One Health: How Human Can Thrive with Ecosystems

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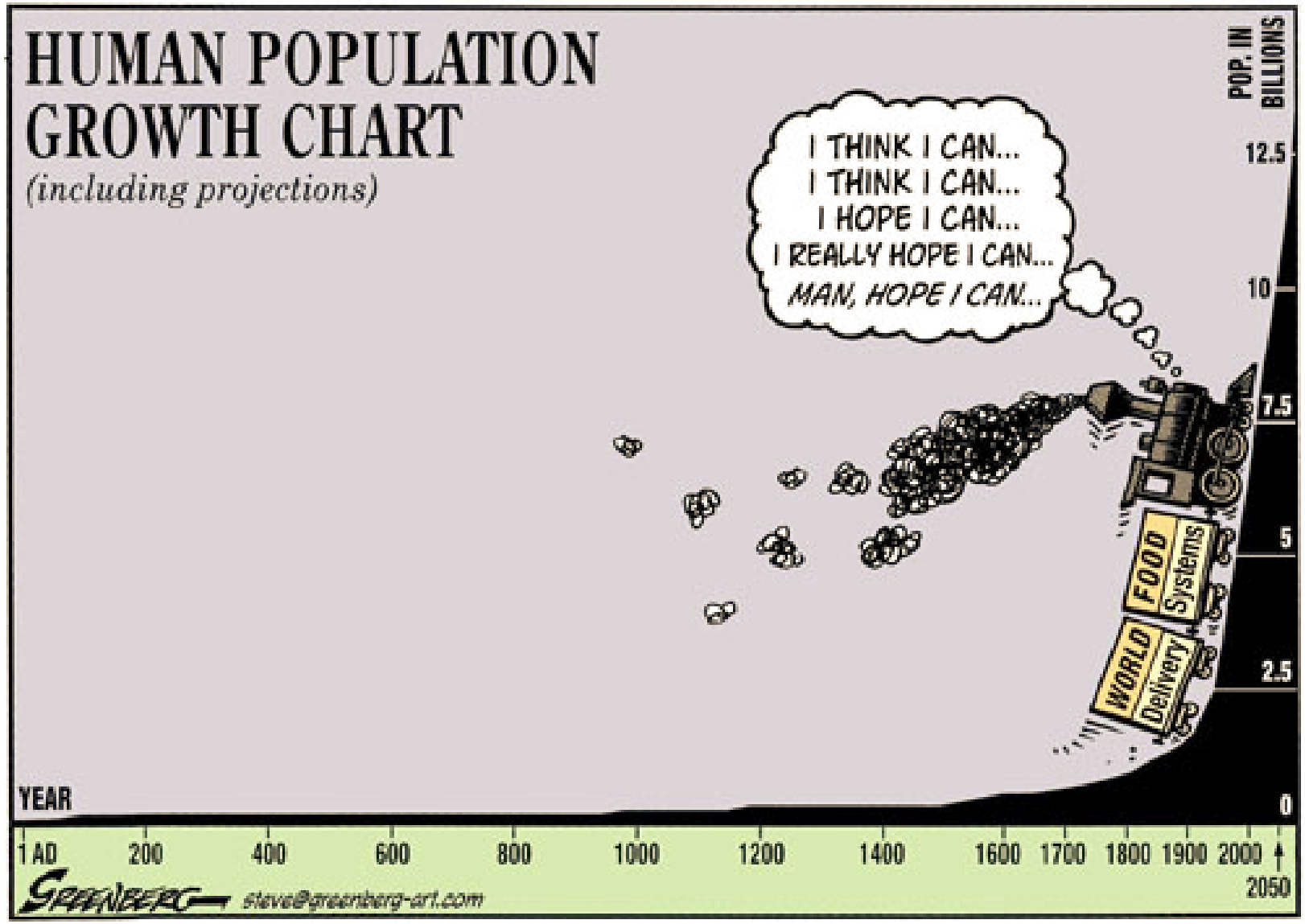
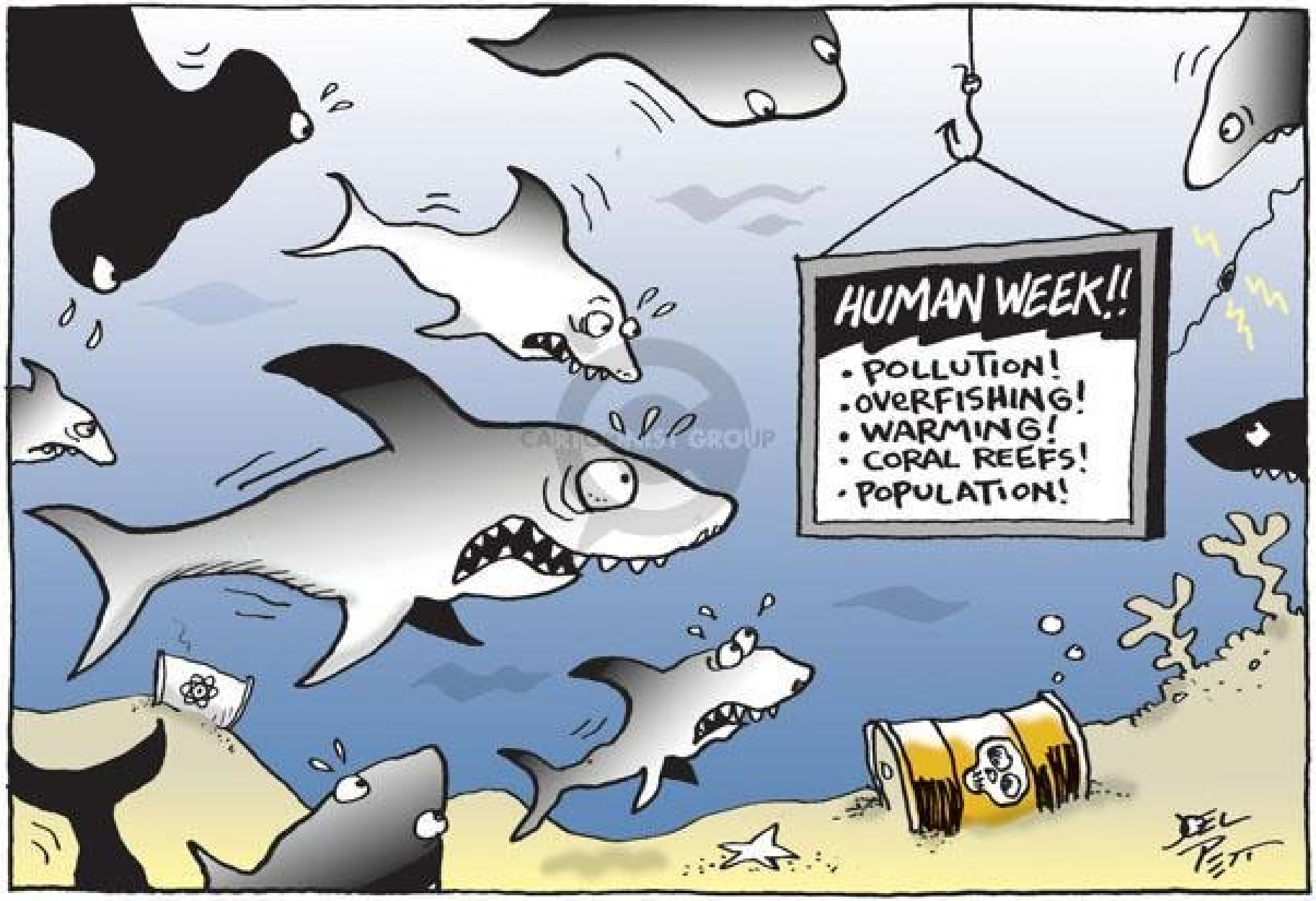
UNESCO Chair on Community Sustainability: from Local to Global
Brock University
October 30, 2022

Human Health

- Survival and well-being
- Free of diseases and capable of mentally and physically functioning/performing

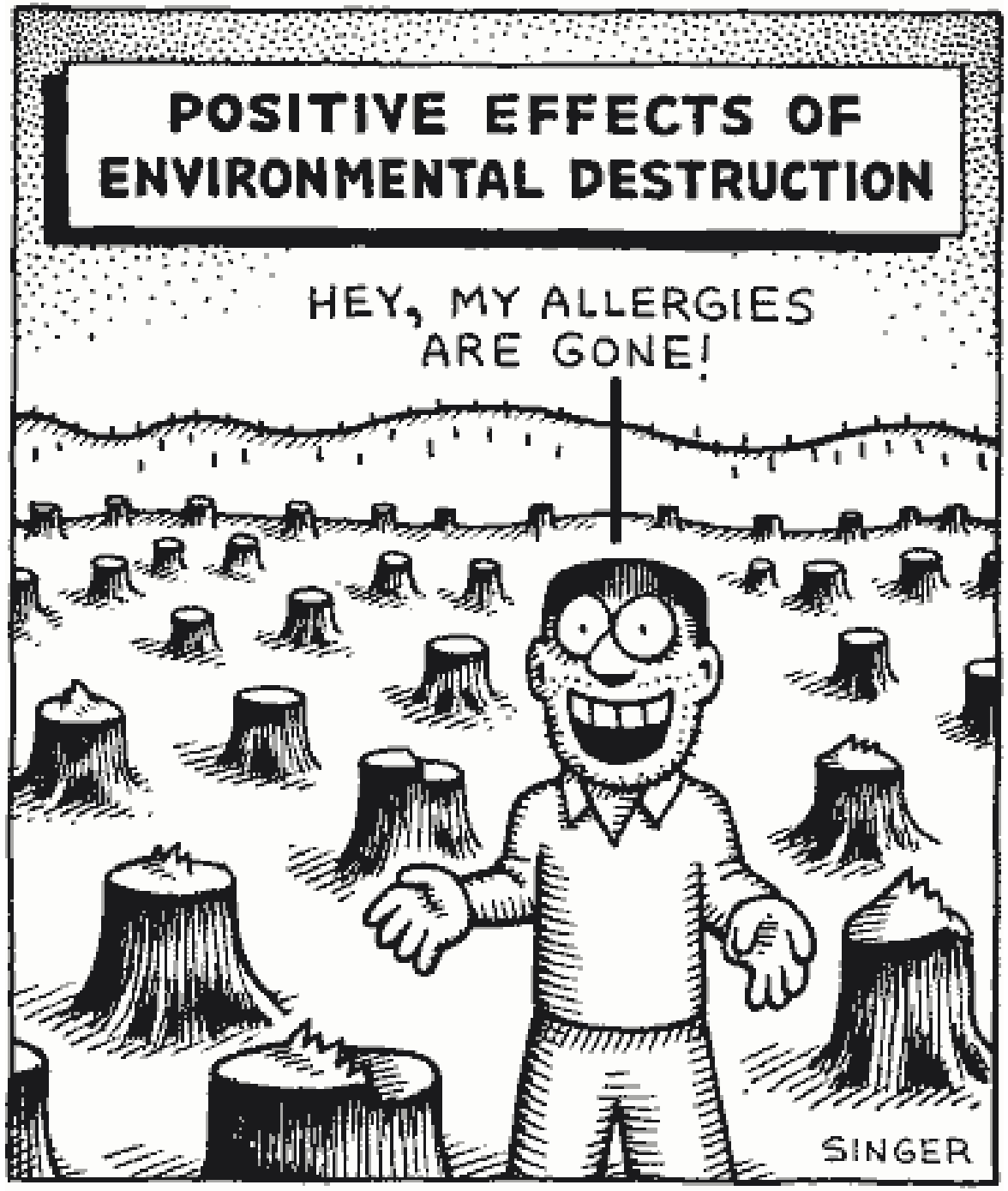
Humans and the planet




HUMAN WEEK!!
• POLLUTION!
• OVERFISHING!
• WARMING!
• CORAL REEFS!
• POPULATION!
JOEL PETT

© Joel Pett.

