

ONEFOOD

The Grand Challenge

ONE**FOOD**

More, wealthier, urban = **altered demand/trade**

More **Competition** for land, energy and water

More food must be **produced with less**

Reduce **food Loss and waste**

Anthropogenic forcing altering land/water **suitability**

Food sectors/systems are not **climate-efficient**

Food systems negatively impact **biodiversity**

The Grand Challenge

ONEFOOD



'Reducing food loss and waste is an adequate solution for food security' – Qu Dongyu, DG FAO, World Food Forum, Oct 17-21, 2022

Hazards and food systems

ONE**FOOD**

High animal and plant **health** status critical for human health and existence

Up to **40%** of food crops destroyed by pests

Diverse hazards impact **food, safety** and **trade**

Driving **climate inefficiency, biodiversity loss**

Food systems are a pivot around which One Health policies can be operationalised



One Health – not just zoonotics

ONEFOOD



'a collaborative, multi-sectoral, and trans-disciplinary approach, working locally, regionally, nationally, and globally, to achieve optimal health and well-being of all animals, people, plants and their shared environment, recognizing their inextricable interconnections'

One Health approach needs application to specific issues and actioning in academia, government, industry, policy, society



**ONE HEALTH
JOINT PLAN OF ACTION
(2022-2026)**

**WORKING TOGETHER FOR
THE HEALTH OF HUMANS, ANIMALS,
PLANTS AND THE ENVIRONMENT**

**One Health in Agrifood
System Transformation Fund**

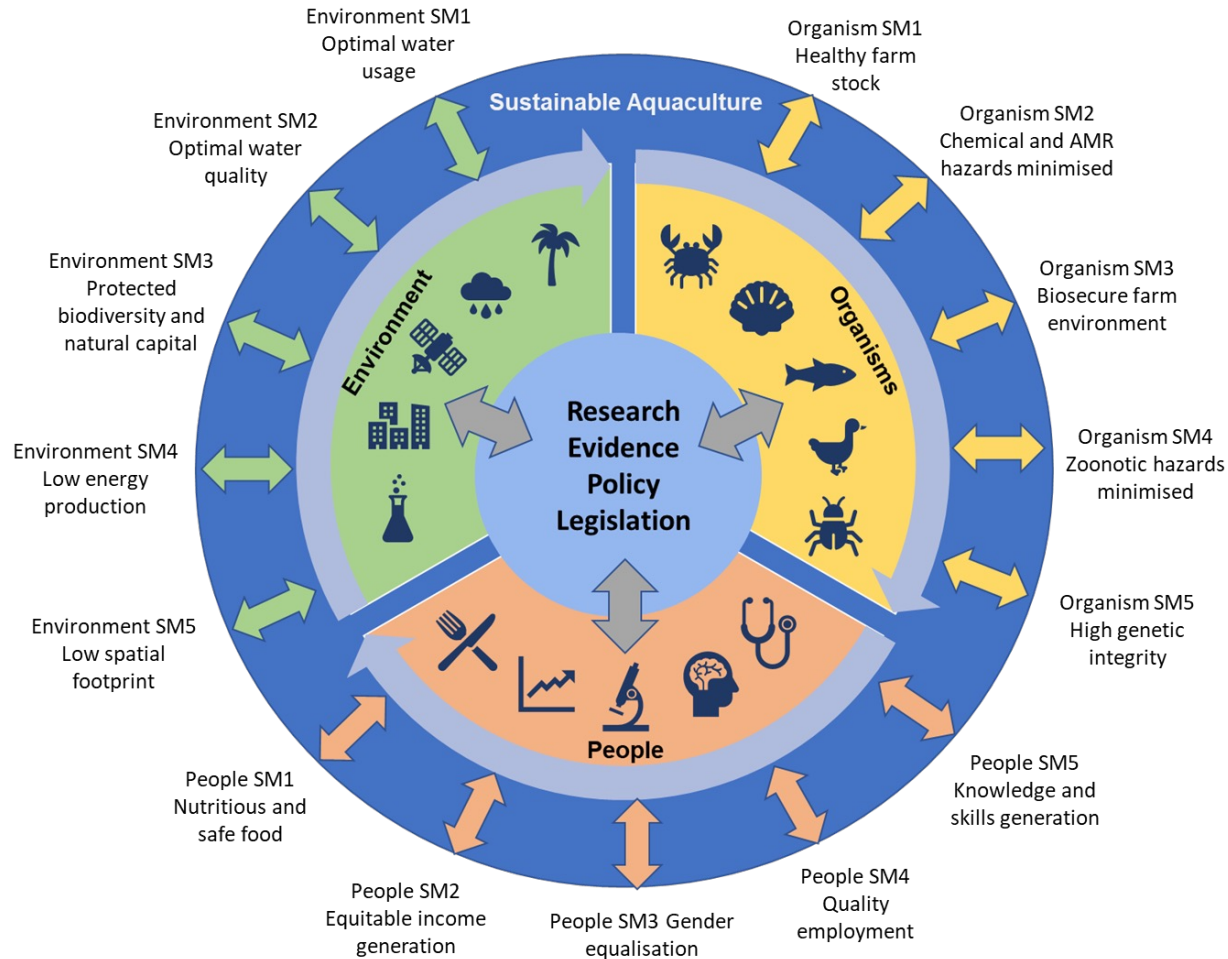
Safeguarding human, animal, plant and ecosystem health

