

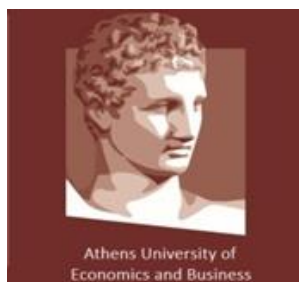
The Challenge of Implementing Sustainable Development: Integrating Socio-Economic Values in Interdisciplinary Approaches

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Professor and Director of ReSEES Laboratory, School of Economics
ATHENS UNIVERSITY OF ECONOMIC AND BUSINESS (www.aueb.gr)

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Director Climate KIC Greece, ATHENA Research & Innovation Center (www.athena-innovation.gr/en)

Co-Chair, UN SDSN: UN Sustainable Development Solutions Network - Greece (www.unsdsn.gr)
Chair ICRE8: International Center for Research on the Environment and the Economy (www.icre8.eu)
Vice-Chair, European Forest Institute (www.efi.int)





Sustainable Development:

organizing principle for meeting human development goals

while

sustaining the ability of natural systems to provide the natural resources and ecosystem services

upon which

the economy and society depend.

Sustainable development: meets the needs of the present without compromising the ability of future generations to do the same.



A global network of universities, research and innovation centres, civil society organizations, businesses, policymaking and political institutions, to support the science driven implementation of the Sustainable Development Goals (SDGs)

What is the United Nations Sustainable Development Solutions Network – UN SDSN?

- SDSN was launched in 2012 by UN Secretary General Ban-Ki Moon
- In order to mobilize global scientific and technological expertise
- To promote practical problem solving for sustainable development



SDSN-Global, Earth Institute,
Columbia University
SDSN-Global Director, Prof.
Jeffrey Sachs



Sept. 7 - 8, 2017 | Athens, Greece

3rd SDSN Mediterranean Conference & Official Launch of



Co-Chairs:

Prof. Phoebe Koundouri

Prof. Andreas Papandreou

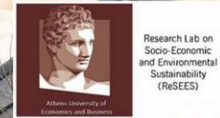
Keynote Speaker: Prof. Jeffrey D. Sachs



Co-Hosting Institutions

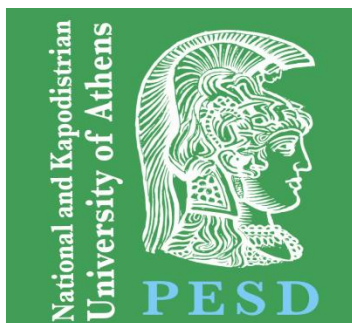


Partners



International Centre for
Research on the Environment
and the Economy (ICRE8)

www.icre8.eu



University of Athens
Political Economy of Sustainable
Development Lab (PESD)

<http://pesd.econ.uoa.gr>

Website: www.unsdsn.gr

Co-Chairs

Prof. Phoebe Koundouri

Prof. Andreas Papandreou

Leadership Council

Business, Politicians, NGOs, Policy
Making

Youth Section



SDSN Greece Cross-Cutting Themes & Thematic Priorities



Self-destructing
Rotations

Sustainable
Rotations

CROSS-CUTTING THEMES

Natural Capital Valuation:
Sustainable Investment Allocation

Climate Change: Mitigation and
Adaptation Policies

Sustainable Development in Times of
Crisis

THEMATIC PRIORITIES

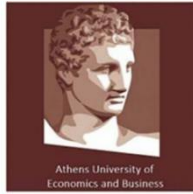
Sustainable Shipping and Marine
Resources Management

Sustainable Energy and Energy Security

Sustainable Water-Food-Energy Nexus

Sustainable Tourism and Biodiversity

Education and Training Courses in
Sustainable Development



Research Lab on
Socio-Economic
and Environmental
Sustainability
(ReSEES)



Hosting Institutions

Cluster of research entities:

- ***SDSN-Greece: United Nations Sustainable Development Solutions Network***
- ***ICRE8, private not for profit Research Center***
- ***PESD/NKUA: National and Kapodistrian University of Athens, Political Economy of Sustainable Development Laboratory***
- ***ReSEES/AUEB: Athens University of Economics and Business, Research on Socio-Economic and Environmental Sustainability (ReSEES) Laboratory***
- ***Climate KIC Greece/ATHENA, government Research Center***

with a strong commitment to research related to Economics, Environment, Energy, (Eco-)Innovation and Sustainability, with an exceptional record in attracting research funding, achieving successful completion of influential projects with explicit policy interventions, and producing numerous academic and popular publications.