ANYONE WE KNOW IN THE EXTINCT COLUMN?
LYNCH


POSITIVE EFFECTS OF ENVIRONMENTAL DESTRUCTION
HEY, MY ALLERGIES ARE GONE!
SINGER

We only have one place

Credit: NOAA-NASA GOES Project

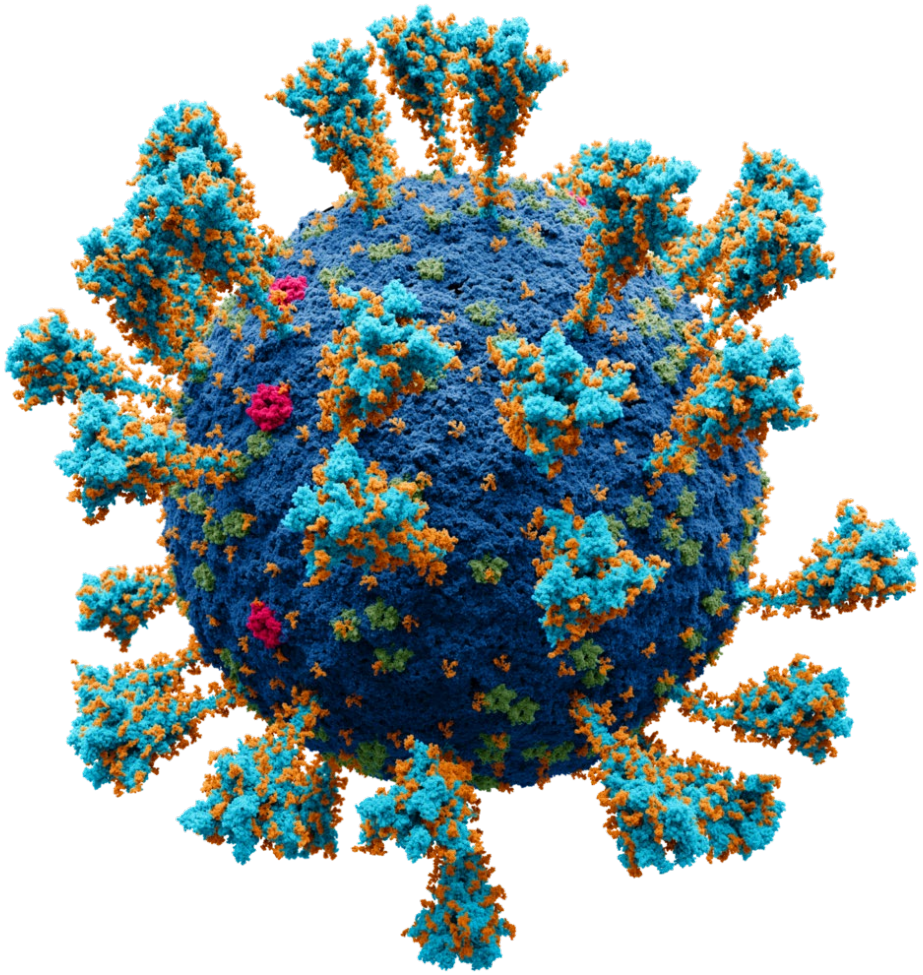
So, what should we do?

- The world is trying… with the SDGs 2030

But then… 2020

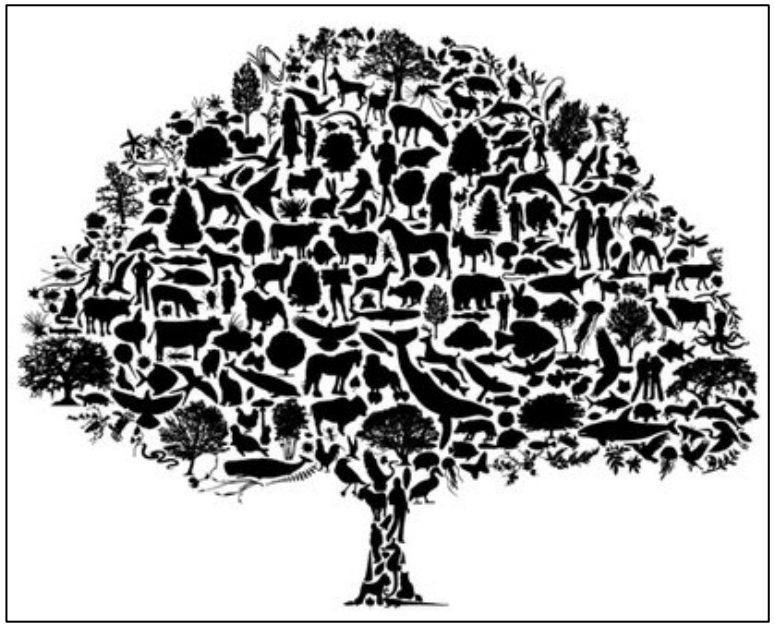
Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)
COVID-19 Pandemic

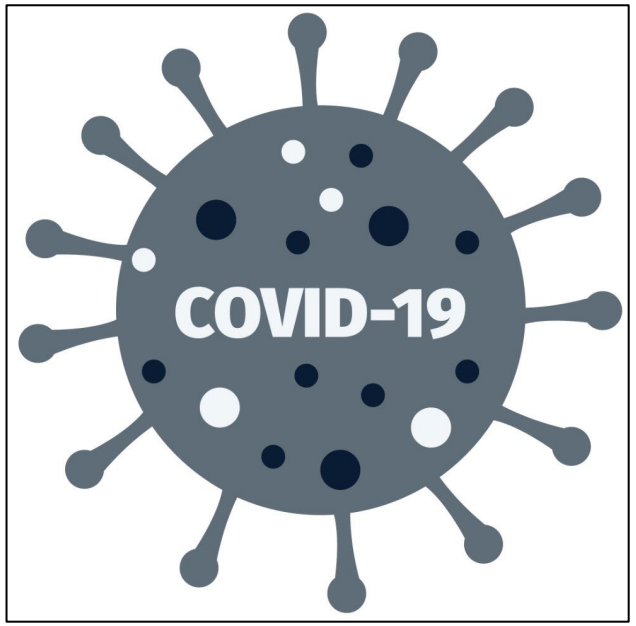
The world should have been changing

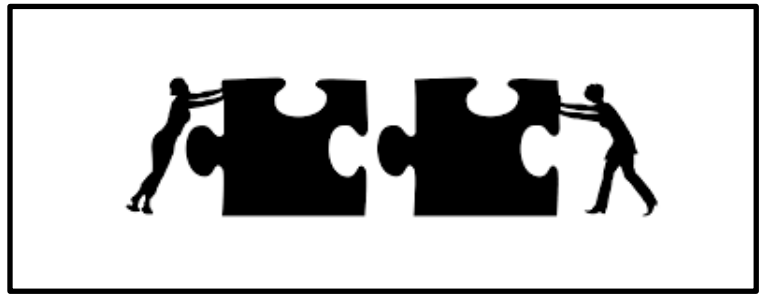


For human health: IGNITE project

- We need a healthy ecosystem
- The Commission on Ecosystem Management at the International Union for Conservation of Nature: Ignite Team on Ecosystem Management and Human Health