'A One Health approach is key to achieving agrifood systems transformation and through this we can unlock multiple health, social, economic and environmental benefits.'

Dr QU Dongyu,
FAO Director-General

Nature Food 1, 468–474

#OneHealthAquaculture



Volume 1 Issue 8, 1 August 2020



One Health aquaculture

Aquaculture, the farming of aquatic animals and plants, is one of the fastest developing food sectors globally, and in recent years has become the main source of fish available for human consumption. Applying the principles of One Health – the interconnectedness of human, animal and planetary health – could well support enhanced sustainable production in aquaculture; facilitating food and nutrition security, poverty alleviation, economic development and the protection of natural resources.

See [Stentiford et al. show less](#)

PERSPECTIVE

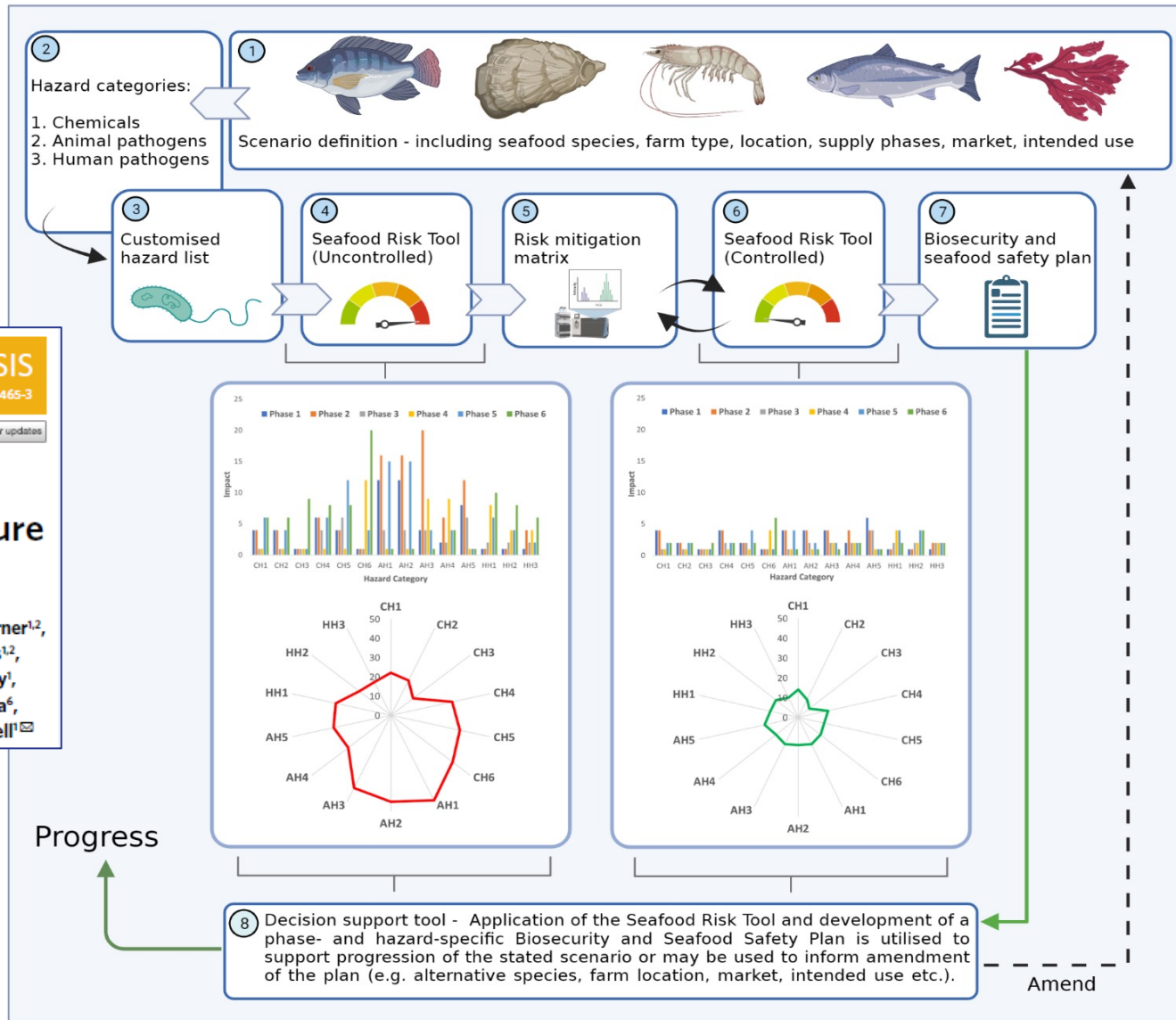
<https://doi.org/10.1038/s43016-020-0127-5>



