

MODULE 6 - TRANSFORMING BLUE ECONOMY SECTORS TOWARDS SUSTAINABILITY



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Business



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200 RESEARCHERS	100 PROJECTS	120 COUNTRIES	150 CONFERENCES	1,000 PUBLICATIONS	500_M MILLION FUNDING
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Innovative Systems for the Sustainable Interaction between Nature- Society - Economy

Research and Innovation Centers

Innovation Acceleration Hubs

Research laboratory on Socio-Economic and Environmental Sustainability

ReSEES

ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS

ReSEES Research Laboratory - Athens University of Economics and Business

Stochastic Modeling and Applications Laboratory

ATHENS UNIVERSITY OF ECONOMICS AND BUSINESS

Stochastic Modeling and Applications Laboratory - Athens University of Economics and Business

ATHENA

Research & Innovation Information Technologies Sustainable Development Unit

Sustainable Development Unit - Athena Research Center

DTU

DTU Management Department of Technology, Management and Economics

Department of Technology, Management, and Economics - Technical University of Denmark

United Nations Climate Change Global Innovation Hub

UN Climate Change Global Innovation Hub

eit Climate-KIC

Climate-KIC is supported by the EIT, a body of the European Union

EIT Climate-KIC

BRIGAD CONNECT

Brigaid Connect

MENA MARITIME Accelerator

MENA Maritime Accelerator

The Black Sea Accelerator

Black Sea Accelerator

Science - Policy Networks

Scientific Associations and Academies

Sustainable Development Solutions Network (SDSN)

Sustainable Development Solutions Network (SDSN)

SDSN Global Climate Hub

SDSN Global Climate Hub

SDSN Europe

SDSN Europe

SDSN Greece

SDSN Greece

Water Europe

Water Europe

Nexus cluster

Nexus cluster

THE EARTH-HUMANITY COALITION

Earth-Humanity Coalition (EHC)

Earth-Humanity Coalition (EHC)

World Council of Environmental and Resource Economists (WCERA)

World Council of Environmental and Resource Economists (WCERA)

European Association of Environmental and Resource Economists (EAERE)

European Association of Environmental and Resource Economists (EAERE)

World Academy of Art and Science (WAAS)

World Academy of Art and Science (WAAS)

Academia Europaea

Academia Europaea

European Academy of Sciences and Arts

European Academy of Sciences and Arts

InterAcademy Partnership (IAP)

InterAcademy Partnership (IAP)

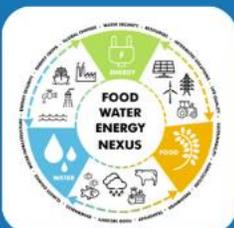
Academy of Engineering and Technology of Developing World (AETDEW)

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Transformations for Systems Sustainability



Climate Neutrality - Resilience



WFEB LULUCF



Oceans Seas



Socio-Economics Financial



Innovation Acceleration



Education Skills



Prof. Phoebe Koundouri Founder and Scientific Chair



- 1 The blue economy context
- 2 What is 'sustainability transformation'?
- 3 Approach and tools: System innovation Approach
 - Living lab and stakeholder engagement
 - Technological innovation
 - Social innovation
- 4 Application to the Black Sea