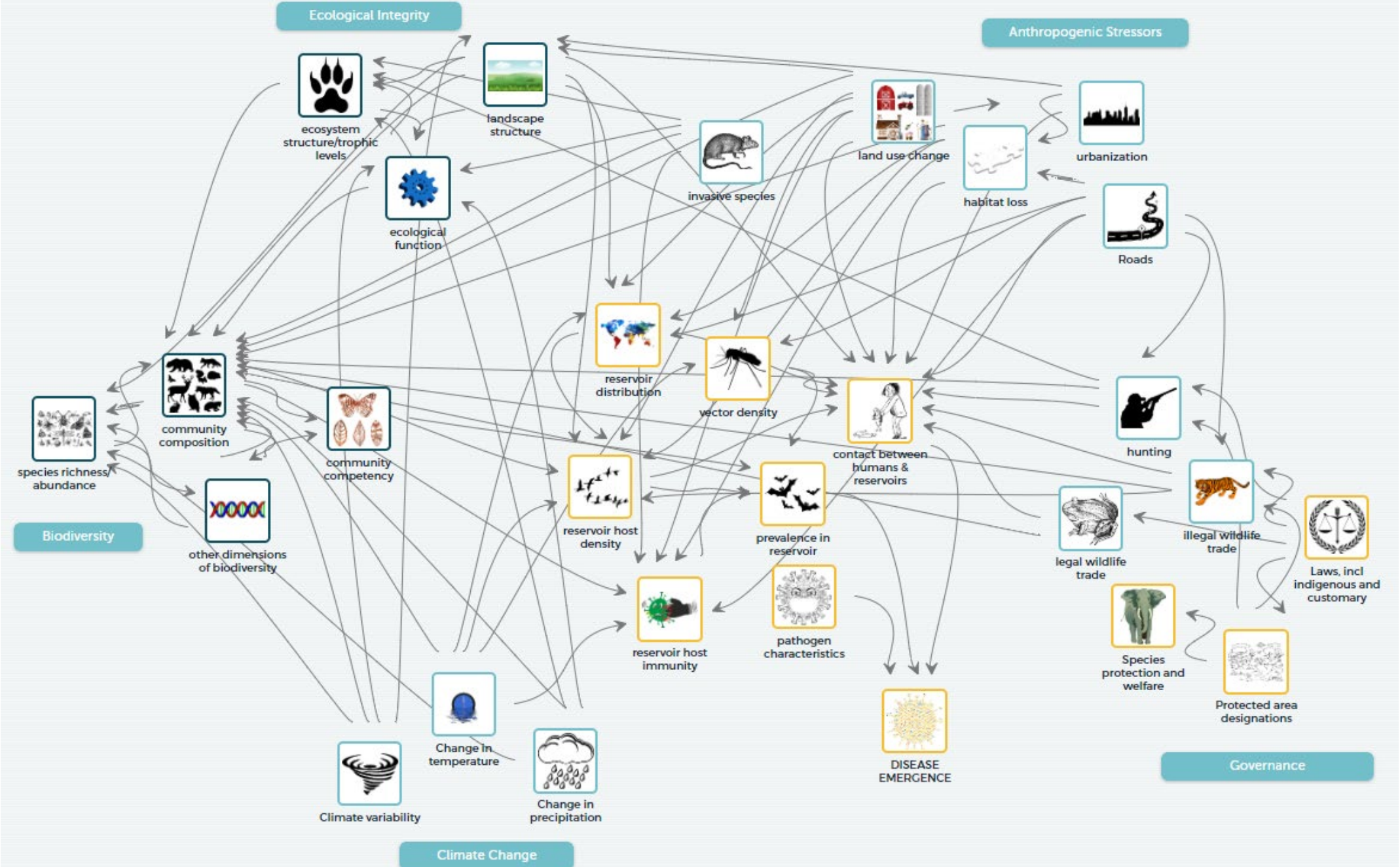


IUCN CEM

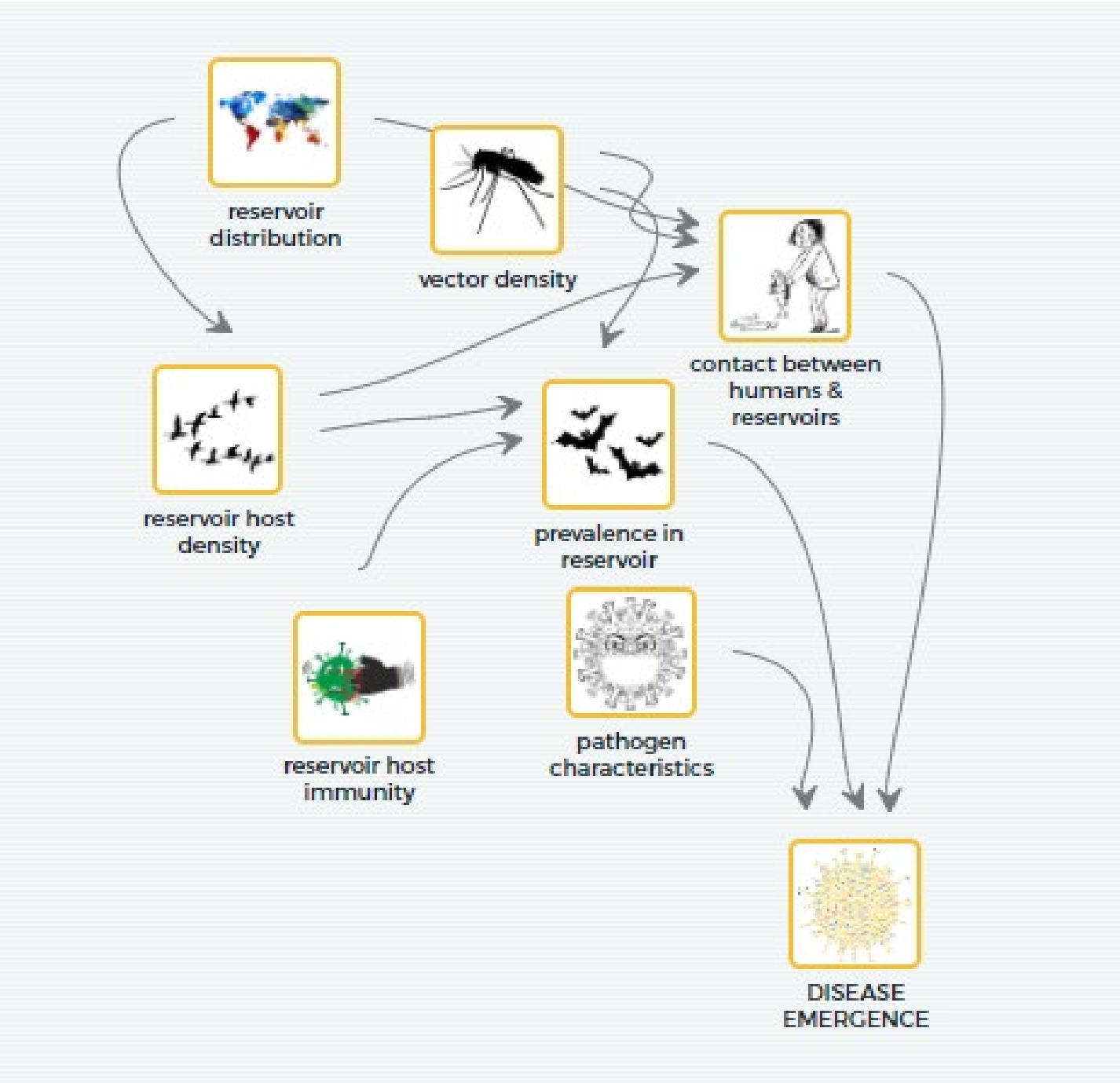
IUCN CEM Ignite Team – Ecosystem Management and Human Health

- **Angela Andrade***, Policy Director, Conservation International Colombia; Chair, International Union for Conservation of Nature's Commission on Ecosystem Management (IUCN CEM) (Colombia)
- **Rene Beyers***, Research Associate, Department of Zoology, University of British Columbia (Canada)
- **Stephen Carver**, Senior Leturer, School of Geography, University of Leeds; Co-chair, IUCN CEM Rewilding Thematic Group (UK)
- **Ian Convery**, Professor of Environment and Society, University of Cumbria; Co-chair, IUCN CEM Rewilding Thematic Group (UK)
- **Adam Eagle***, Chief Executive Officer, The Lifescape Project (UK)
- **Angie Luis***, Professor of Disease Ecology, University of Montana (USA)
- **Laurie B. Marczak**, Scientific Publications Manager, Institute for Health Metrics and Evaluation, University of Washington (USA)
- **Cara R. Nelson***, Professor of Restoration Ecology, University of Montana; Chair, IUCN CEM Ecosystem Restoration Thematic Group (USA)
- **Darrell Smith**, Lecturer, Centre for National Parks & Protected Areas, Department of Science, Natural Resources & Outdoor Studies (UK)
- **Gerardo Suzan***, Professor, Departamento de Etología y Fauna Silvestre, Facultad de Medicina Veterinaria y Zootecnia, Universidad Nacional Autónoma de México (Mexico)
- **Liette Vasseur***, Professor, Department of Biological Sciences, Brock University; Vice-chair, IUCN CEM North America and Chair, IUCN CEM Ecosystem Governance Thematic Group (Canada)
- **Paula Ribeiro Prist**, EcoHealth Alliance; Chair, IUCN CEM Human Health & Ecosystem Management Thematic Group (Bolivia/USA)

