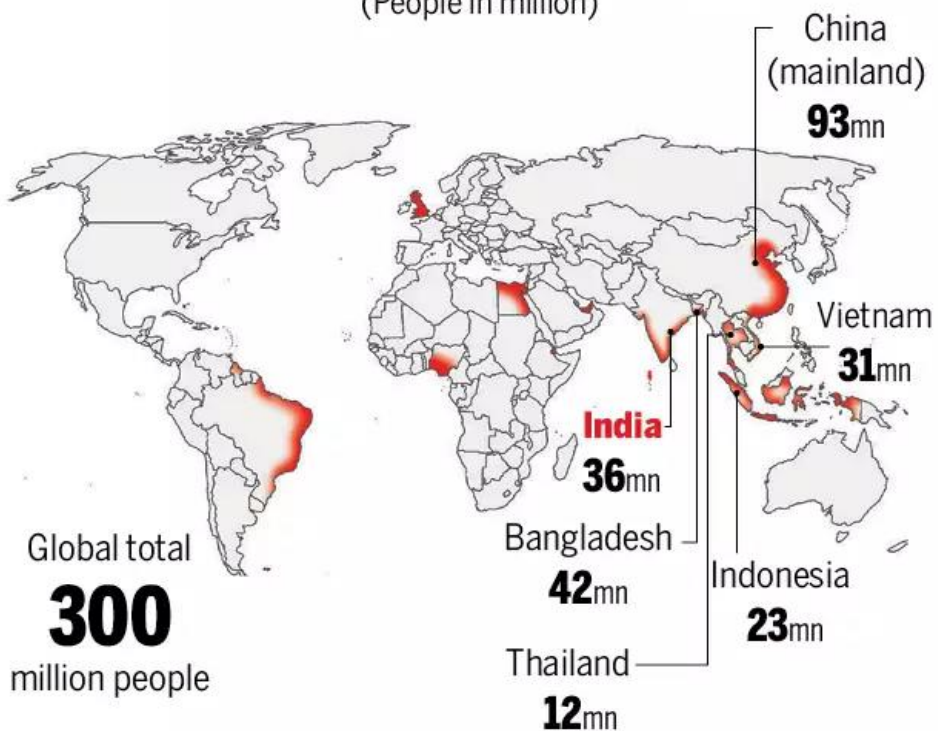
Australia  
2020



# Sea level rise impact has been discussed long ago

## Top Six Countries Affected by Sea Level rise

(People in million)



## Deadly Waters

How Rising Seas Threaten 233 Endangered Species



December 2013





A potential scenario of future sea level rise in South Beach,  
Miami, Florida, with a global temperature rise of 2C°

Photograph: Nickolay Lamm/Courtesy Climate Central

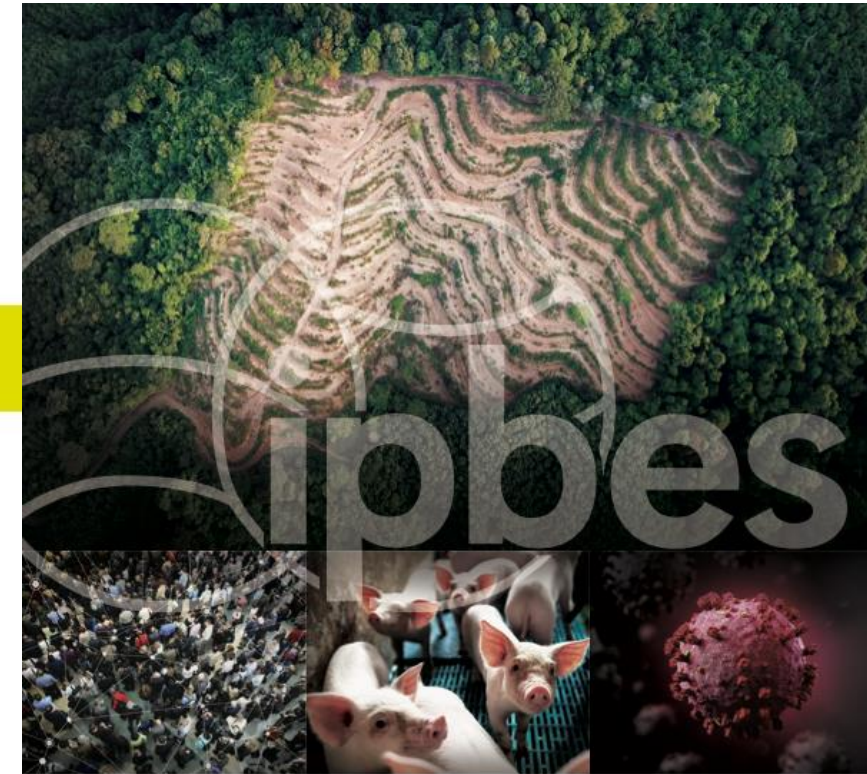
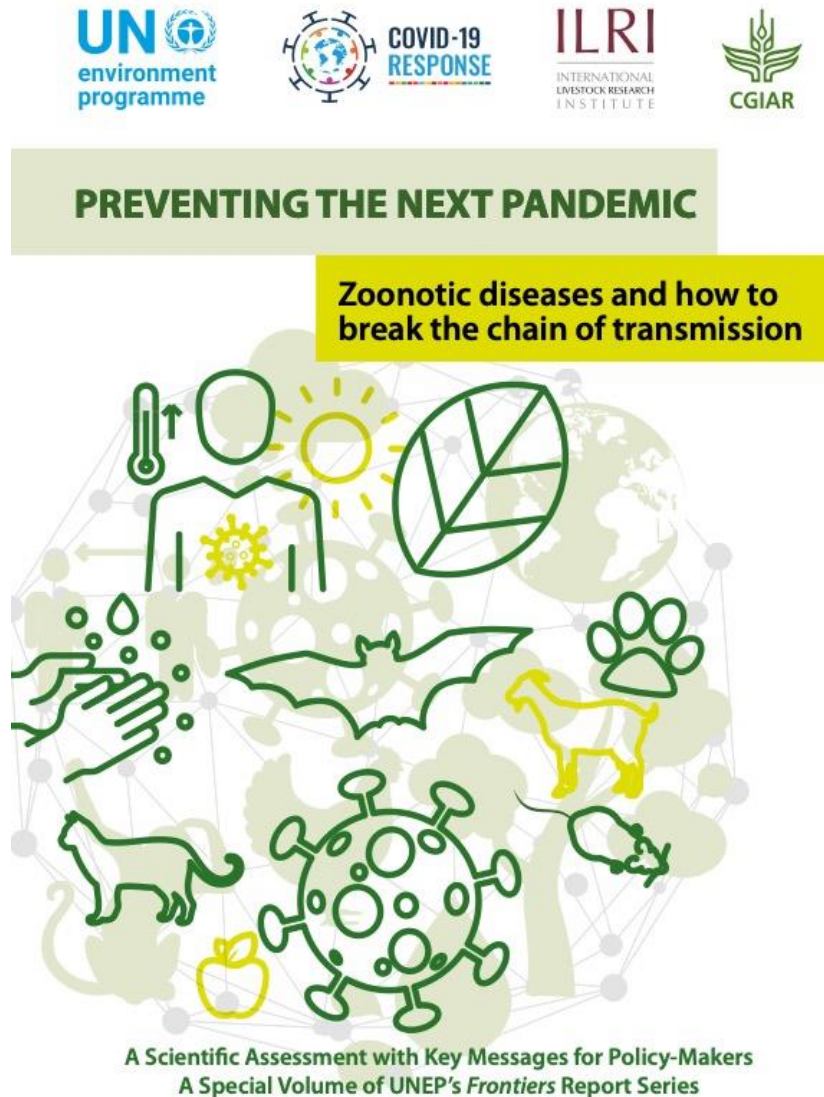
**The  
Guardian**