THE BLUE ECONOMY

TRADITIONAL SECTORS



FISHERIES



TOURISM



SHIP
BUILDING



SHIPPING



OFFSHORE
O&G



EMERGING SECTORS



MARINE RENEWABLE
ENERGY



AQUACULTURE

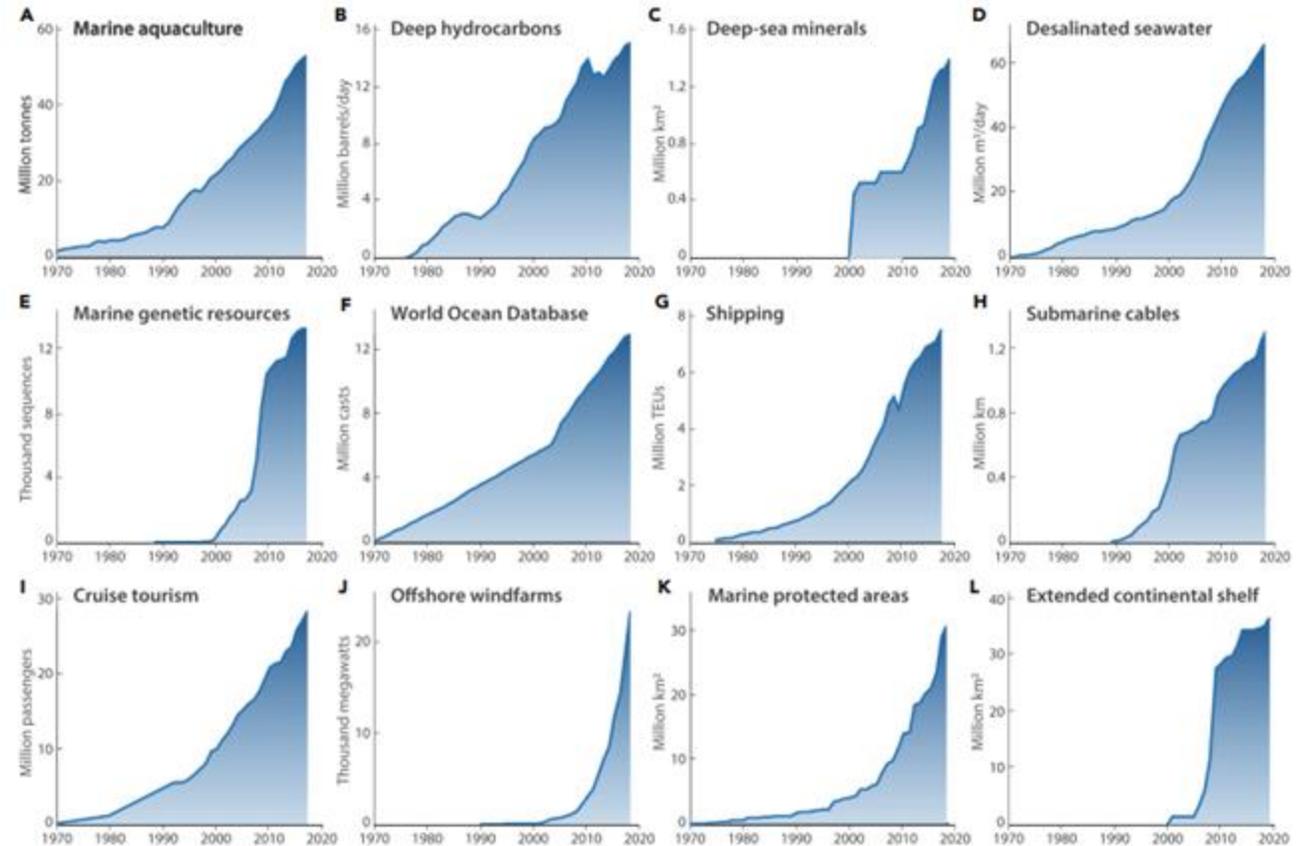


BIO-TECH



BRIDGE-BS

THE BLUE ACCELERATION



Jouffray, J. B., Blasiak, R., Norström, A. v., Österblom, H., & Nyström, M. (2020). *The Blue Acceleration: The Trajectory of Human Expansion into the Ocean*. *One Earth*, 2(1), 43–54. <https://doi.org/10.1016/J.ONEEAR.2019.12.016>

Dramatic impacts on marine ecosystems

1 Critical indicators reveal that business as usual is going to result in the collapse of key biophysical ocean functions, with major implications for the global economy and societies

2 A new relationship between humanity and the ocean is required.



BLACK SEA CONTEXT

BLACK SEA MULTISTRESSORS



BRIDGE-BS

Definition:

Sustainability transformation refers to the **fundamental and systemic changes** necessary to transition towards a more sustainable and resilient society, economy, and environment.

It involves **shifting from current unsustainable patterns** of production, consumption, and resource use, to pathways that promote **long-term ecological balance, social equity, and economic prosperity**.



The FAO Blue transformation for the fishery and aquaculture sectors

- 1 A **vision** for FAO's work on aquatic food systems
- 2 A **roadmap** 2022-2030 for Blue Transformation
- 3 Focuses on the elements that would **maximize the contribution of aquatic food systems to the SDGs**
- 4 Transformation to more **efficient, inclusive, resilient and sustainable aquatic food systems** for **better production, better nutrition, a better environment, and a better life, leaving no one behind.**