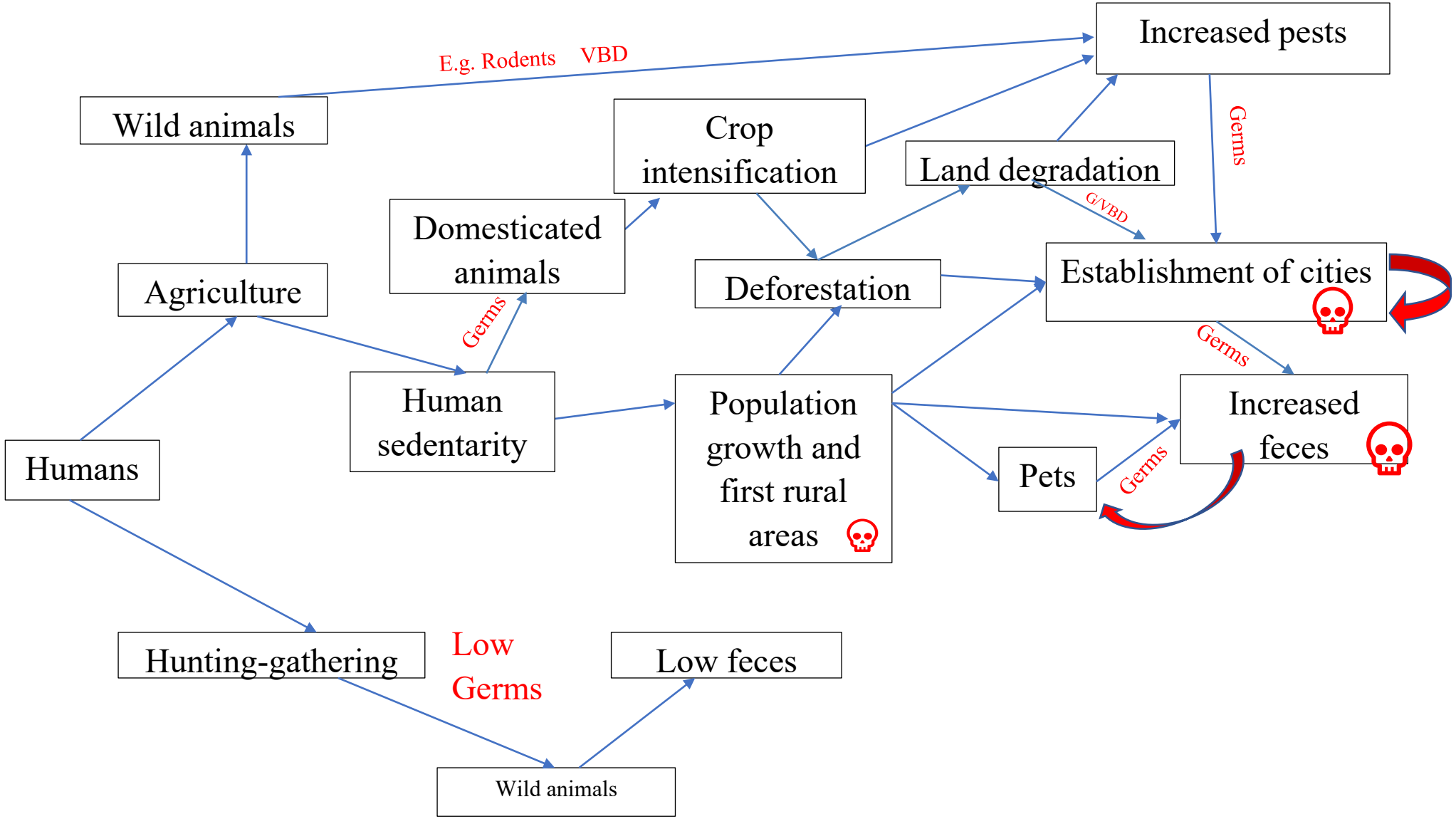
POTENTIAL INTERVENTION POINTS



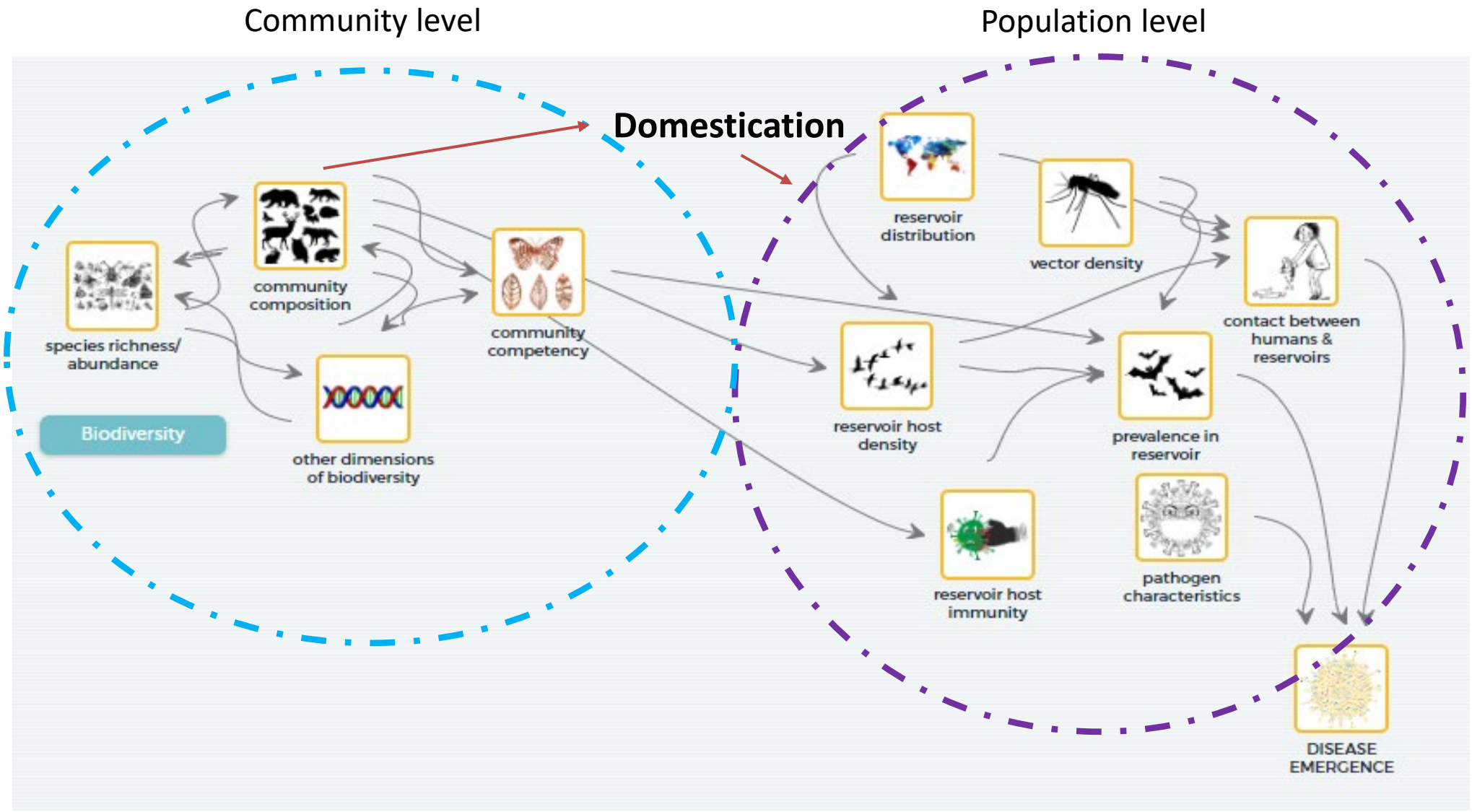
Disease emergence



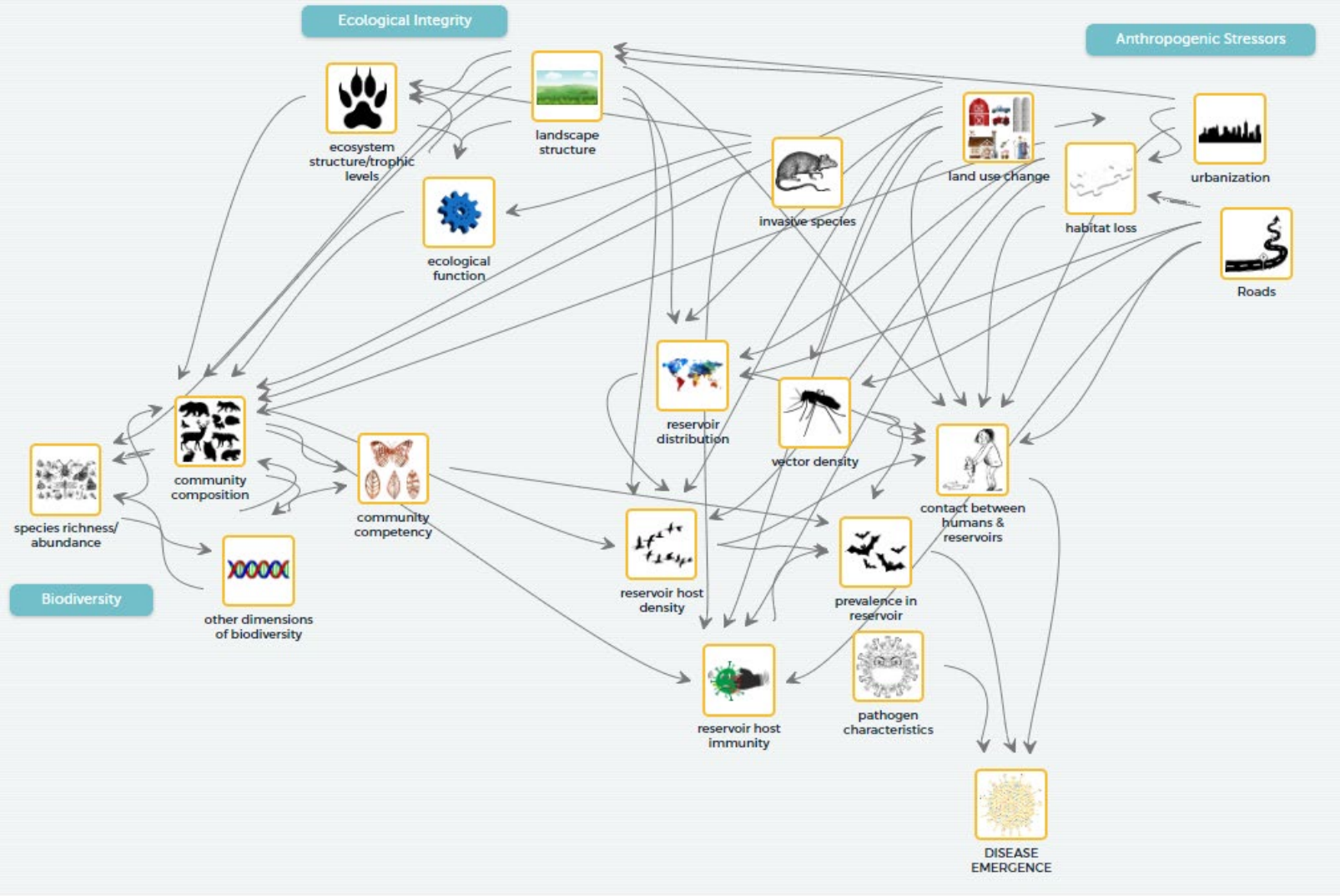
We forget our history



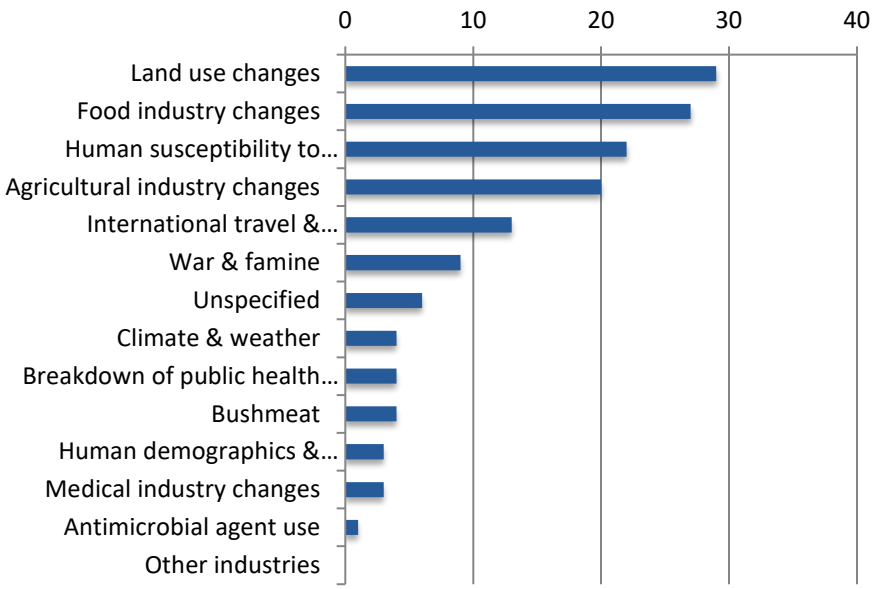
BIODIVERSITY AND DISEASE EMERGENCE



ECOLOGICAL INTEGRITY AND FUNCTION , LANDSCAPE STRUCTURE, LAND USE CHANGES, AND DISEASES

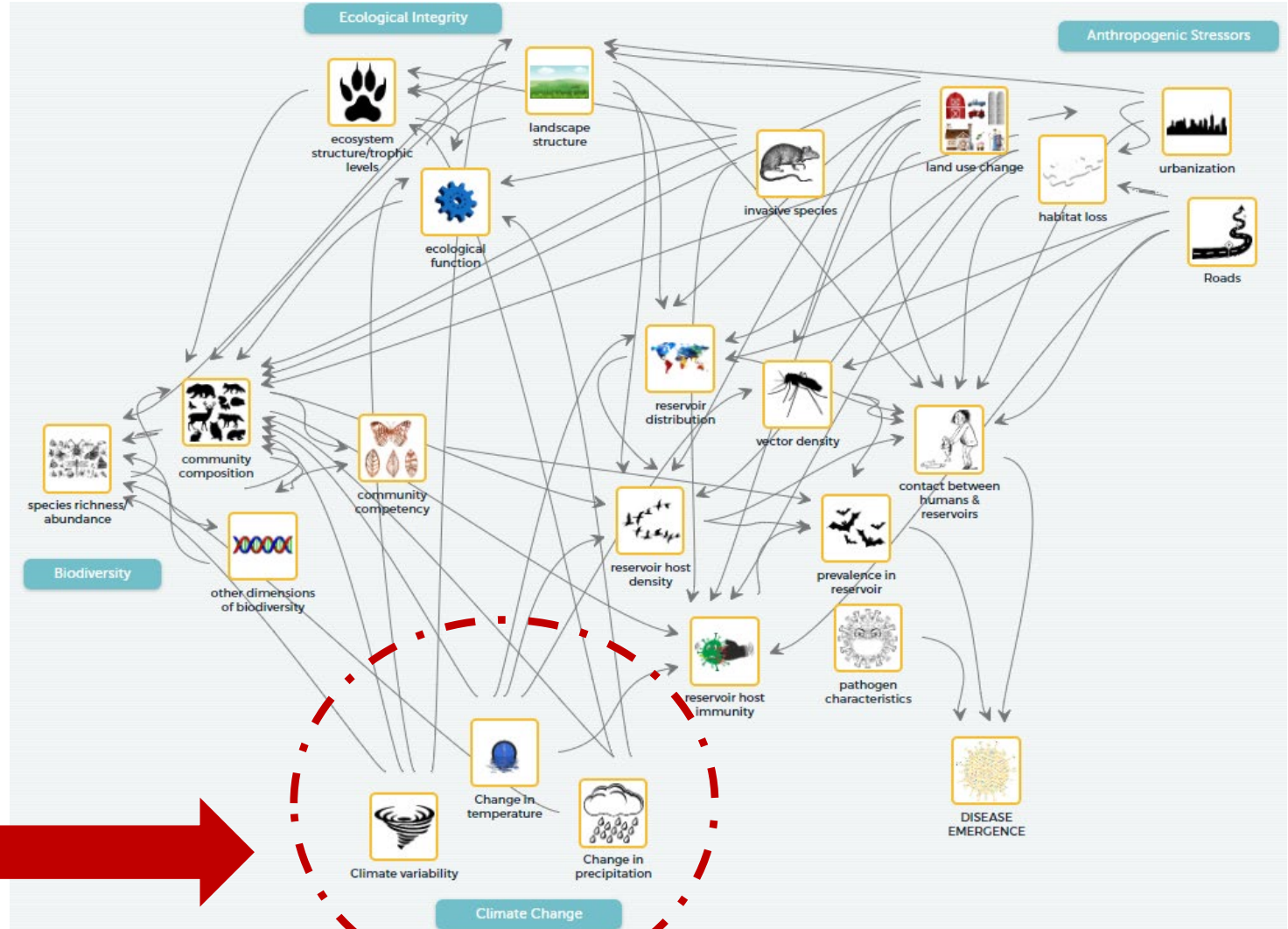


LAND USE CHANGES AND EMERGING DISEASES



https://geographical.co.uk/