# Climate change-biodiversity-pandemics



IPBES-IPCC CO-SPONSORED WORKSHOP  
**BIODIVERSITY AND  
CLIMATE CHANGE**  
WORKSHOP REPORT



**IPBES WORKSHOP  
ON BIODIVERSITY  
AND PANDEMICS**  
WORKSHOP REPORT

Intergovernmental Science-Policy Platform  
on Biodiversity and Ecosystem Services



# Waste-pollution & health



Solid waste disposal sites

Wildlife – domestic animal/human INTERFACE

pathogen

**SPILL OVER**

by our hands



Infectious Waste:  
Challenges in COVID-19 Pandemic



Courtesy of Paisin Lekcharoen



# What can we do to save this planet?





# One Planet-One Health: *how to deal with wicked problems?*



50833

## People, Pathogens and Our Planet

Volume 1: Towards a One Health Approach for Controlling Zoonotic Diseases



REPORT NO. 50833-GLB

Satoyama Initiative Thematic Review

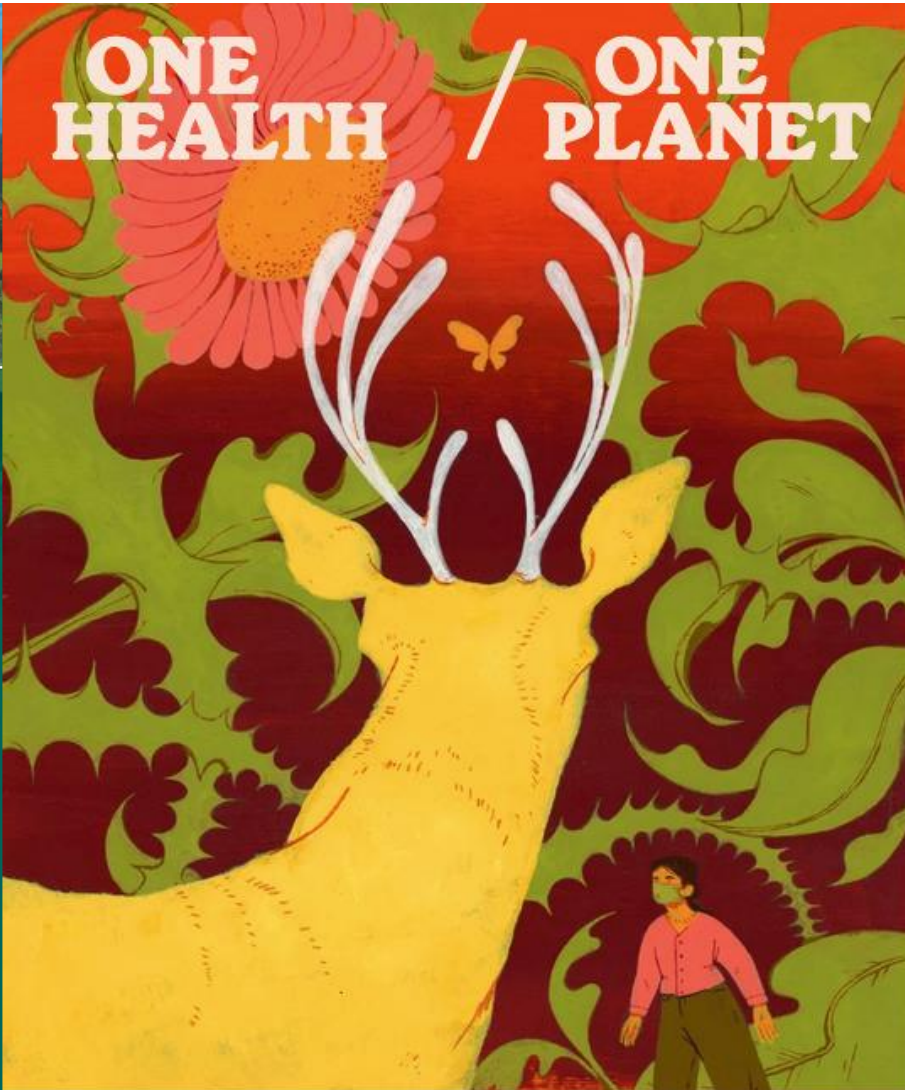
Maiko Nishi  
Suneetha M. Subramanian  
Himangana Gupta *Editors*