SDSN GREECE Map Projects



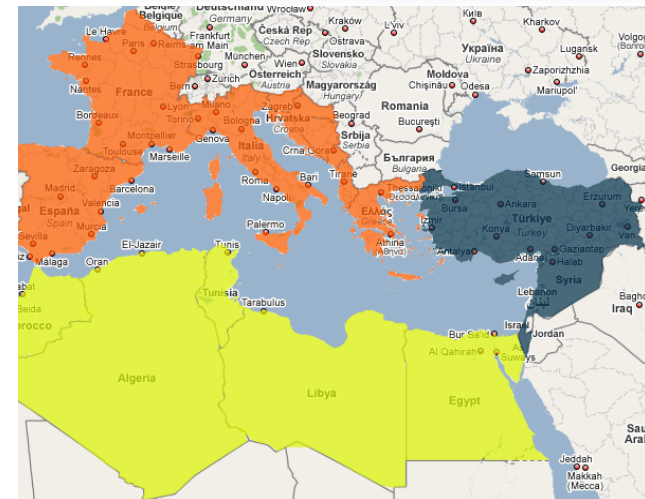
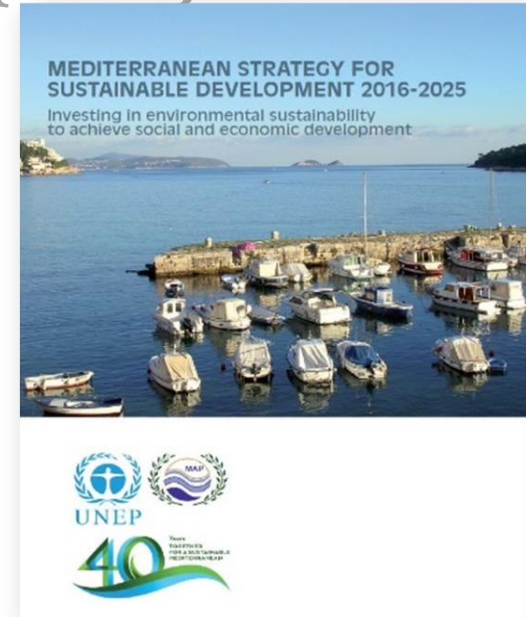
•€100+ million of research funding from: European Commission: DG RTD (FP4,5,6,7, H2020), DG MARE, DG ENV, DG ENER, International Organizations: World Bank, OECD, EBRD, WHO, FAO, UN, Governments in all 5 continents

•1000+ peer-reviewed research papers & books

Contextualizing the SDGs for the Mediterranean Region: MED Strategy for Sustainable Development (MSSD)

Regional priorities for the Mediterranean:
How do they translate to SDGs?

1. Ensuring sustainable development in marine and coastal areas
2. Promoting resource management, food production and food security through sustainable forms of rural development
3. Planning and managing sustainable Mediterranean cities
4. Addressing climate change as a priority issue for the Mediterranean
5. Transition towards a green and blue economy
6. Improving governance in support of sustainable development





Where do the Mediterranean countries stand relative to the SDGs?

Country	2017 Global SDG Index Score	Country	2017 Global SDG Index Score
Czech Republic	81.9	Cyprus	70.6
Slovenia	80.5	Israel	70.1
France	80.3	Albania	68.9
Hungary	78.0	Russia	68.9
Belarus	77.1	Algeria	68.8
Croatia	76.9	Tunisia	68.7
Slovakia	76.9	Turkey	68.5
Spain	76.8	Montenegro	67.3
Poland	75.8	Morocco	66.7
Italy	75.5	Jordan	66.0
Moldova	74.2	Bosnia & Herzegovina	65.5
Romania	74.1	Lebanon	64.9
Greece	72.9	Egypt	64.9
Ukraine	72.7	Syria	58.1
Bulgaria	72.5	Iraq	56.6