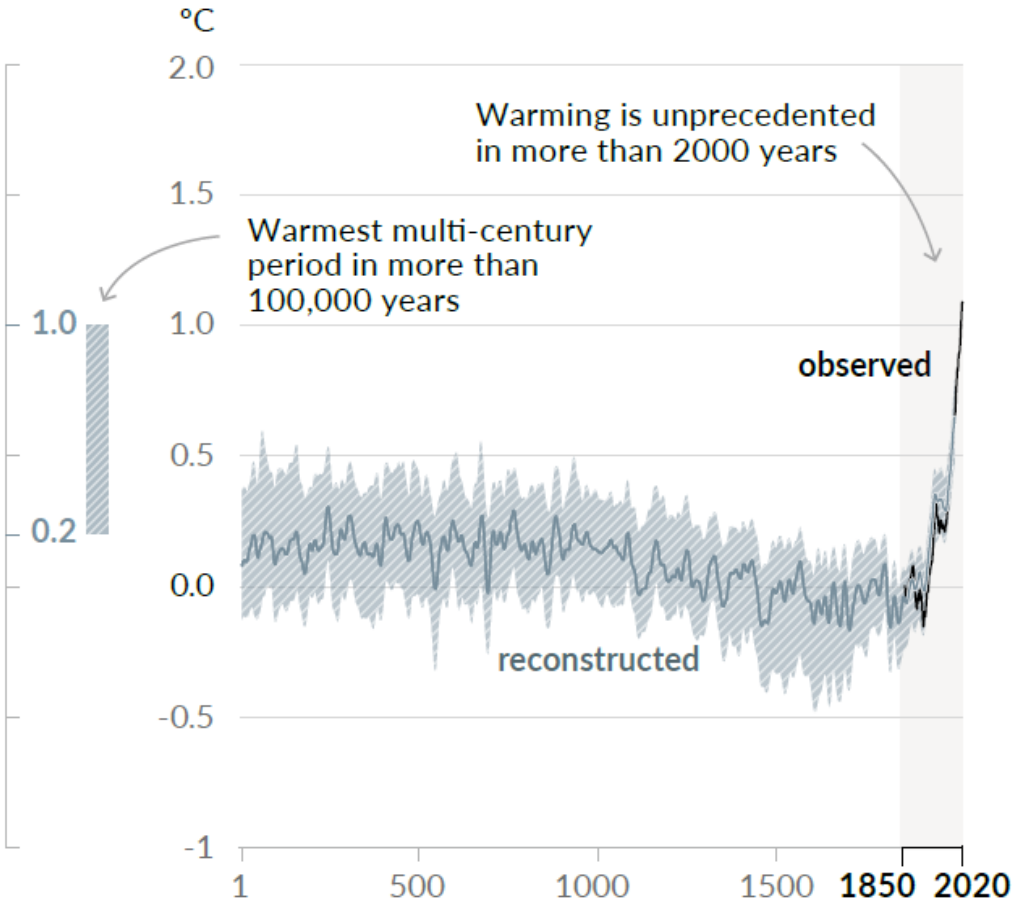
Connecting climate change to zoonoses



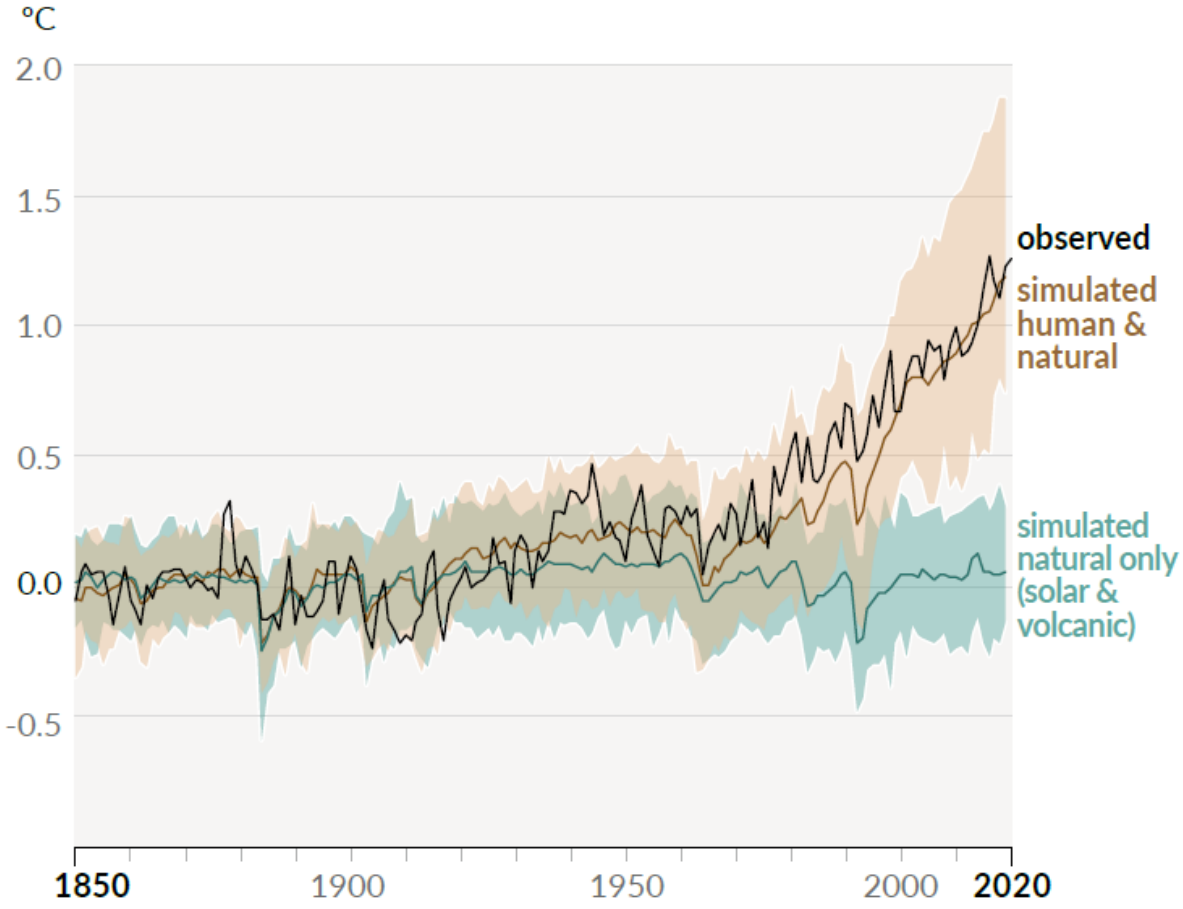
IPCC AR6

Changes in global surface temperature relative to 1850-1900

a) Change in global surface temperature (decadal average) as reconstructed (1-2000) and **observed** (1850-2020)



b) Change in global surface temperature (annual average) as **observed** and simulated using human & natural and only natural factors (both 1850-2020)