## Biodiversity- Health-Sustainability Nexus in Socio- Ecological Production Landscapes and Seascapes (SEPLS)



OPEN ACCESS

Springer



Sponsored by  
SCIENCE  
PHILANTHROPY ALLIANCE

Co-Published by

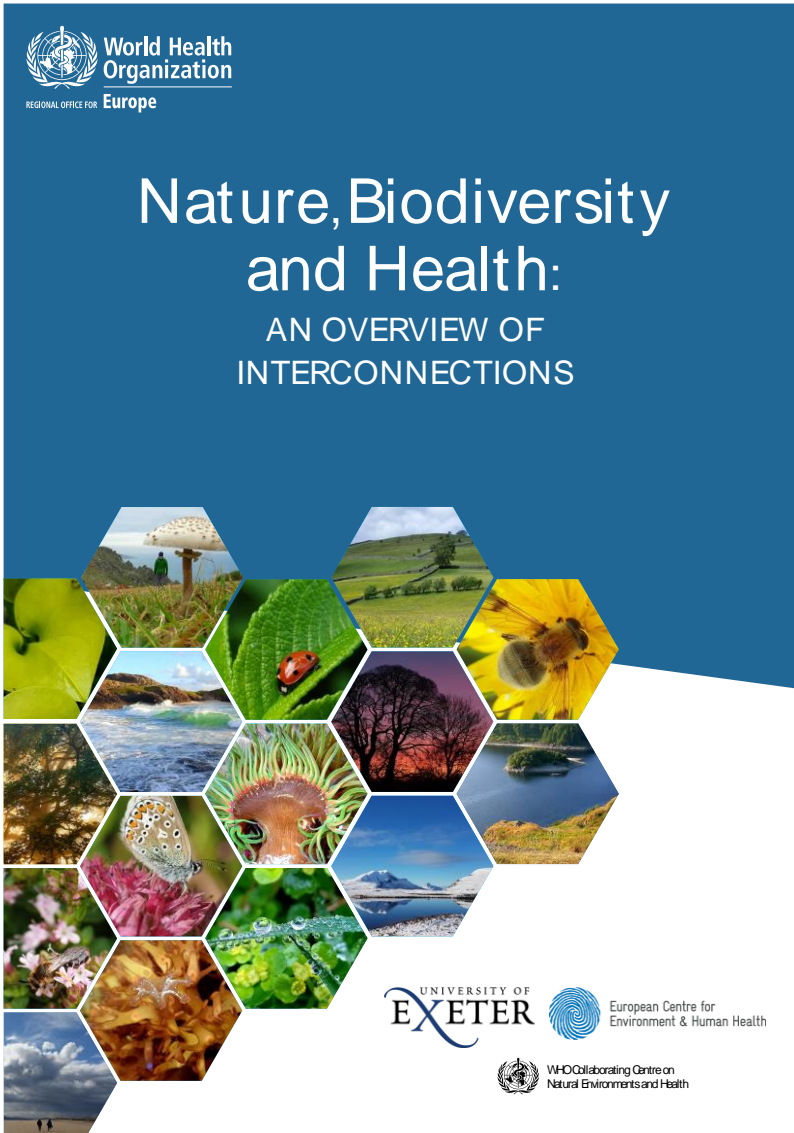
leaps.  
org

esper institute

SCIENCE  
& SOCIETY  
THE OPEN INSTITUTE



# A summary of links between nature, biodiversity and health





# One Health

Healthy ecosystems

Healthy humans

Healthy animals



Food and Agriculture  
Organization of the  
United Nations

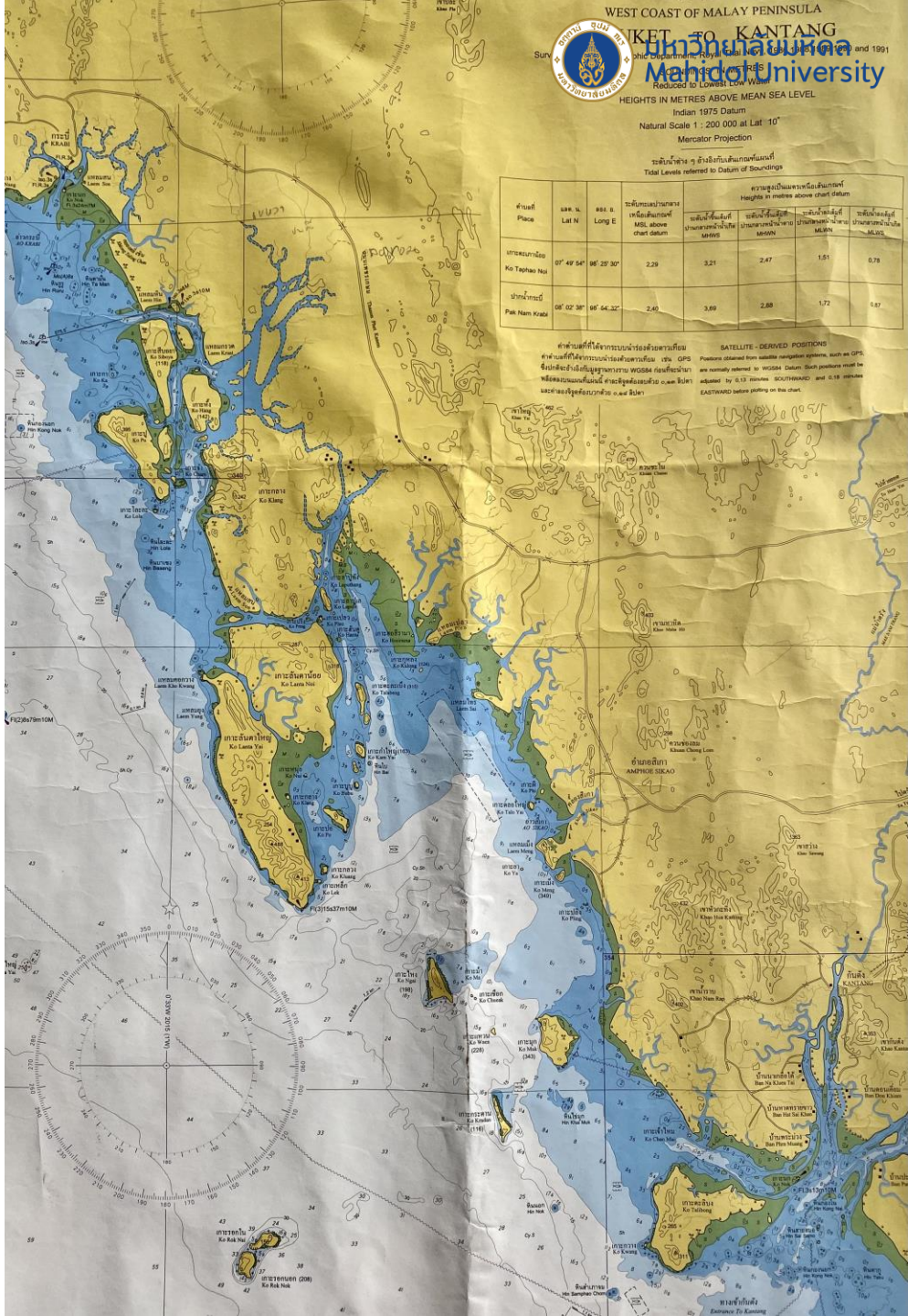


World Health  
Organization





# Trang-Krabi and the Andaman





# The people





# The livelihood





# How we empower them to be more resilient?





# The local first

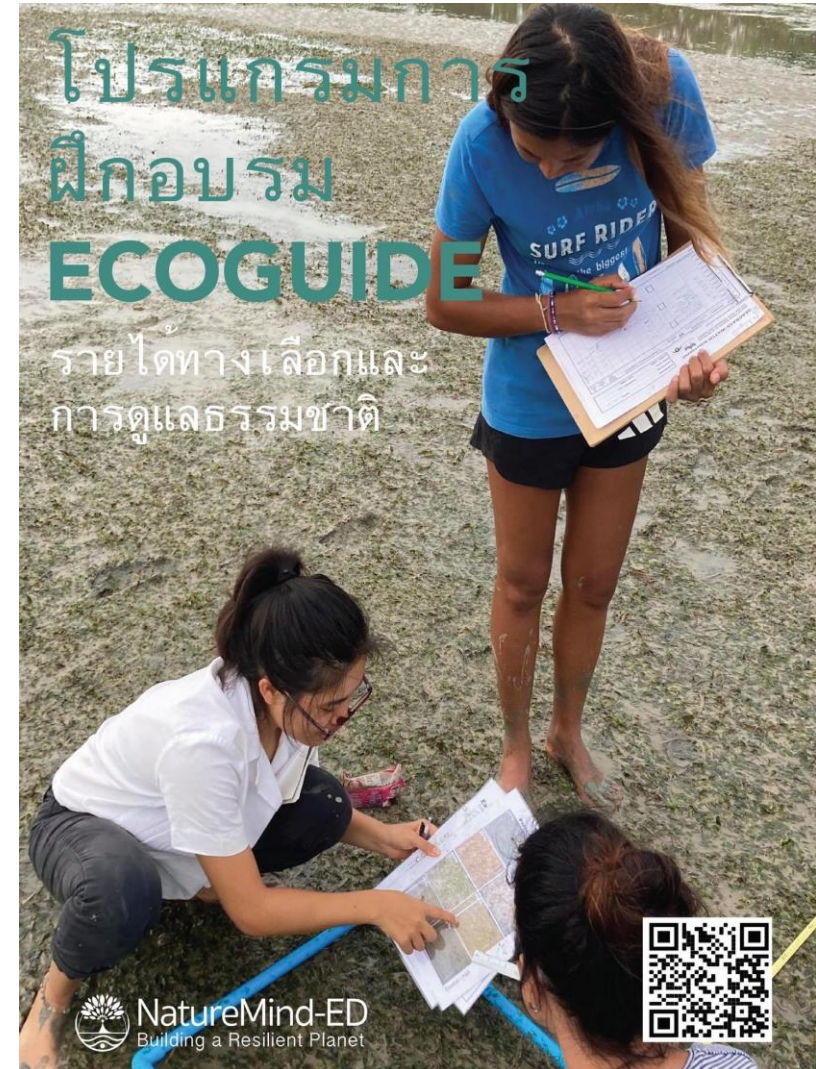


มหาวิทยาลัยมหิดล  
Mahidol University





# Empowering Youth





# Environmental education for local youth





# Mobile journalist/Citizen scientist





# Taking real actions to educate and inspire change

**Volunteer gardeners  
wanted!**

Every Thursday - 8.30-10.30am

Join us and get some  
Garden vitamin to start  
your day!

(No experience needed,  
mood uplift guaranteed)

 Spirit Mountain





# Ecosystems restoration/intersectoral collaboration



**COMMUNITY-BASED BIODIVERSITY  
CONSERVATION VOLUNTEERING  
PROGRAM IN KRABI**  
*Experience Nature and Culture as you never have*



## PERMACULTURE & SUSTAINABILITY

Starting from the realization that growing food locally is one of the most powerful commitment to sustainability and resilience we started our community garden as a way to provide learning opportunities for members of the local community towards food sovereignty and independence. Embracing permaculture and the principles of parsimony, interconnectedness, and reconnecting to nature rhythms and patterns.

## SEAGRASS & MANGROVE CONSERVATION

You will participate in our SEAGONG IUCN-funded project and the MAN-CoRe project. We will monitor seagrass and mangrove coverage using transects and quadrat, assist with drone mapping, explore seagrass and mangrove-related biodiversity and report data into the database as well as visit fishing communities participating in the project.