European – Mediterranean Countries 2017 SDG Index Score

Country	Global Index Score	1 NO POVERTY	2 ZERO HUNGER	3 GOOD HEALTH AND WELL-BEING	4 QUALITY EDUCATION	5 GENDER EQUALITY	6 CLEAN WATER AND SANITATION	7 AFFORDABLE AND CLEAN ENERGY	8 DECENT WORK AND ECONOMIC GROWTH	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	10 REDUCED INEQUALITIES	11 SUSTAINABLE CITIES AND COMMUNITIES	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	13 CLIMATE ACTION	14 LIFE BELOW WATER	15 LIFE ON LAND	16 PEACE AND JUSTICE STRONG INSTITUTIONS	17 PARTNERSHIPS FOR THE GOALS
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Slovenia	80.5	Green	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Yellow	Red	Red	Red	Yellow	Yellow	Yellow
France	80.3	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red	Yellow	Yellow	Yellow
Croatia	76.9	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Spain	76.8	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red	Yellow	Yellow	Red	Red	Red	Red	Yellow	Yellow
Italy	75.5	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red	Yellow	Yellow	Red	Red	Red	Yellow	Red	Yellow
Greece	72.9	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Red	Yellow	Yellow	Red	Red	Red	Yellow	Yellow	Yellow
Cyprus	70.6	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Red	Red	Red	Green	Yellow	Red
Albania	68.9	Green	Red	Red	Yellow	Yellow	Yellow	Yellow	Red	Red	Green	Yellow	Yellow	Yellow	Red	Yellow	Red	Yellow
Turkey	68.5	Yellow	Red	Yellow	Yellow	Red	Yellow	Yellow	Red	Red	Red	Yellow	Yellow	Yellow	Red	Red	Yellow	Yellow
Montenegro	67.3	Green	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Red	Yellow	Red	Red	Yellow	Green

AVERAGE Global Index Score for European Mediterranean Countries: 73.1

Central Concept:



Achieving **Natural Resources, Economic, Social Sustainability** by developing **scientific and methodologically sound approaches** to recognizing, demonstrating and capturing the **Total Economic Value** of natural resources and other public goods (important for social welfare), integrating them in sustainable management plans **and developing instruments and policy making to stimulate sustainable behavior**, while recognizing the **interdisciplinary** nature of the challenge.

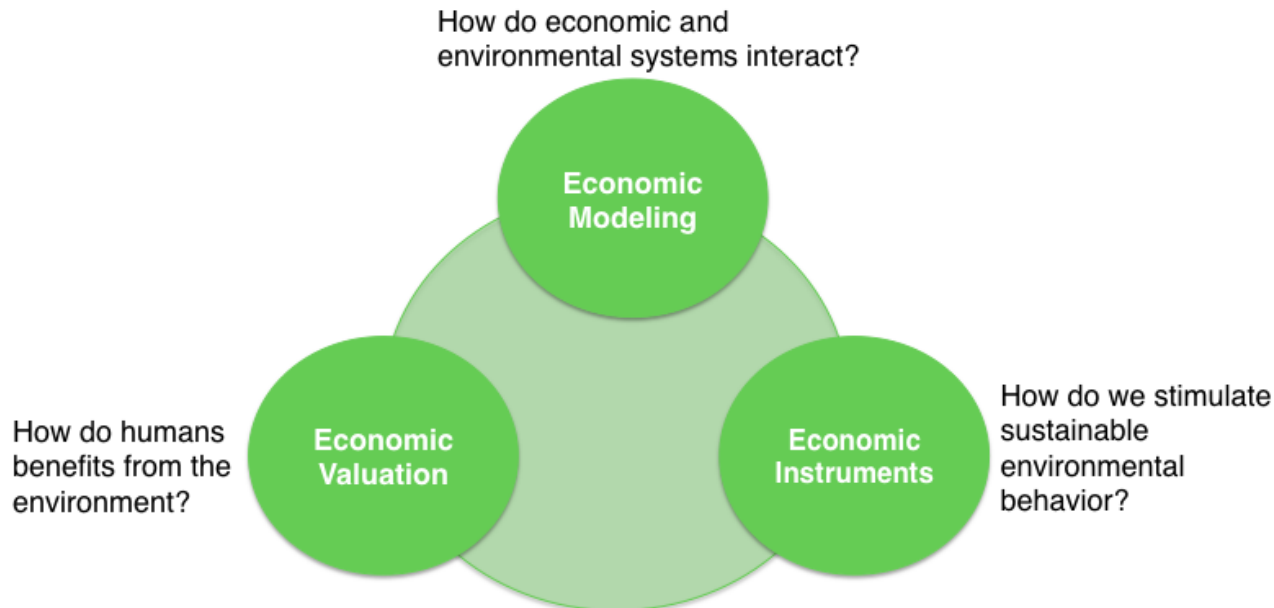
AN INTRODUCTION TO THE NON- EXPERT

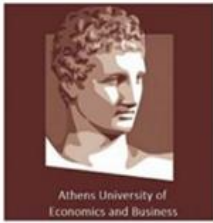
Economics?