Unpredictable and extreme weather events

Hurricanes, storm surges, flooding, heat waves, ice storms, etc.
Changes in Intensity and Frequency
E.g., ↑heat days = ↑ in Chronic Obstructive Pulmonary Disease events

Long Term Climate Changes and Increased Climate Variability will affect different infectious disease risks

1

WARMING & CLIMATE VARIABILITY WILL CAUSE THE EPIDEMICS/RE-EMERGENCE OF ENDEMIC DISEASES

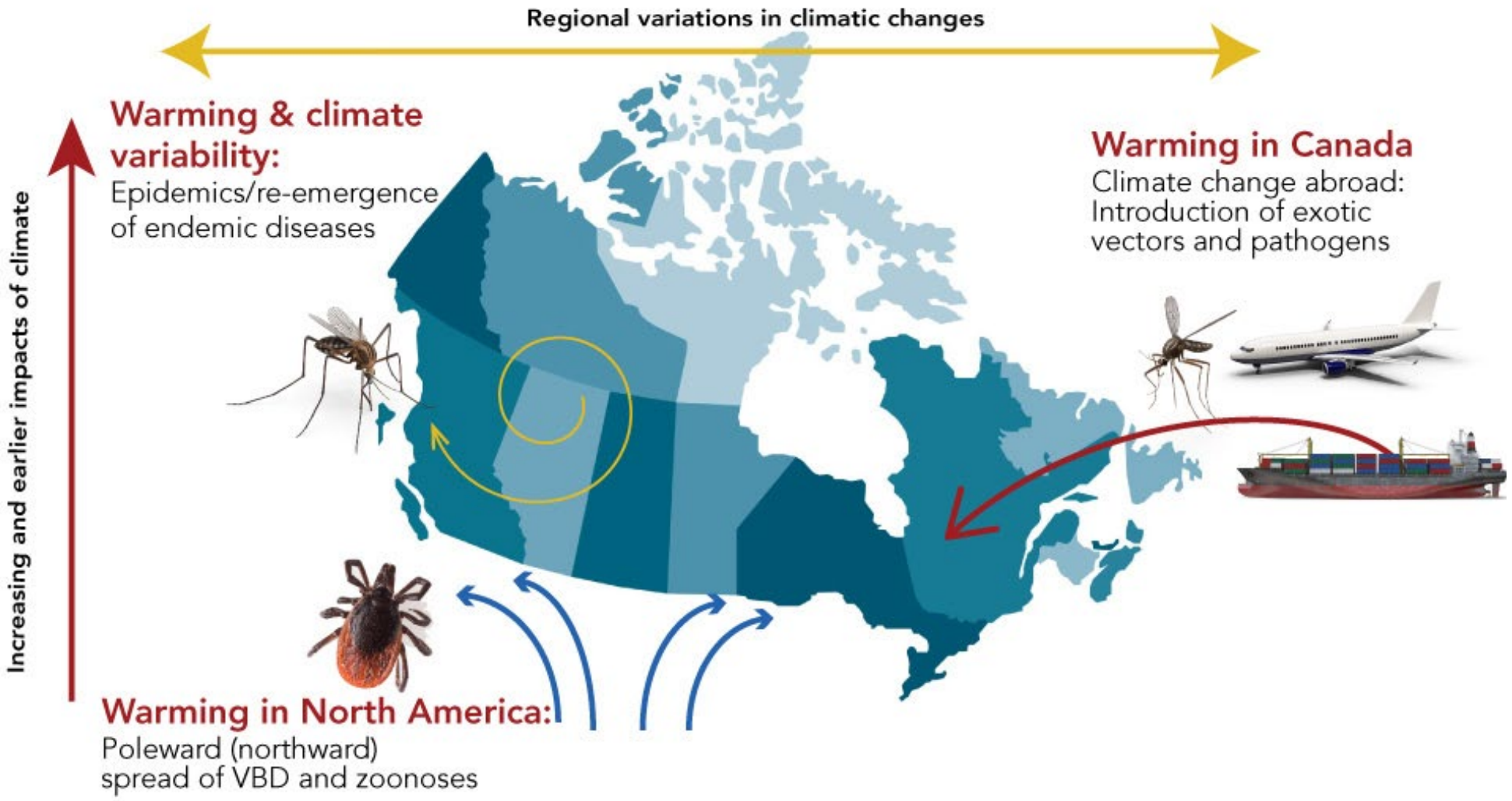
2

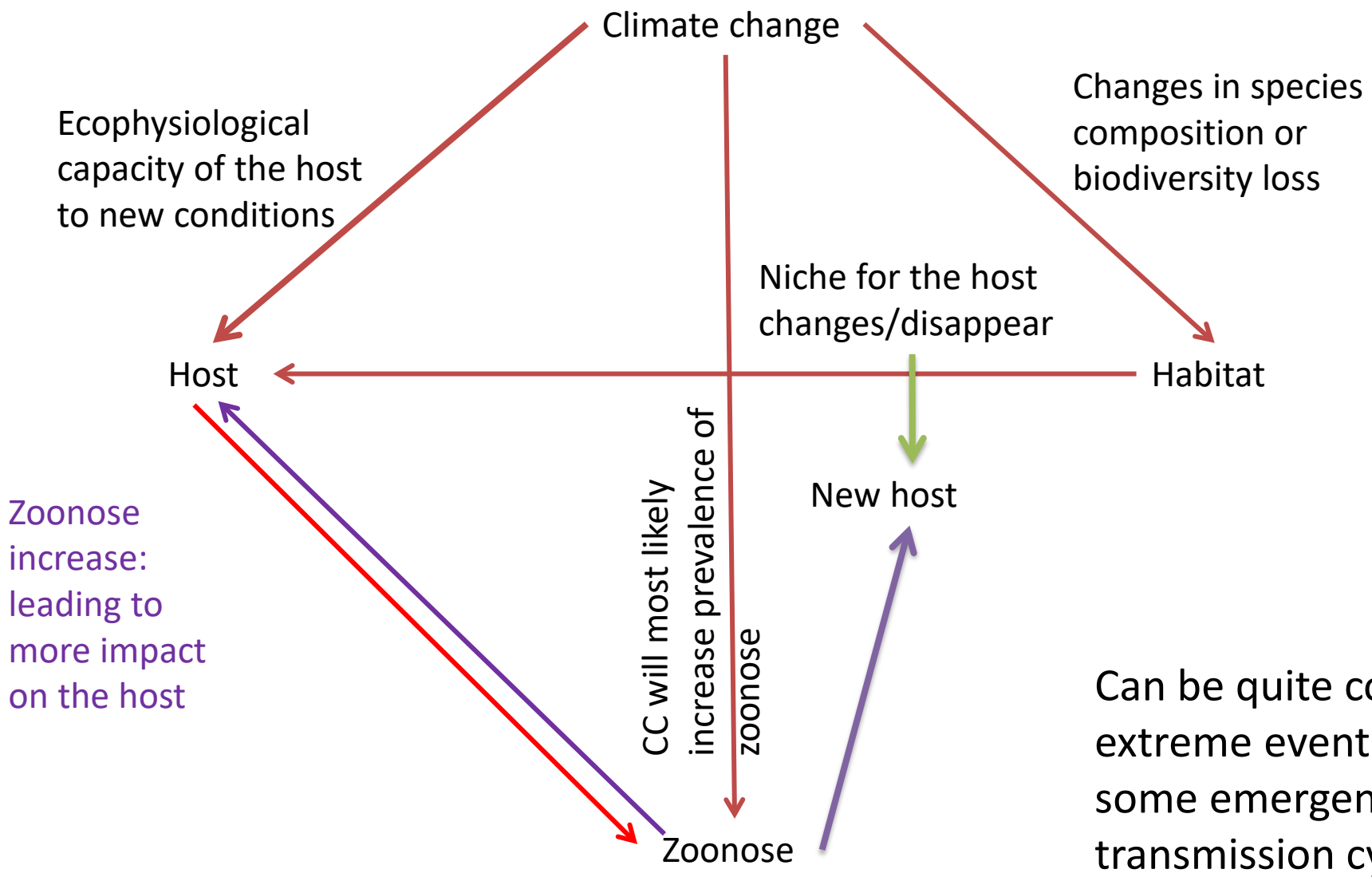
WARMING IN NORTHERN HEMISPHERE AND CLIMATE CHANGE ABROAD WILL INTRODUCE EXOTIC VECTORS AND PATHOGENS