Sustainable aquaculture through the One Health lens

G. D. Stentiford^{1,2} , I. J. Bateman³ , S. J. Hinchliffe^{2,4} , D. Bass^{1,2}, R. Hartnell⁵, E. M. Santos^{2,6} , M. J. Devlin⁷ , S. W. Feist¹, N. G. H. Taylor^{1,2}, D. W. Verner-Jeffreys^{1,2}, R. van Aerle^{1,2} , E. J. Peeler^{1,2}, W. A. Higman¹, L. Smith¹, R. Baines¹, D. C. Behringer^{8,9} , I. Katsiadaki^{1,2}, H. E. Froehlich^{10,11} and C. R. Tyler^{2,6}

De-risking supply chains



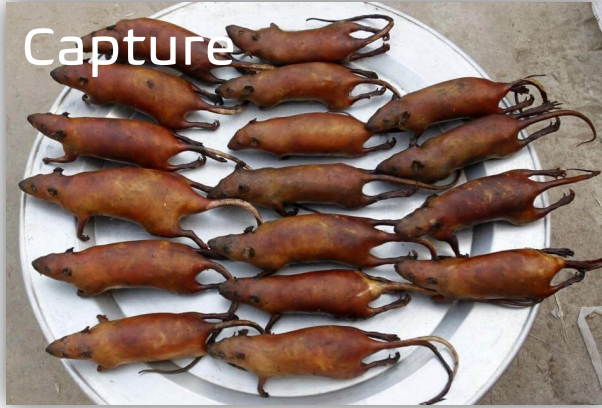
nature food ANALYSIS
<https://doi.org/10.1038/s43016-022-00465-3>
 Check for updates

OPEN
A seafood risk tool for assessing and mitigating chemical and pathogen hazards in the aquaculture supply chain

G. D. Stentiford^{1,2}, E. J. Peeler^{1,3}, C. R. Tyler^{2,4}, L. K. Bickley^{2,4}, C. C. Holt⁵, D. Bass^{1,2}, A. D. Turner^{1,2}, C. Baker-Austin^{1,2}, T. Ellis¹, J. A. Lowther¹, P. E. Posen¹, K. S. Bateman^{1,2}, D. W. Verner-Jeffreys^{1,2}, R. van Aerle^{1,2}, D. M. Stone¹, R. Paley¹, A. Trent¹, I. Katsiadaki^{1,2}, W. A. Higman¹, B. H. Maskrey¹, M. J. Devlin⁶, B. P. Lyons¹, D. M. Hartnell¹, A. D. Younger¹, P. Bersuder⁶, L. Warford⁶, S. Losada⁶, K. Clarke⁶, C. Hynes⁶, A. Dewar⁶, B. Greenhill⁶, M. Huk⁶, J. Franks⁶, F. Dal-Molin⁶ and R. E. Hartnell¹

Nature Food 3, 169–178 (2022)

But, supply chains are diverse...