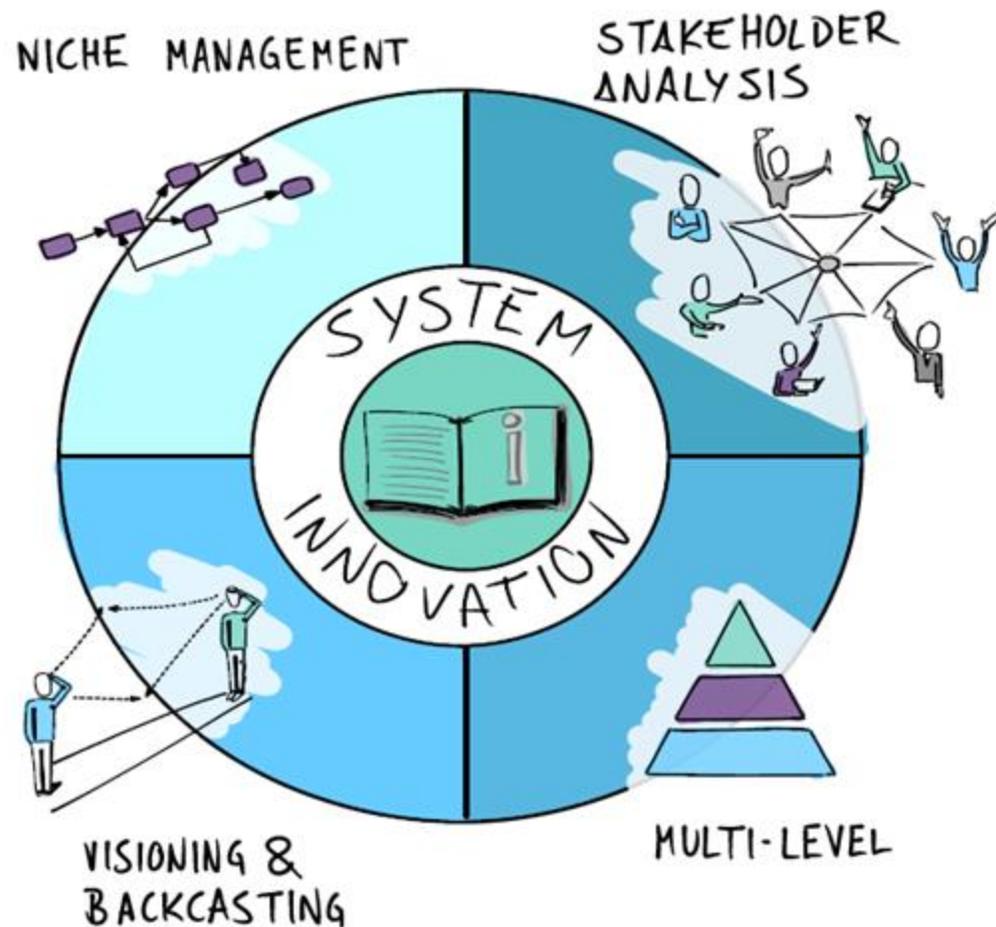
<https://openknowledge.fao.org/items/467191e5-111b-4191-a4d3-843e491fd418>