3

WARMING IN NORTH AMERICA: POLEWARD (NORTHWARD) WILL LEAD TO THE SPREAD OF VBD AND ZOONOSES

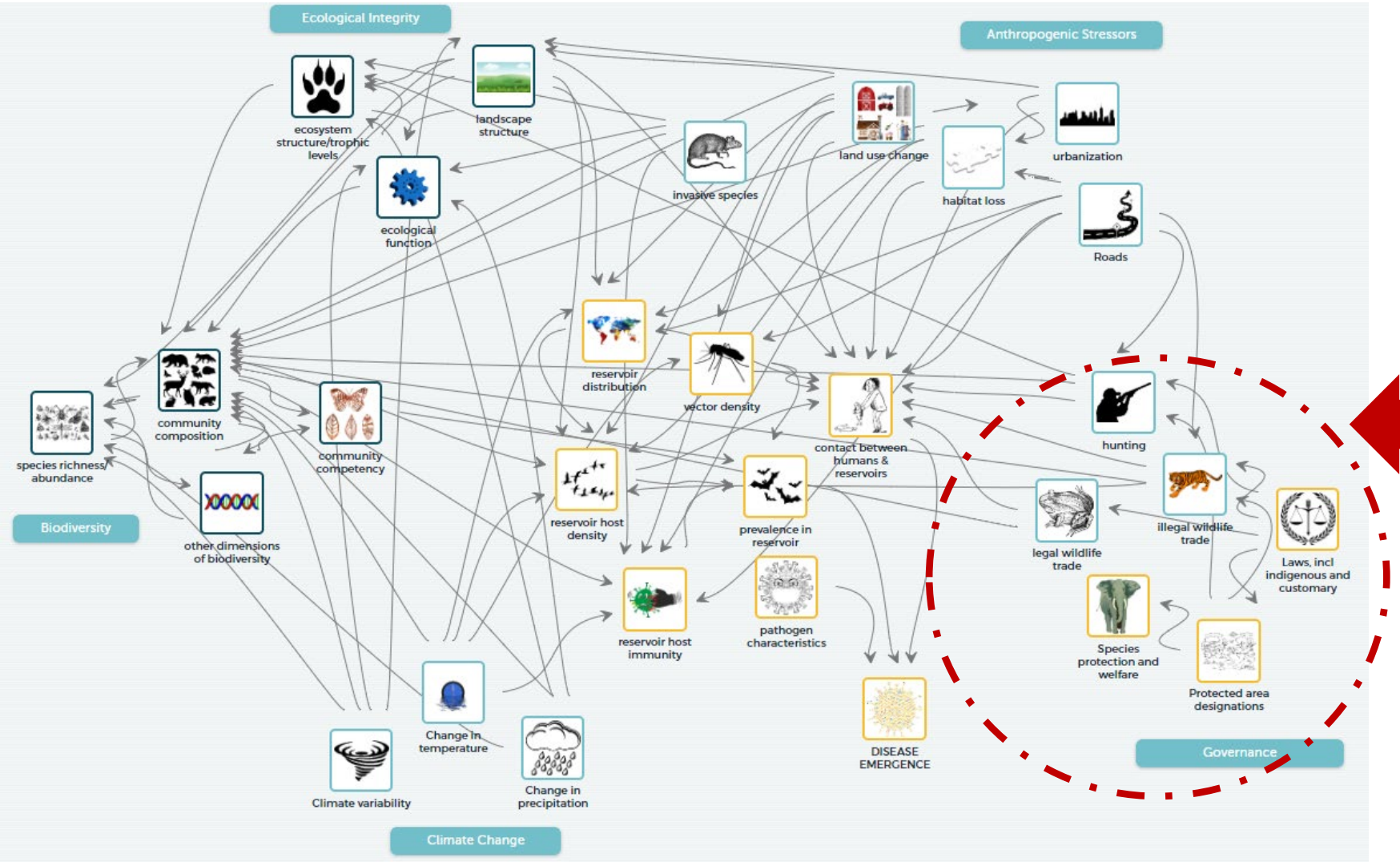
Zoonoses in Canada





Can be quite complex and extreme events may accelerate some emergence and transmission cycle…

GOVERNANCE – LEGAL AND REGULATORY ELEMENTS



The Rule of Law As a Factor Toward Disease Emergence

Factor 1: Constraints on Government Powers.
Factor 2: Absence of Corruption.
Factor 3: Open Government.
Factor 4: Fundamental Rights.
Factor 5: Order and Security.
Factor 6: Regulatory Enforcement.
Factor 7: Civil Justice.
Factor 8: Criminal Justice.

Regulatory Enforcement

Factor 6 measures the extent to which regulations are fairly and effectively implemented and enforced. Regulations, both legal and administrative, structure behaviors within and outside of the government. This factor does not assess which activities a government chooses to regulate, nor does it consider how much regulation of a particular activity is appropriate. Rather, it examines how regulations are implemented and enforced. For a further breakdown of Regulatory Enforcement by sub-factor, please refer to page 13.

Country/Jurisdiction	Factor Score*	Factor Rank
Denmark	0.90	1
Norway	0.87	2
Singapore	0.87	3
Netherlands	0.86	4
New Zealand	0.85	5
Sweden	0.85	6
Germany	0.85	7
Austria	0.84	8
Finland	0.84	9
Hong Kong SAR, China	0.82	10
United Kingdom	0.82	11
Australia	0.81	12
Belgium	0.81	13
Canada	0.81	14
Estonia	0.79	15
Japan	0.78	16
France	0.77	17
Republic of Korea	0.73	18
United States	0.73	19
United Arab Emirates	0.72	20
Czech Republic	0.70	21
Uruguay	0.69	22
Spain	0.68	23
Costa Rica	0.68	24
Chile	0.65	25
Portugal	0.64	26
Slovenia	0.64	27
Mauritius	0.63	28
Barbados	0.62	29
Croatia	0.55	44
Ghana	0.55	45
Senegal	0.55	46
South Africa	0.55	47
St. Vincent & the Grenadines	0.54	48
Bulgaria	0.54	49
Mali	0.54	50
Morocco	0.54	51
Jamaica	0.54	52
Tunisia	0.53	53
Malaysia	0.53	54
Argentina	0.52	55
Cote d'Ivoire	0.52	56
Algeria	0.52	57
Dominica	0.52	58
Brazil	0.52	59
Panama	0.51	60
Trinidad & Tobago	0.51	61
Bahamas	0.51	62
Kazakhstan	0.51	63
Benin	0.51	64
Belarus	0.50	65
Nepal	0.50	66
Colombia	0.50	67
Peru	0.50	68
Sri Lanka	0.49	69
Ecuador	0.49	70
Bosnia & Herzegovina	0.49	71
Russia	0.49	72
Guyana	0.46	86
Mexico	0.46	87
Burkina Faso	0.46	88
Kenya	0.46	89
Nicaragua	0.45	90
Malawi	0.45	91
Kyrgyzstan	0.45	92
Vietnam	0.45	93
Lebanon	0.44	94
Niger	0.44	95
Uzbekistan	0.44	96
Albania	0.44	97
Liberia	0.43	98
Guinea	0.43	99
Nigeria	0.43	100
Tanzania	0.43	101
Zambia	0.43	102
Ukraine	0.42	103
Uganda	0.42	104
Bangladesh	0.42	105
Turkey	0.42	106
Moldova	0.42	107
Guatemala	0.42	108
Angola	0.42	109
Belize	0.42	110
Cameroon	0.41	111
Bolivia	0.40	112
Honduras	0.40	113
Dominican Republic	0.39	114

Governance – Legal and Regulatory elements

Globally we have laws and regulations governing:

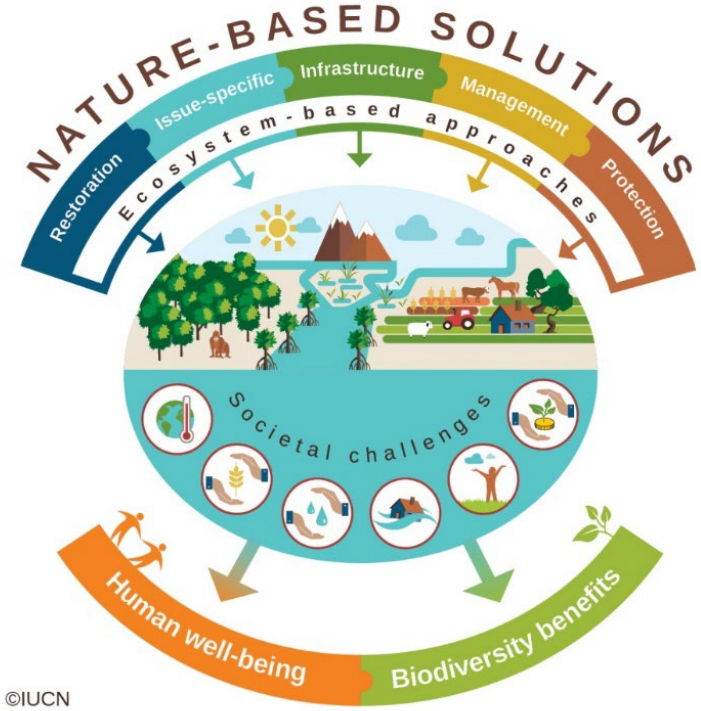
- Species Protection
- Wildlife Trade
- Animal Welfare
- Land use change and ‘planning law’ systems
- Protected Area Designations

Each of these areas has potential to impact emergence of disease, even if not intended to.

Transformative change

- Changing the worldview
- Requires reconnecting people and nature and traditions/cultural practices
- Requires a holistic view of the world
- System thinking

Nature-based solutions



- Going back to basic
- Promoting the resilience of both ecosystems and societies
- Improve the capacity of communities and ecosystems to adapt to changes and reduce disaster risks
- Essential for future generation: starting with youth

Why is it important?

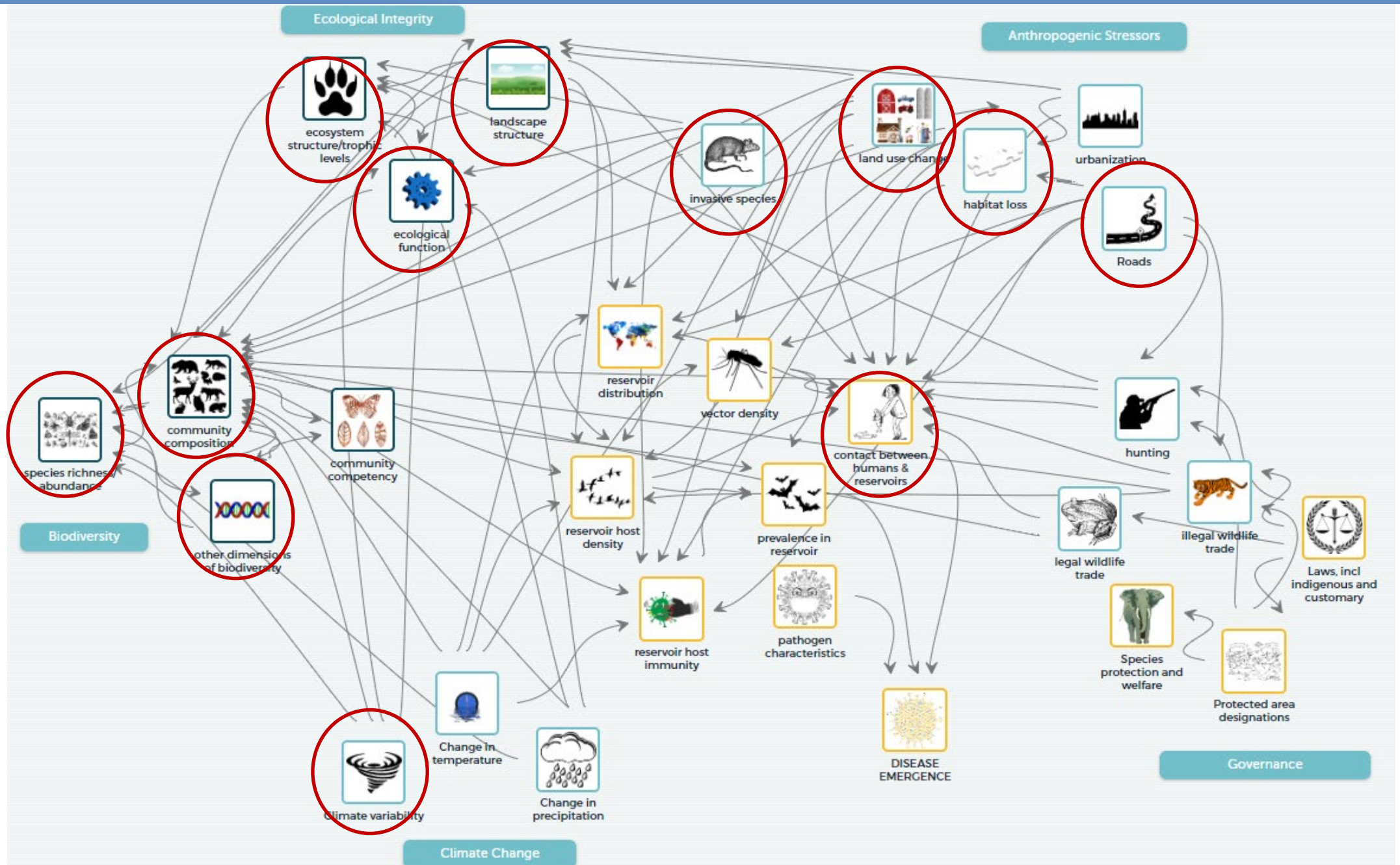
- Healthy (and resilient) ecosystem = healthy (and resilient) people
- Healthy ecosystems = diversity
- Healthy ecosystems = increased redundancy
- Healthy ecosystems = more capacity to withstand extreme events