Towards 'One Food'...

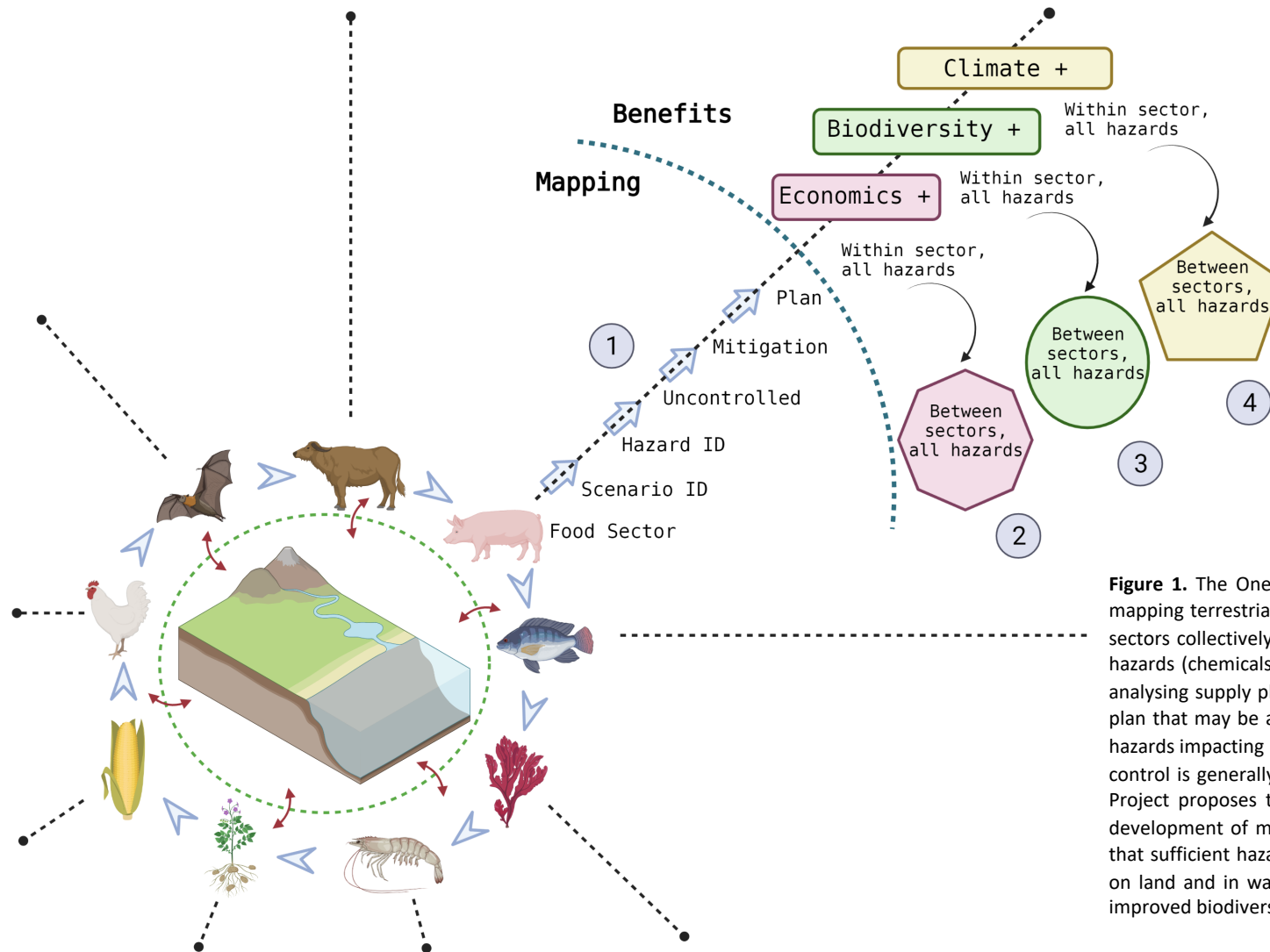


Figure 1. The One Food project will develop (1) a systems-based approach to comprehensively mapping terrestrial and aquatic food sectors and scenarios (– e.g., trade, consumption patterns) – sectors collectively forming the national ‘food system’, and those sector-specific and cross-sector hazards (chemicals, pathogens) with potential to interrupt safe and sustainable supply chains. By analysing supply phase-specific options for hazard mitigation, the project will outline a mitigation plan that may be appropriate to specific hazards acting upon specific sectors through to multiple hazards impacting multiple sectors within a given food system. Whilst benefits realisation of hazard control is generally articulated via improvements in yield, trade or food safety (2), the One Food Project proposes to extend the concept to benefits to natural systems/biodiversity (3) and, to development of more climate-efficient food sectors (4). The One Food concept argues therefore that sufficient hazard identification and control, designed in to interlinked food sectors operating on land and in water, offers tangible benefits which extend beyond safe and sufficient food, to improved biodiversity and climate-related efficiency associated with the food system.

One Food anatomy

Articulate benefits of hazard control for climate efficiency

SUSTAINABLE ENVIRONMENT 2022, VOL. 8, NO. 1, 2115685
<https://doi.org/10.1080/27688111.2022.2115685>
 ENVIRONMENTAL CHEMISTRY, POLLUTION & WASTE MANAGEMENT | SHORT COMMUNICATION | OPEN ACCESS | Check for updates

Food loss and waste: A carbon footprint too big to be ignored
 You Siming^a, Christian Sonne^b, Young-Kwon Park^c, Sunil Kumar^d, Kun-Yi Andrew Lin^e, Yong Sik Ok^f and Feng Wang^g

Contents lists available at ScienceDirect
Science of the Total Environment
 ELSEVIER
 journal homepage: www.elsevier.com/locate/scitotenv

Review
 A systems approach to assessing environmental and economic effects of food loss and waste interventions in the United States^a
 Mary K. Muth^{a,*}, Catherine Birney^b, Amanda Cuéllar^c, Steven M. Finn^d, Mark Freeman^e, James N. Galloway^f, Isabella Gee^g, Jessica Gephart^h, Kristal Jones^h, Linda Low^h, Ellen Meyerⁱ, Quentin Read^h, Travis Smith^j, Keith Weitz^k, Sarah Zoubeck^k