System Innovation Approach

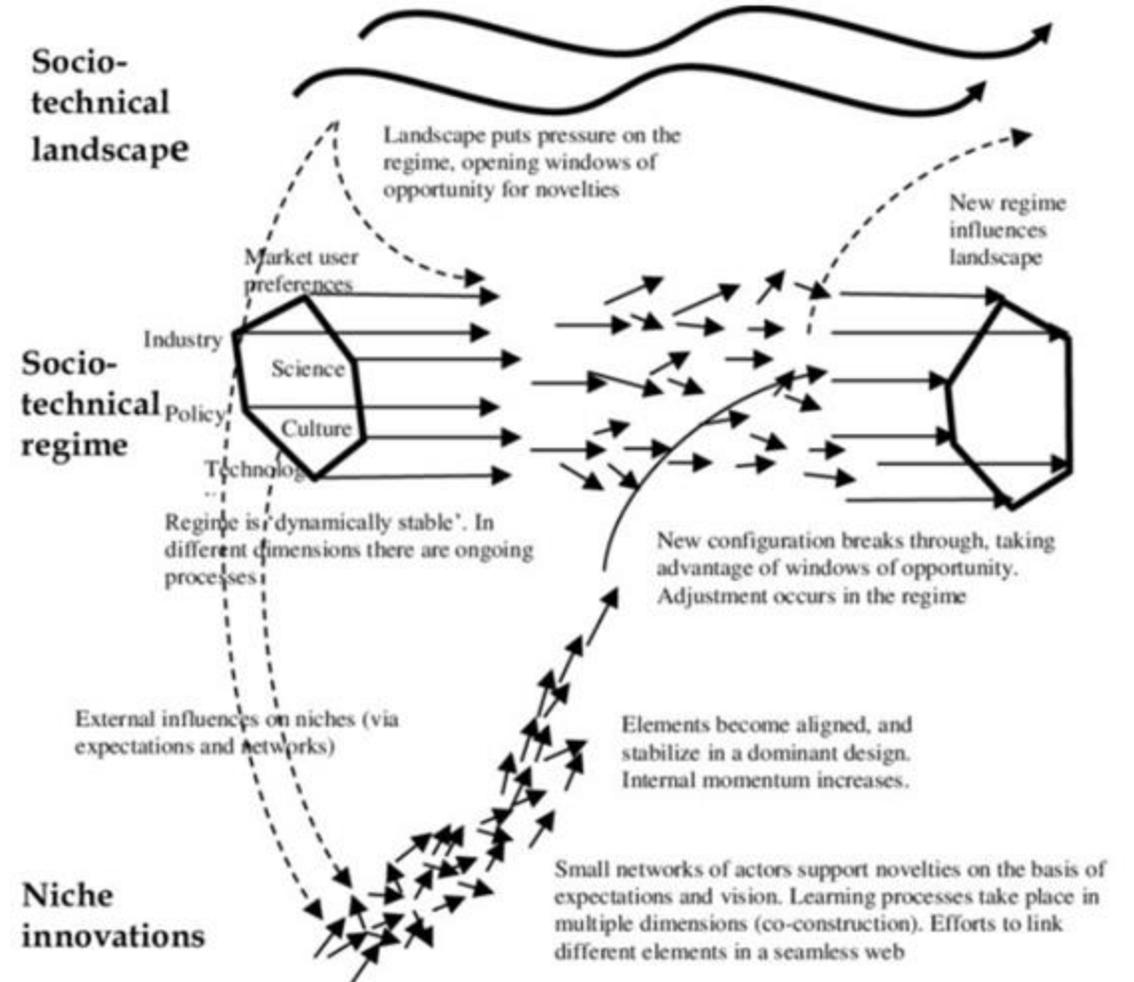
An approach towards **systemic change** based on interconnected set of innovations in order to **solve complex problems**: A portfolio of connected projects across technologies, governance, finance, social innovations.

The emphasis is on the functions of the **cross-sectoral system “as a whole”** and on the **variety of actors that are part of the system**, instead of just focusing on specific functions or individual/sectoral benefits.



Societal transitions are not random events, they emerge from a specific constellation of conditions that interact in complex ways.

Transitions come about when **landscape pressures** (e.g. population growth, technological change, climate change) result in a realization that existing **socio-technical regimes** (e.g. fossil fuel-based energy systems, mobility systems based on the private car, industrial fishing) **are inappropriate** to address potentially destructive pressures or achieve a set of broader sustainability goals that previously did not exist