## NET FREE SEAS PROJECT

The Net Free Seas project (NFS) is a project started by the Environmental Justice Foundation (EJF) in 2019. NatureMind-ED joined the project as Krabi province coordinator in 2021. Volunteers will participate in the project and working with local fishing communities and NatureMind-ED staff to co-design more sustainable fishing practices, collect discarded nets, clean the nets and coordinate net collection by recyclers.



## CORAL CONSERVATION

Sedimentation, climate change and boat traffic are together responsible of the deterioration of coral reef ecosystems in the Andaman region. Efforts to restore coral cover and the biodiversity associated to it are ongoing. Volunteers will participate in coral propagation in a conservation area off aonang coast and learn about coral ecology and the complex set of interacting factors threatening reefs and marine ecosystems at large.



**WHEN** | Anytime - contact us for planning  
**WHERE** | @Spirit Mountain - Ao nang area, Krabi  
**COSTS** | Accommodation/food/activities - contact us

+66958964673   
NatureMind-ED   
info@naturemind-ed.com 



Longspurs are found in shallow wetlands and freshwater systems in many parts of the world, from the tropics to the Arctic Circle. Longspurs are so named because their spurs have long, gentle, gentle curves. They are often confused with spoonbills, but are actually more closely related to the flamingo phylum. They are also called Longspurs because their bills are long and curved, and produce a long, steady sound.

[illegible]

\_\_\_\_\_

There are approximately 72 different species of anemones around the world, belonging to four subgenera. In only two species (eleven as compared to four plants in the Caribbean) are we considered as 12 different species, although in our communities they are easily found in 4 to 6 species. The most common species found here are the ones depicted here.