Improved mapping of hazards in food systems



Food Systems Dashboard

Develop a new economic toolbox for whole system

Rev. Sci. Tech. Off. Int. Epiz., 2021, 40 (2), 567-584

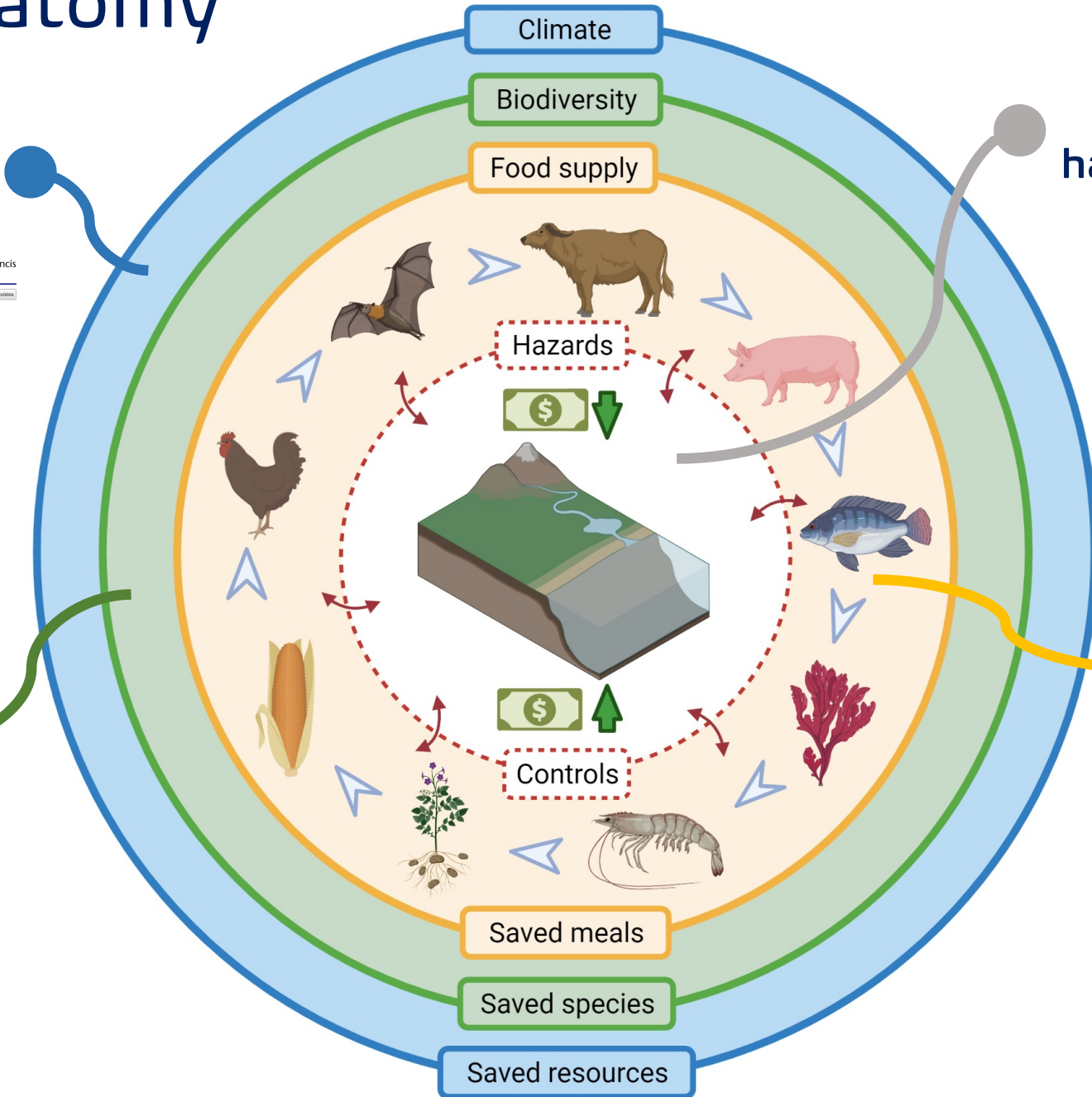
Global Burden of Animal Diseases: a novel approach to understanding and managing disease in livestock and aquaculture

B. Huntington^{1,2}, T.M. Bernardo³, M. Bondad-Reantaso⁴, M. Bruce⁵, B. Devleeschauwer^{6,7}, W. Gilbert⁸, D. Grace^{9,9}, A. Havelaar¹⁰, M. Herrero¹¹, T.L. Marsh¹², S. Mesenhowski¹³, D. Pendell¹⁴, D. Pigott¹⁵, A.P. Shaw^{16,16}, D. Stacey¹⁷, M. Stone¹⁸, P. Torgerson¹⁹, K. Watkins²⁰, B. Wieland²¹ & J. Rushton¹¹

nature ecology & evolution ARTICLES