NBS and emerging infectious disease (EID)

Potential of NBS to decrease risk of EID

- Protection of natural ecosystems
- Ecological restoration of disturbed habitat and biodiversity
- Restoration of the full trophic cascade (rewilding)
- Creating a separation buffer between pathogens and livestock / humans

POTENTIAL INTERVENTION POINTS



Future Directions: Global Conservation agenda

1. Standards of Practice

3 GOOD HEALTH AND WELL-BEING

GOOD HEALTH AND WELL-BEING: WHY IT MATTERS

What's the goal here?

To ensure healthy lives and promote well-being for all at all ages.

Why?

Ensuring healthy lives and promoting well-being for all at all ages is important to building prosperous societies.

Major progress has been made in improving the health of millions of people. Maternal and child mortality rates have been reduced, life expectancy continues to increase globally, and the fight against some infectious diseases has made steady progress.

However, in the case of other diseases such as malaria and tuberculosis, progress has slowed or stalled.

At least half the world's population are still without access to essential health services.

Spending **$1 billion** in immunization coverage can save **1 million** children's lives each year

Future Directions: Global Conservation agenda

1. Standards of Practice

2. Strategic Targets

15 LIFE ON LAND

Nature is critical to our survival: nature provides us with our oxygen, regulates our weather patterns, pollinates our crops, produces our food, feed and fibre. But it is under increasing stress. Human activity has altered almost 75 per cent of the earth's surface, squeezing wildlife and nature into an ever-smaller corner of the planet.

Around 1 million animal and plant species are threatened with extinction – many within decades – according to the 2019 Global Assessment Report on Biodiversity and Ecosystem Service. The report called for transformative changes to restore and protect nature. It found that the health of ecosystems on which we and all other species depend is deteriorating more rapidly than ever, affecting the very foundations of our economies, livelihoods, food security, health and quality of life worldwide.

Deforestation and desertification – caused by human activities and climate change – pose major challenges to sustainable development and have affected the lives and livelihoods of millions of people. Forests are vitally important for sustaining life on Earth, and play a major role in the fight against climate change. And investing in land restoration is critical for improving livelihoods, reducing vulnerabilities, and reducing risks for the economy.

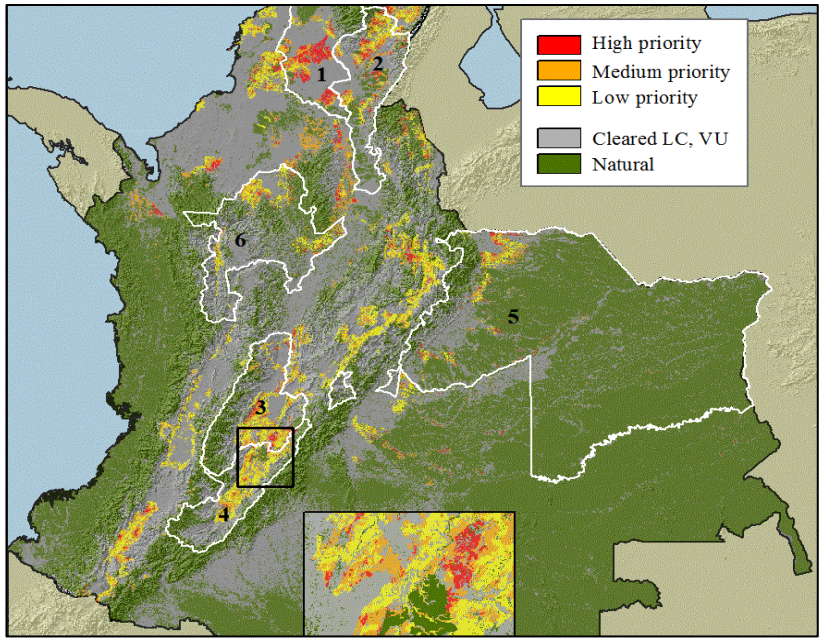
The health of our planet also plays an important role in the emergence of zoonotic diseases, i.e. diseases that are transmissible between animals and humans. As we continue to encroach on fragile ecosystems, we bring humans into ever-greater contact with wildlife, enabling pathogens in wildlife to spill over to livestock and humans, increasing the risk of disease emergence and amplification.

Future Directions: Global Conservation agenda

1. Standards of Practice

2. Strategic Targets

3.Prioritization



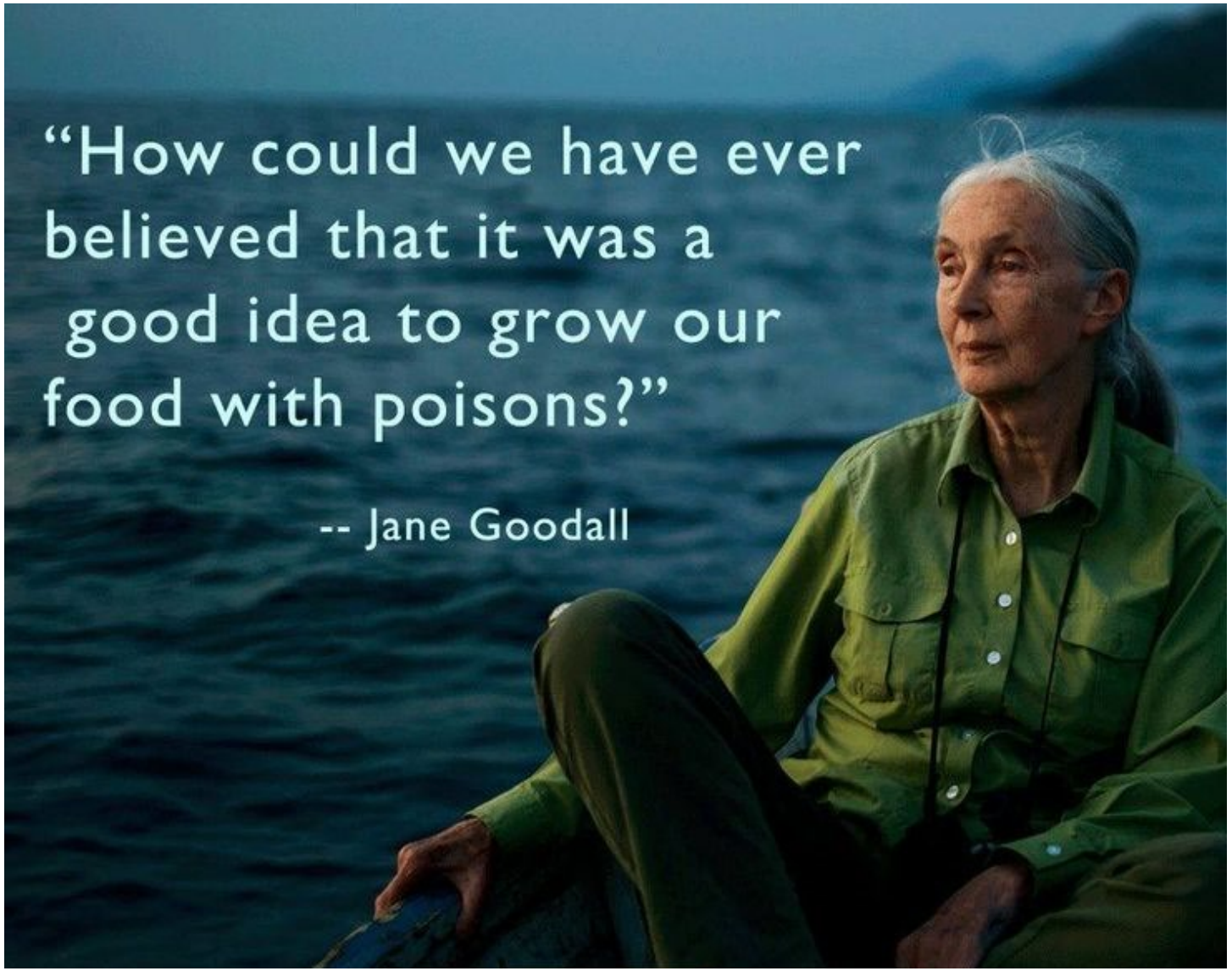
Forest Landscape Restoration Initiative 20 x 20

UN CBD

30% by 2030

Convention on Biological Diversity

Working in sustainable agriculture and sustainable rural communities…



Thank you!

- “Nature is our food, our doctor, also our economy."
- Hindou Oumarou Ibrahim, Coordinator, Association for Indigenous Women and Peoples of Chad

  (17 years old in 2016).