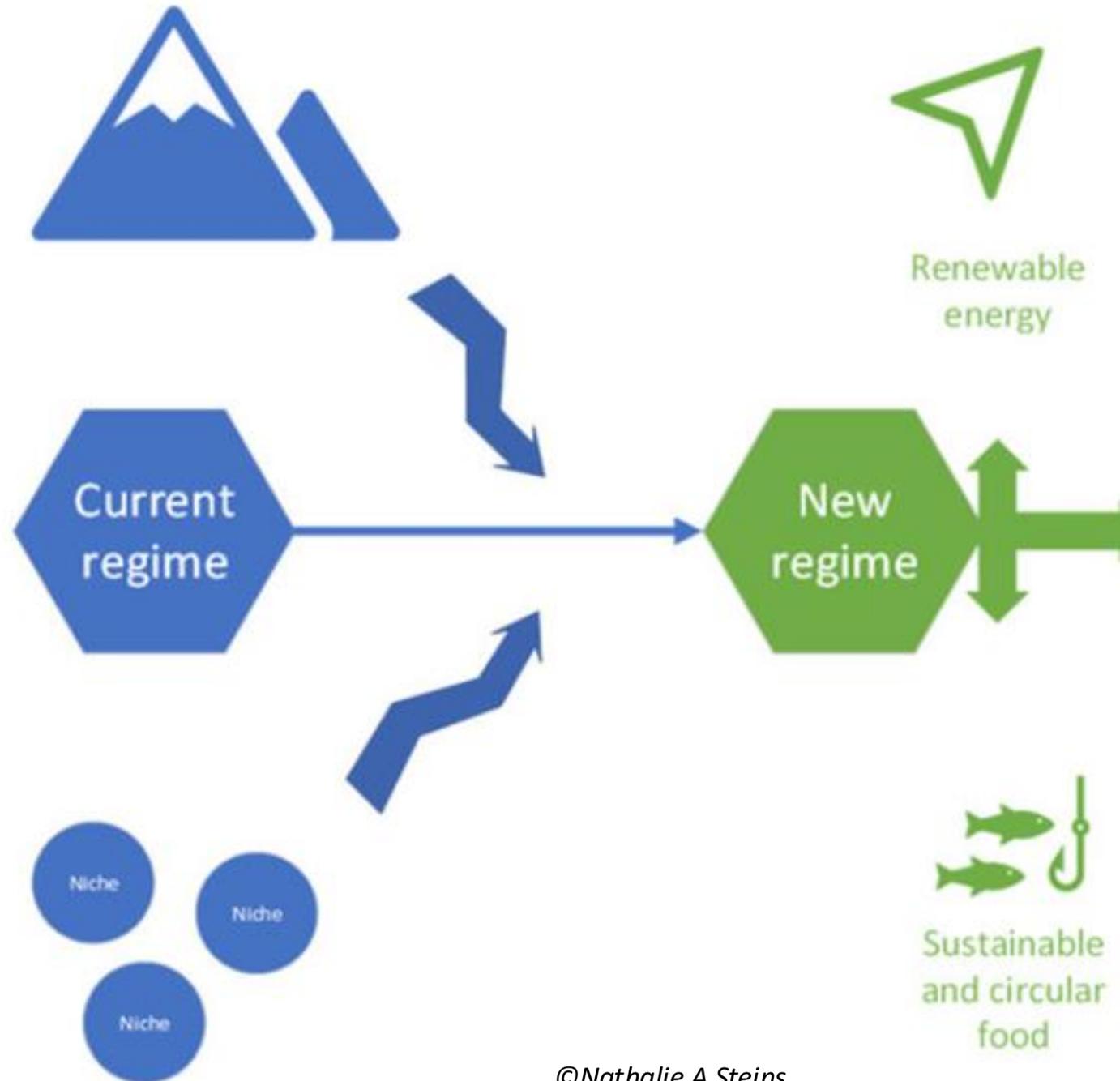
Multi-Level- Perspective: transitioning to a new Blue Economy regime

Energy system

From offshore mineral extraction to blue renewable offshore energies

Food system:

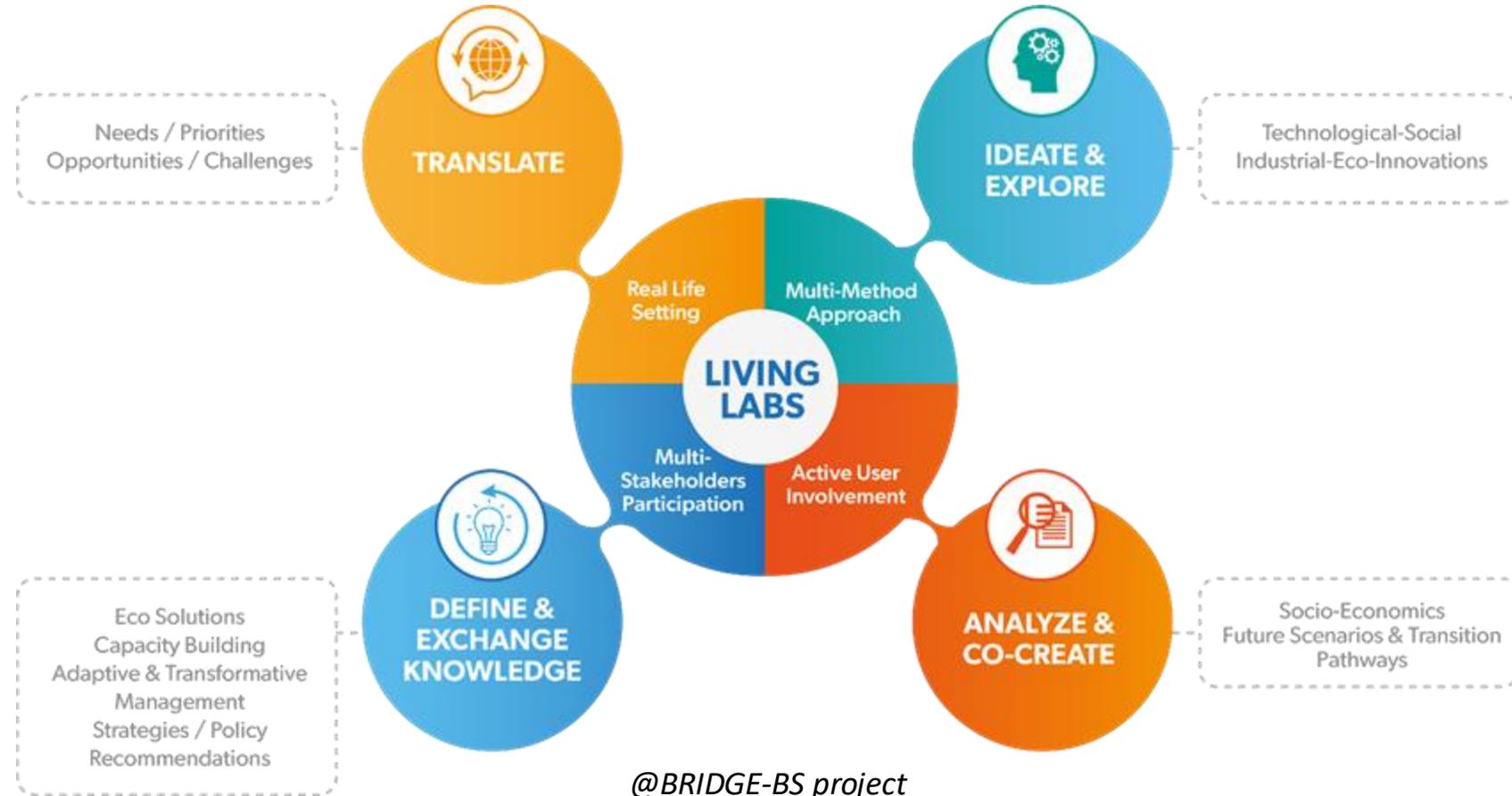
Transitioning to sustainable and circular fishery and aquaculture



Living Labs

Living labs are a participatory research tool often used in planning, product design and innovation