<https://doi.org/10.1038/s41559-018-0793-y>

The global burden of pathogens and pests on major food crops

Serge Savary¹, Laetitia Willocquet², Sarah Jane Pethybridge³, Paul Esker⁴, Neil McRoberts⁵ and Andy Nelson^{6*}



Articulate benefits of hazard control for biodiversity

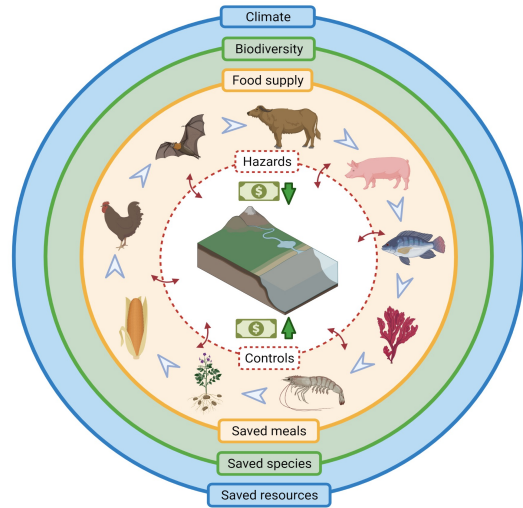
Research Paper
Food system impacts on biodiversity loss
 Three levers for food system transformation in support of nature
 February 2021
 Tim G. Benton, Carling Bieg, Helen Harwatt, Roshan Pudasaini and Laura Wellesley



'There is food and there is love. In that order'



David Hockney - 'Fish & Chip Shop'



Food systems are a pivot around which One Health policies can be operationalised