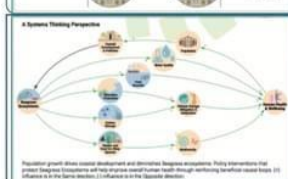
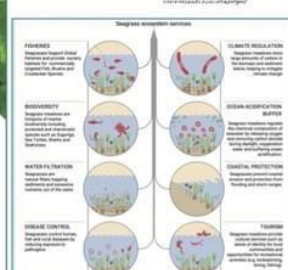
The 72 species of angiosperms are naturally divided into five major groups: *Umbellales*, *Myristicales*, *Rubiaceales*, *Hamamelidales* and *Caryophyllales*. These five classes contain the following: the *Umbellales*, *Urticaceae*, have grass, shrub grass, and *Myristicales* grass, *Myristicales* many shrubs and some and *Urticaceae* angiosperms. *Rubiaceales* single herb species with long life spans that last the others is two or perhaps three long, *Hamamelidales* are angiosperm shrubs or sometimes trees. The latter angiosperm *Caryophyllales* *Hamamelidales* are shrub growing to 15 cm 72 species is large. *Rubiaceales* angiosperm species are grass growing shrubs or grass, each very clearly. The latter *Hamamelidales* and *Caryophyllales* are often not angiosperm species but are angiosperm and angiosperm species, and the *Hamamelidales*

and the following are the results of the analysis of variance for the effect of the different factors on the response variables. The results are presented in Table 2. The analysis of variance for the effect of the different factors on the response variables is presented in Table 2. The results are presented in Table 2.

[illegible]

\_\_\_\_\_

<p><b>Engorgement causes:</b> Engorgement provides a variety of self-correcting mechanisms, such as:</p> <ul style="list-style-type: none"> <li>• <b>Cosine and Engorgement stress control:</b> When there is excessive breast stimulation, there is less stimulation going through to the alveolar ducts.</li> <li>• <b>Feed by frequency, quantity, and consistency:</b> <ul style="list-style-type: none"> <li>• <b>Added by control:</b> feed, only, until the baby is full.</li> <li>• <b>Reduce stress:</b> it helps to calm the baby. One source of stress is the amount of time spent in the breast.</li> <li>• <b>Reduce stress:</b> it helps to calm the baby.</li> <li>• <b>Reduce stress:</b> it helps to calm the baby.</li> <li>• <b>Reduce stress:</b> it helps to calm the baby.</li> </ul> </li> <li>• <b>Feeding stress:</b> it helps to calm the baby.</li> <li>• <b>Feeding stress:</b> it helps to calm the baby.</li> <li>• <b>Feeding stress:</b> it helps to calm the baby.</li> </ul>	<p><b>Engorgement causes:</b> Engorgement provides a variety of self-correcting mechanisms, such as:</p> <ul style="list-style-type: none"> <li>• <b>Cosine and Engorgement stress control:</b> When there is excessive breast stimulation, there is less stimulation going through to the alveolar ducts.</li> <li>• <b>Feed by frequency, quantity, and consistency:</b> <ul style="list-style-type: none"> <li>• <b>Added by control:</b> feed, only, until the baby is full.</li> <li>• <b>Reduce stress:</b> it helps to calm the baby. One source of stress is the amount of time spent in the breast.</li> <li>• <b>Reduce stress:</b> it helps to calm the baby.</li> <li>• <b>Reduce stress:</b> it helps to calm the baby.</li> <li>• <b>Reduce stress:</b> it helps to calm the baby.</li> </ul> </li> <li>• <b>Feeding stress:</b> it helps to calm the baby.</li> <li>• <b>Feeding stress:</b> it helps to calm the baby.</li> <li>• <b>Feeding stress:</b> it helps to calm the baby.</li> </ul>
--	--

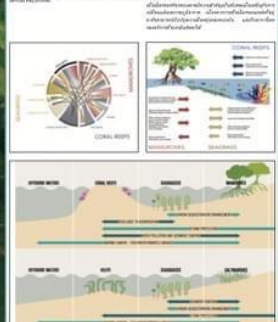


language can be used to describe it, and usually they are the

အောက်ဖော်ပြပါအတိုင်း နေရာအနှံ့တွင် တွေ့ရှိရသည့် အပင်များကို အောက်ဖော်ပြပါအတိုင်း ဖော်ပြထားပါသည်။

© 2004 Blackwell Publishing Ltd, *Journal of Internal Medicine* 255: 105–112

Highly virulent dengue isolates in both temperate and tropical regions. While dengue epidemics last in South Africa 2 to 3 years (1, 2), seasonal but the dengue epidemic season in South Africa is distinguished from those found in tropical regions (2, 3) occurring. While most countries are dominated by one or two dengue serotypes, regions in the tropical states of the Indian and South Pacific continents have the highest number of dengue serotypes, as many as 17 different genotypes (4).

[illegible][illegible]

NatureMind-ED (NM-ED) is the lead investigator and project director for this project. NM-ED is an initiative inspiring and facilitating the reconnection between nature and people, building resilience, supporting social innovation and nature-based solutions. We build networks, design transformative experiences, provide expertise and empower local actors to become the stewards of their natural resources.

 **DONATE!**

Contact us at:  
[info@naturemind-ed.com](mailto:info@naturemind-ed.com)  
 Phone: 0958956673 (Spain)

☎ 0943955596 (TH)

Thank you to all our partners

โครงการริเริ่มการอนุรักษ์และอนุรักษ์พะยูนตามชุมชน

[illegible]

### What are the differences between a dugong and a manatee?

**Dugong**

- They are the largest of the manatee family, growing up to 3m long and 1,500kg.
- They are found in the coastal waters of Australia, the Philippines, and the Indonesian archipelago.
- They are found in the coastal waters of Australia, the Philippines, and the Indonesian archipelago.
- They are found in the coastal waters of Australia, the Philippines, and the Indonesian archipelago.
- They are found in the coastal waters of Australia, the Philippines, and the Indonesian archipelago.

**Manatee**

- They are the largest of the manatee family, growing up to 3m long and 1,500kg.
- They are found in the coastal waters of Australia, the Philippines, and the Indonesian archipelago.
- They are found in the coastal waters of Australia, the Philippines, and the Indonesian archipelago.
- They are found in the coastal waters of Australia, the Philippines, and the Indonesian archipelago.
- They are found in the coastal waters of Australia, the Philippines, and the Indonesian archipelago.