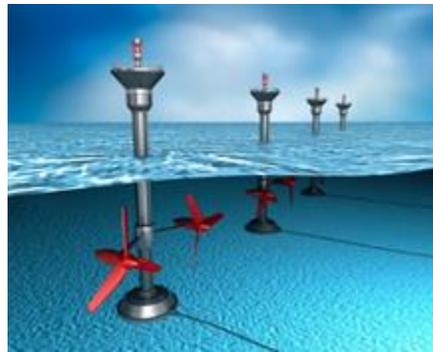
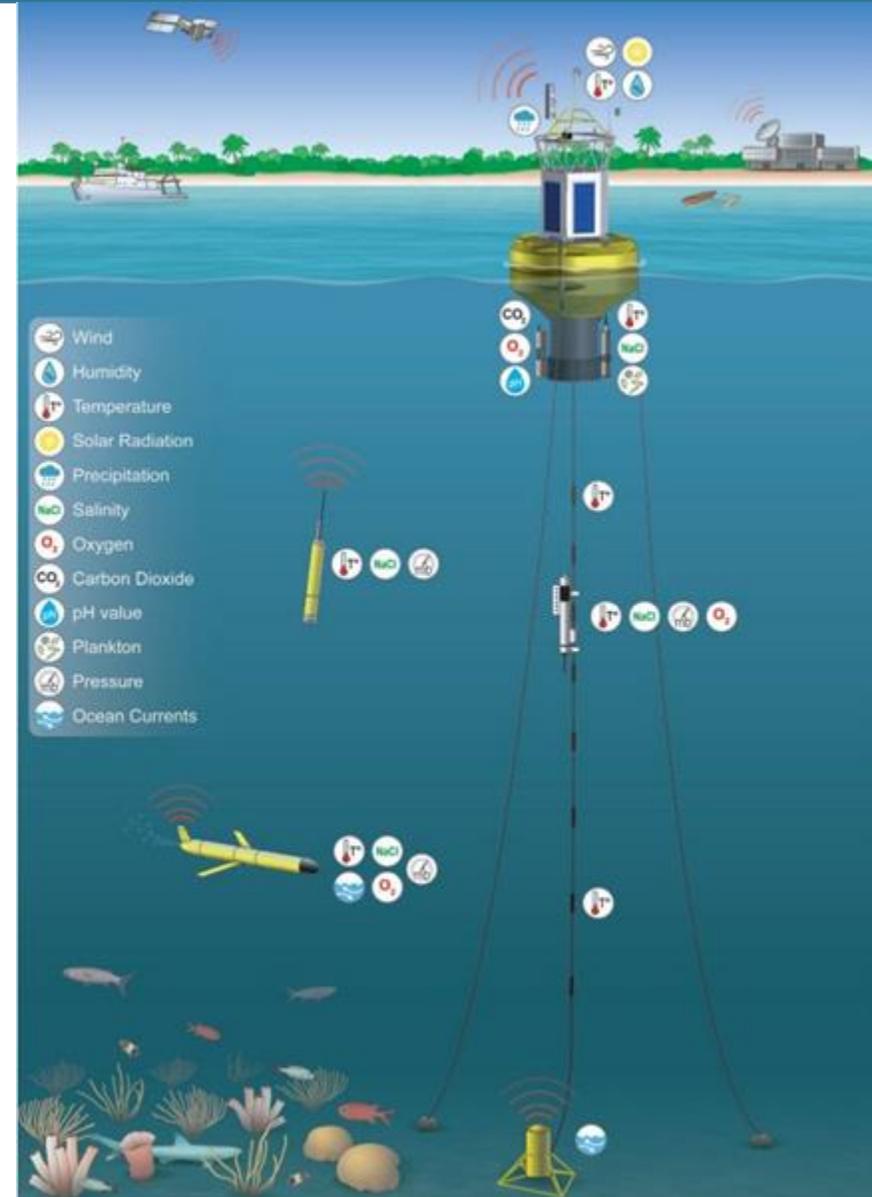
It brings together a collective of key stakeholders to explore a focal issue. LLs act as open innovation spaces which supports co-creation with users and the end-result is expected to better solve stakeholder needs.



1. Leminen, S., Westerlund, M., & Nyström, A. - G. 2012. Living Labs as Open-Innovation Networks. *Technology Innovation Management Review*, 2(9): 6-11.
2. Pascu, C. and van Lieshout, M. (2009), "User-led, citizen innovation at the interface of services", *info*, Vol. 11 No. 6, pp. 82-96.
3. Westerlund, M., & Leminen, S. 2011. Managing the Challenges of Becoming an Open Innovation Company: Experiences from Living Labs. *Technology Innovation Management Review*, 1(1): 19-25

Innovation as a key enabler to transformation?

Within the Blue Economy, from the conventional sectors to the fast-growing activities, sustainability is seen achievable **through innovative sustainable ocean solutions** (Pace et al., 2022), capable of reducing and mitigating anthropogenic impacts on the marine environment on one side, offering new **sustainable business opportunities** (e.g. in blue biotechnology or ocean energies)



SIA: SOCIAL INNOVATION AS A TRIGGER FOR CHANGE

"Social innovation is the process of designing, implementing, and institutionalizing novel social practices that address societal challenges and inequalities through collaborative governance to support systemic transformation. It enhances collective well-being by restructuring social relations, shifting cultural values, and empowering civil society while ensuring sustainable and scalable solutions."



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Fostering systemic change by enabling policy co-creation, institutional flexibility, and localized ownership of marine solutions—ultimately enhancing the scale, scope, and societal resonance of sustainable maritime development

(Soma et al., 2017; Howaldt & Kaletka, 2023).

Unlike traditional technological solutions that often overlook social dynamics, social innovation ensures that **economic and ecological transitions also embed equity, inclusion, and long-term resilience**

(Soma et al., 2017).



@FAO

SYSTEMS INNOVATION APPROACH - STEP BY STEP

1

Defining the scope: systems boundaries (spatial, temporal or conceptual), setting focus/objectives

2

Mapping: Mapping of the system including stakeholders, issues and challenges

3

Problem Definition: Challenge statement and problem isolation

4

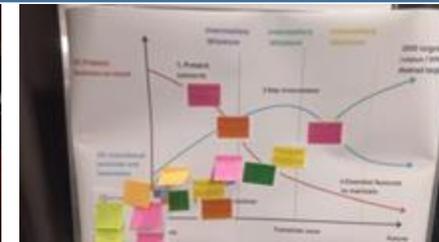
Envisioning: Outlining the desired future state/goal

5

Back casting: Identification of pathways working backwards from the Future Vision

6

Building: Elaboration of the pathways by identifying concrete actions



2022 → **+120** Stakeholders from the blue economy sectors were engaged in local Living Labs held in BRIDGE-BS Pilot Sites.