Allocation of scarce resources across people, over time & space in a way that social welfare is maximized.



Natural Resources, Environmental and Energy Economics?





Research Lab on
Socio-Economic
and Environmental
Sustainability
(ReSEES)



Stages of Interdisciplinary Analysis

MODELS ON INTERACTION

- Nature
- Society
- Economy
- Including CC & SE scenarios



EMPIRICAL APPLICATION of MODELS, FUTURE SIMULATION

- Quantitative & Qualitative Results
- Decision Criteria (CBA, etc.)
- Management Plans and Policy Recommendations



CHARACTERIZATION

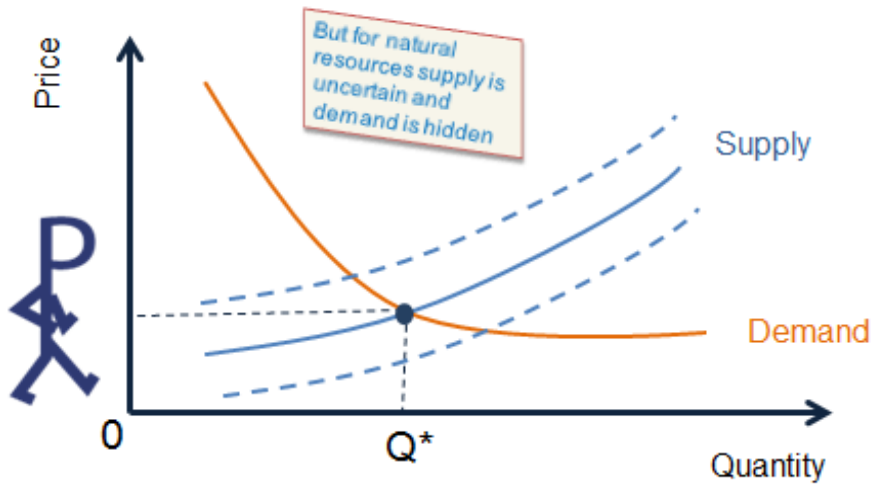
- Natural Resources,
- Socio-Economic
- Institutional
- Stakeholders



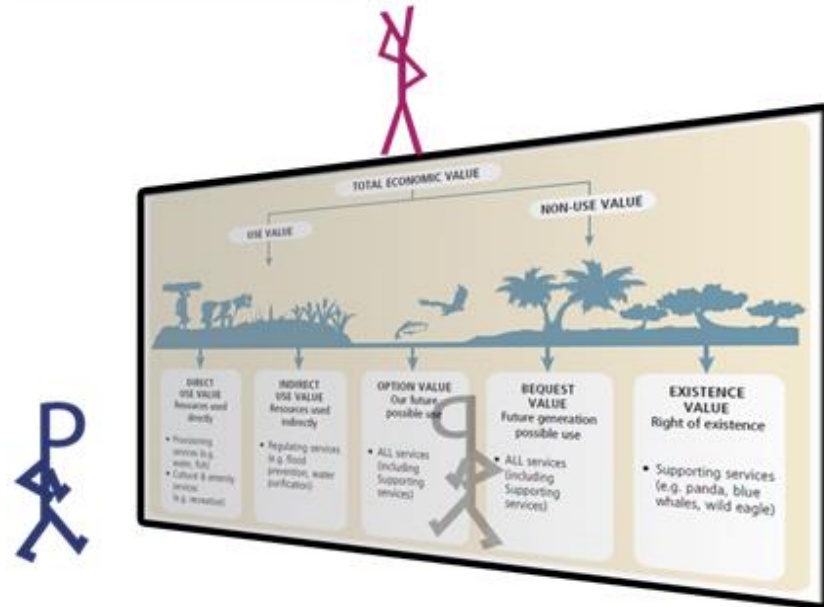
SOLUTIONS & INNOVATION / Stakeholders Adoption and Diffusion

- Socio-Economic Instruments
- Infrastructural Investments
- Nature-Based Solutions
- Technological Innovation
- Social Innovation