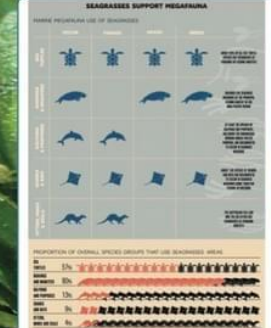
**Conservation Status Legend:**

- Extinct** (Red circle)
- Threatened** (Orange circle)
- Least Concern** (Green circle)

**Species Status:**

- Dugong: **Threatened** (Orange circle)
- Manatee: **Least Concern** (Green circle)

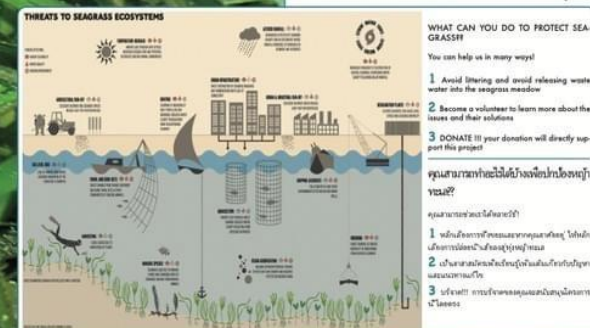
\_\_\_\_\_



Some arguments are limited by an inevitable amount of disagreement. For example, the argument that the world is a better place than it was 50 years ago is limited by the fact that the world is still a long way from being a better place than it was 50 years ago. The argument that the world is a better place than it was 50 years ago is limited by the fact that the world is still a long way from being a better place than it was 50 years ago.



---



**WHAT CAN YOU DO TO PROTECT SEA GRASS?**

You can help us in many ways!

- 1 Avoid littering and avoid releasing waste water into the seagrass meadow
- 2 Become a volunteer to learn more about the issues and their solutions
- 3 **DONATE !!!** your donation will directly support this project

คุณสามาถทำอะไรได้บ้างเพื่อปกป้องหญ้าทะเล?

ใช่ไหม?

คุณสามาถช่วยเราได้หลายวิธี

- 1 หลีกเลี่ยงการทิ้งขยะและอย่าปล่อยน้ำเสียลงสู่ที่หญ้าทะเล
- 2 เข้าร่วมเป็นอาสาสมัครเพื่อเรียนรู้เกี่ยวกับปัญหาและวิธีแก้ไข
- 3 **บริจาค !!!** การบริจาคของคุณจะสนับสนุนโครงการนี้โดยตรง

ขอบคุณ





# Seagrass project with school and community







# Eco

COMMUNITY MARKET

SATURDAY 17TH OF DECEMBER

# ECO COMMUNITY MARKET @ KRABI

SAT 17 DEC 2022 ⌚ 11 AM - 5 PM

📍 Spirit Mountain, Chong Pli soi 6 Aonang



ENTRANCE FEE 20 B.



More info  
0984179621



Spirit Mountain





# Precious Plastic Bangkok



## Key activities & outcome

Our community network



### Communities Network

#### 9 Locations

- Doi Tung, Chiangrai
- Baan Amphur, Chonburi
- Koh Klang, Bangkok
- Bang Ya Praek, Samutsakorn
- Mercy Centre, Bangkok
- Wat Chak Daeng, Samutprakan
- Phan Din Thong, Nonthaburi
- Koh Lanta, Krabi
- Rangsit, Pathum Thani



# Recycled Products

## Community products

12 small designed products

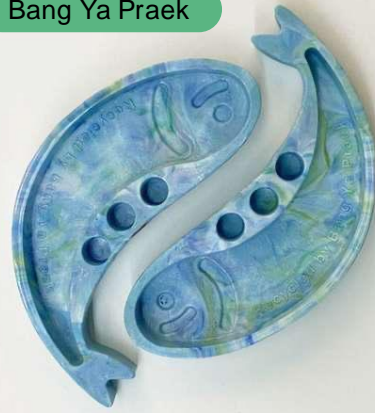
- Doi Tung > 2 Magnets
- Baan Aumphur > 3 Coasters
- Koh Klang > 4 Plant pots
- Bang Ya Praek > 1 Stationery holder
- Mercy Centre > 1 Keychain and 1 carabiner