2023 → **+140**

2024 → **+150**

BRIDGE-BS LL stakeholders' engagement flow

WS1
Problem
scope

WS2
Envisioning a
sustainable future

WS3
Transformative
Pathway

Results and
legacy

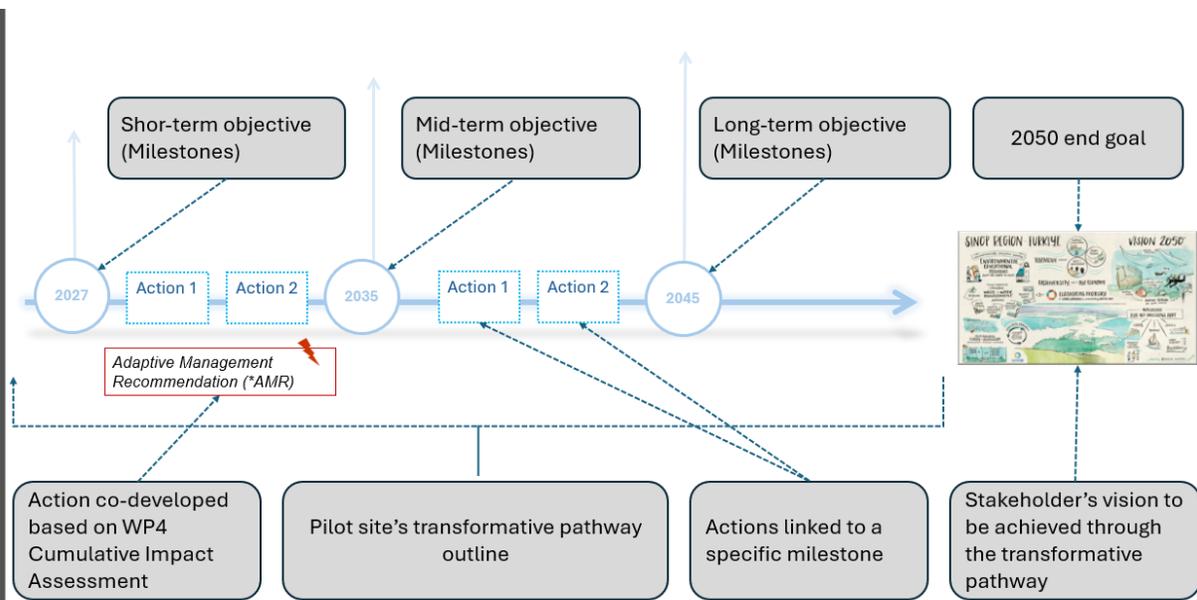


A roadmap of short, mid and long terms of actions (innovation, best practices, management measures)



PILOT SITES BLUE TRANSFORMATIVE PATHWAYS

- Pathways 'Key' - p2
- PS1: Bosphorus – Istanbul p.4
- PS2: Western Shelf (Varna & Burgas) p.81
- PS3: Western Black Sea (Danube Influence Area) p132
- PS3: Western Black Sea (Danube Influence Area) p132
- PS6: Eastern Black Sea (Batumi site) p176
- PS7: Southern Black Sea (Sinop Site) p208
- PS4: North Black Sea (Odesa) – War scenarios p249



Many blue economy sectors are operating in unsustainable manners with dramatic impacts on marine ecosystems calling for sustainability transformation

Sustainability transformation aims at shifting societal systems towards **long-term ecological balance, social equity, and economic prosperity**

SIA is a participatory, innovation centered approach to implement sustainable transformation

The BRIDGE-BS project **co-designed with Black Sea local communities, blue economy sector-based transformative pathways** for tourism, shipping, fishery, aquaculture, MRW and marine environmental management, providing a portfolio of short, mid, and long-terms concrete actions to support the sustainable development of the blue economy in the region

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- Supporting sustainability transitions under the european green deal with cohesion policy Toolkit for national and *regional decision-makers Regional and Urban Policy*. (n.d.). <https://doi.org/10.2776/581969>



THANK YOU!



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