## PPB Products

3 small designed products and 2 large designed products

- Beads
- Bag charms
- Laptop stand
- Lamp
- Bench

Bang Ya Praek



Koh Klang



Doi Tung



Baan Amphur



PPB



Mercy Centre



PPB



PPB



PPB



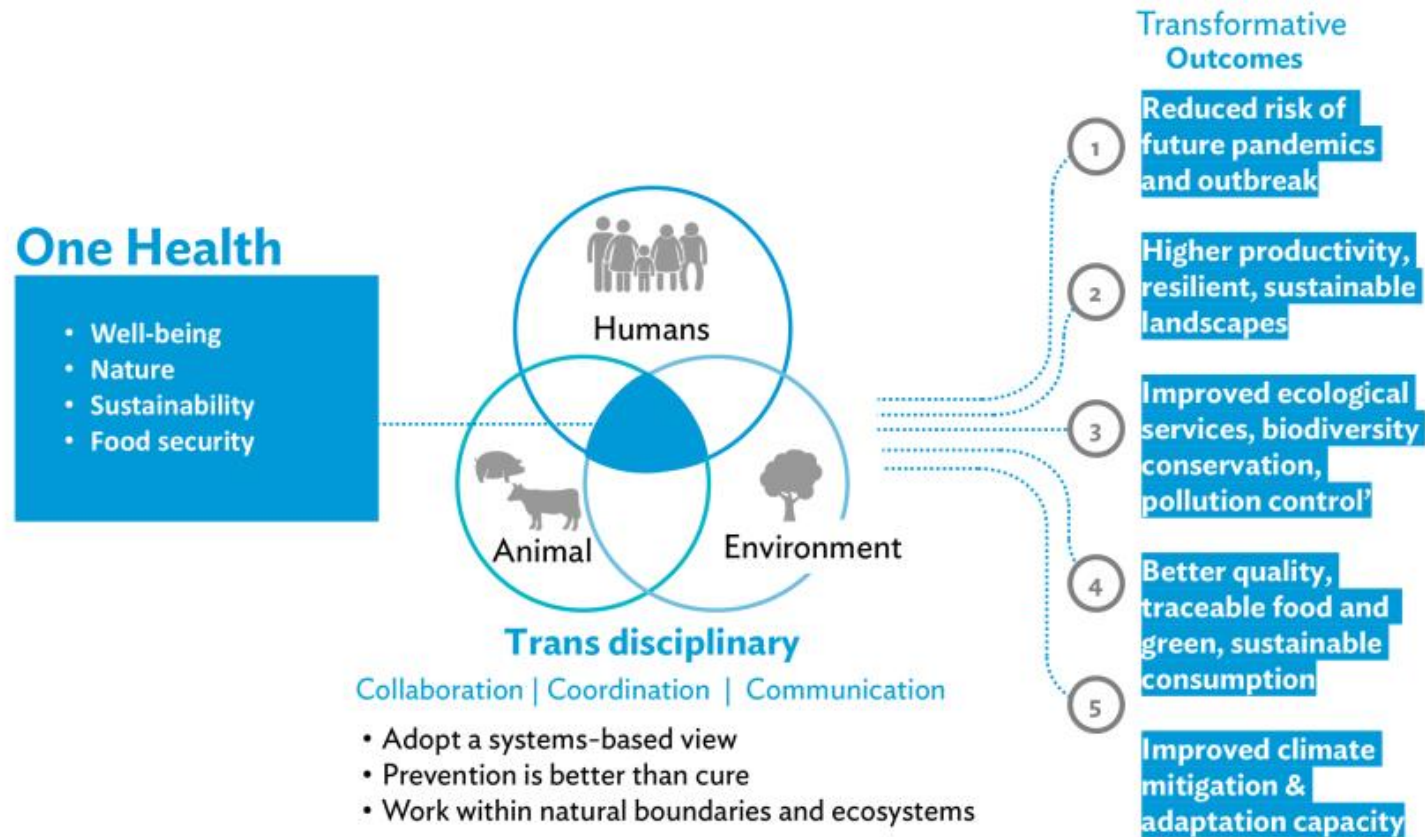


## Community Gallery





# Transformative outcomes expected from One Health





# IMPLEMENT CLIMATE ADAPTATION STRATEGIES

Hofmeister et al, 2022

## Nature-Based Solutions Can Build Resilience to Multiple Climate Hazards



Government of British Columbia, Canada

Source: Global Commission on Adaptation, *Adapt Now* report, 2019.

20.05.20



# Key actions in **climate-biodiversity** include accelerating, articulating and applying simultaneously at local, regional, national and global scales decisions to:

- Mitigate climate change
- Conserve & restore biodiversity
- Internalize into pricing the value of natural services
- Build **resilience** and reduce societal exposure to those impacts which cannot be avoided
- Identify effective protective and restorative options

Sustainability Science (2022) 17:5–7  
<https://doi.org/10.1007/s11625-021-01059-x>

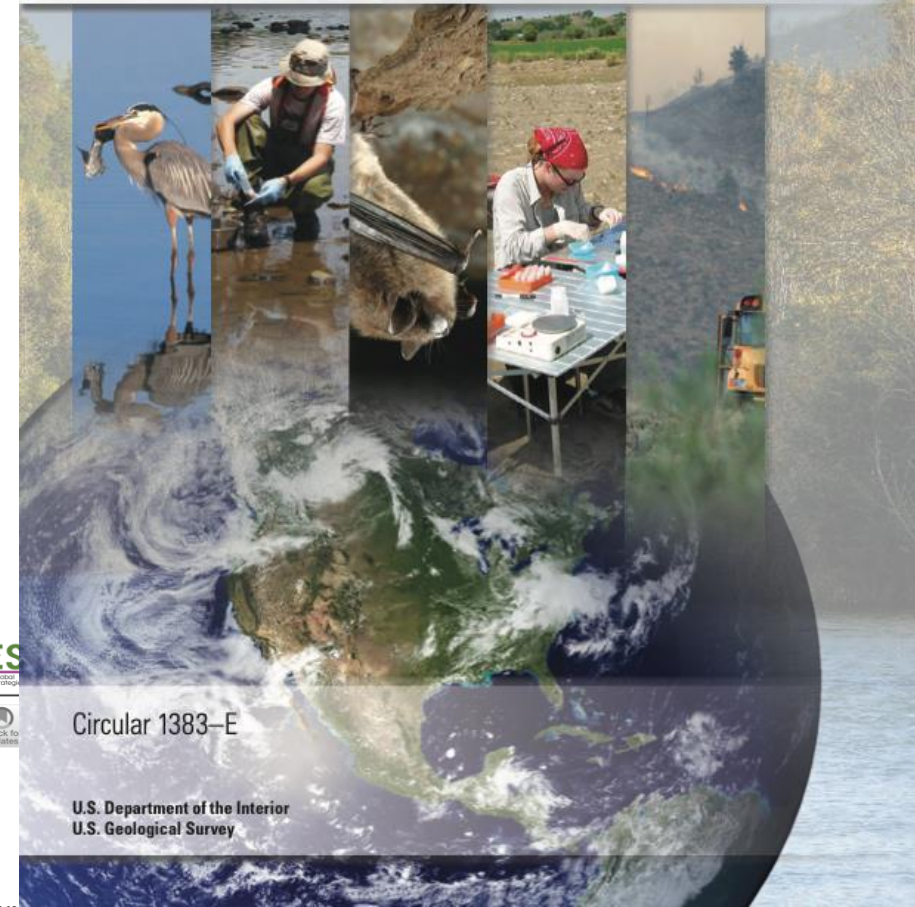
## STATEMENT

### Addressing our planetary crisis

Consensus statement from the presenters and International Advisory Committee of the Regional Action on Climate Change (RACC) Symposium held in conjunction with the Kyoto-based Science and Technology in Society (STS) Forum, 1 October 2021



## U.S. Geological Survey Environmental Health Science Strategy— Providing Environmental Health Science for a Changing World

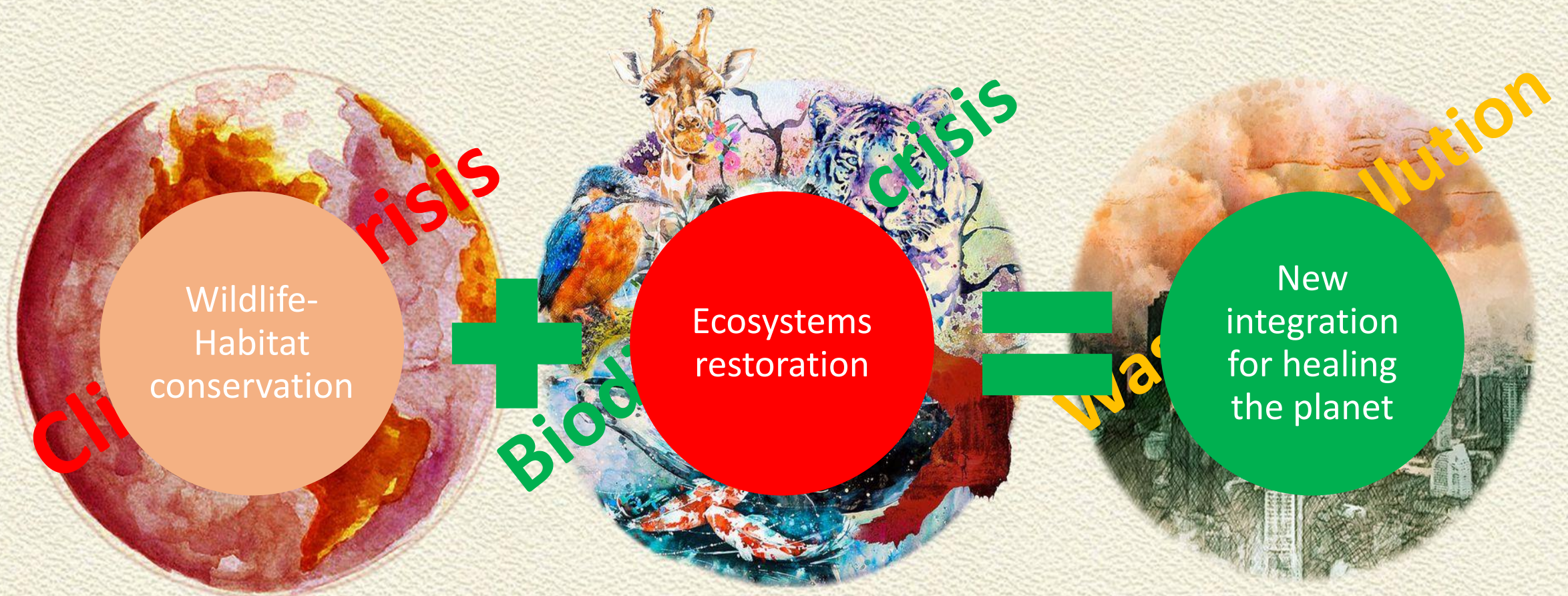


Circular 1383–E

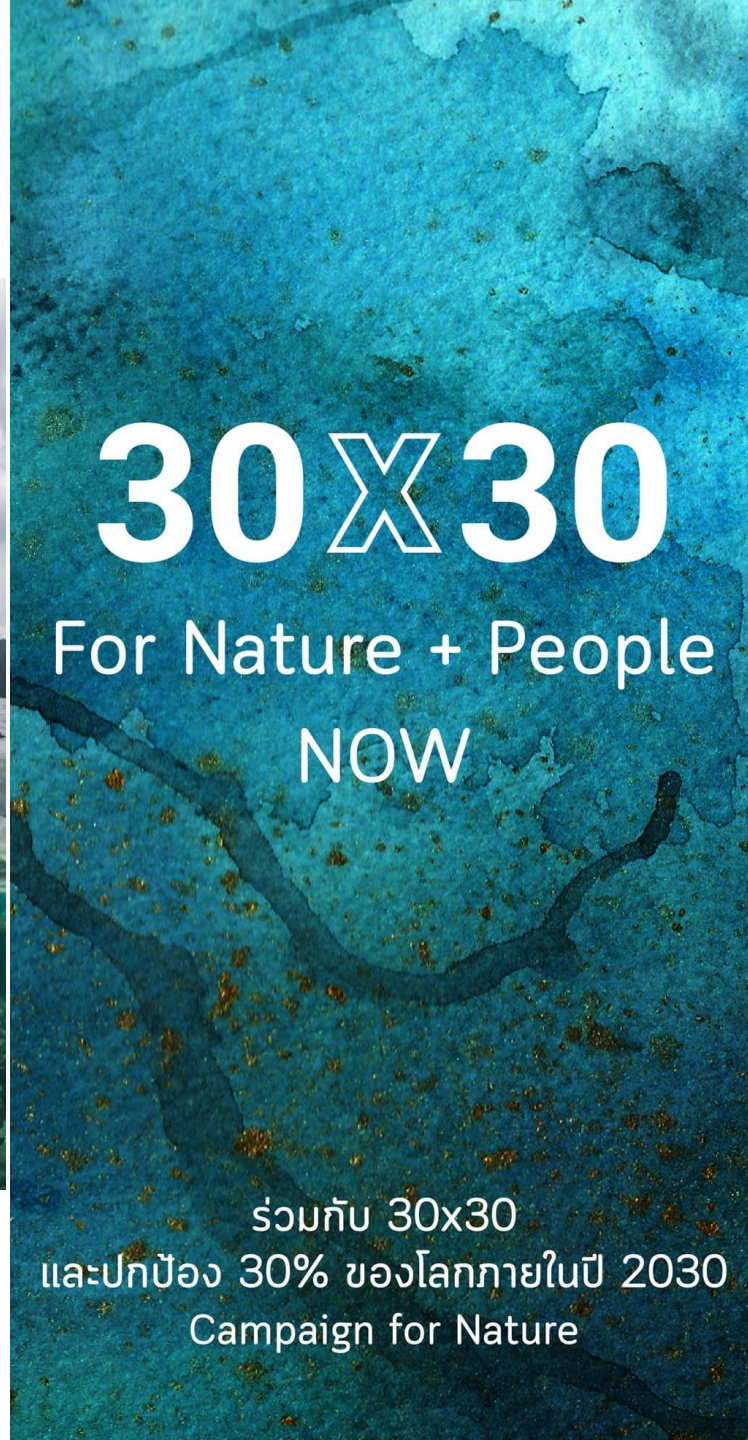
U.S. Department of the Interior  
U.S. Geological Survey



# Human-wildlife-ecosystems health is in everyone's hand









*...I wish you peace and good health*



**One planet**  
handle with care



**15<sup>th</sup>**

International Conference of  
Asian Society of  
Conservation Medicine  
25-28 October 2022