Market Interaction Makes Value Explicit

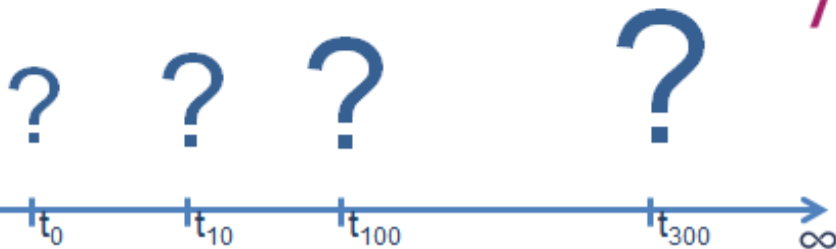


Price should mirror Value



We need  for EACH

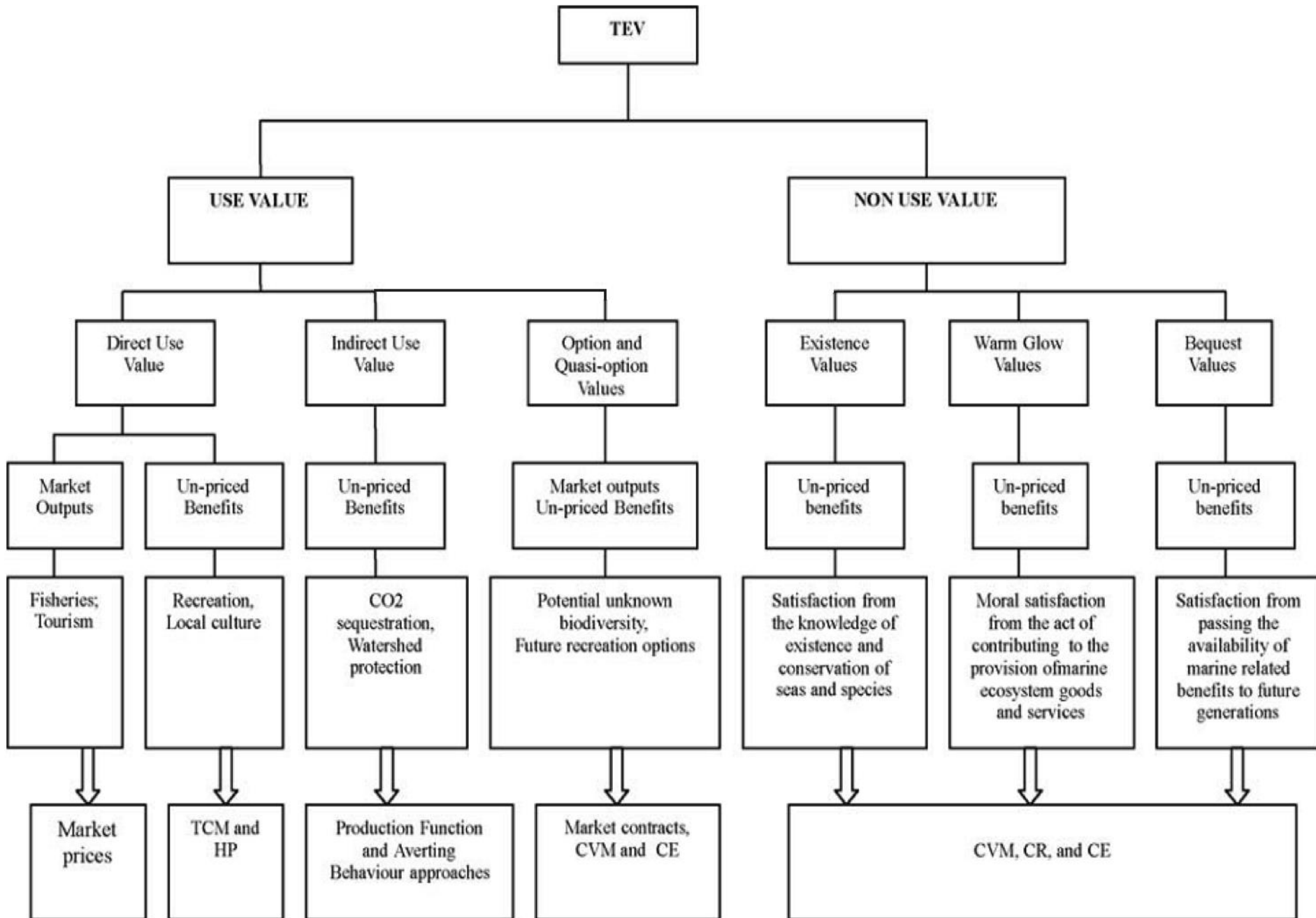
- Resource _(r)
- Individual _(i)
- Space _(s)
- Time _(t) from today till ∞

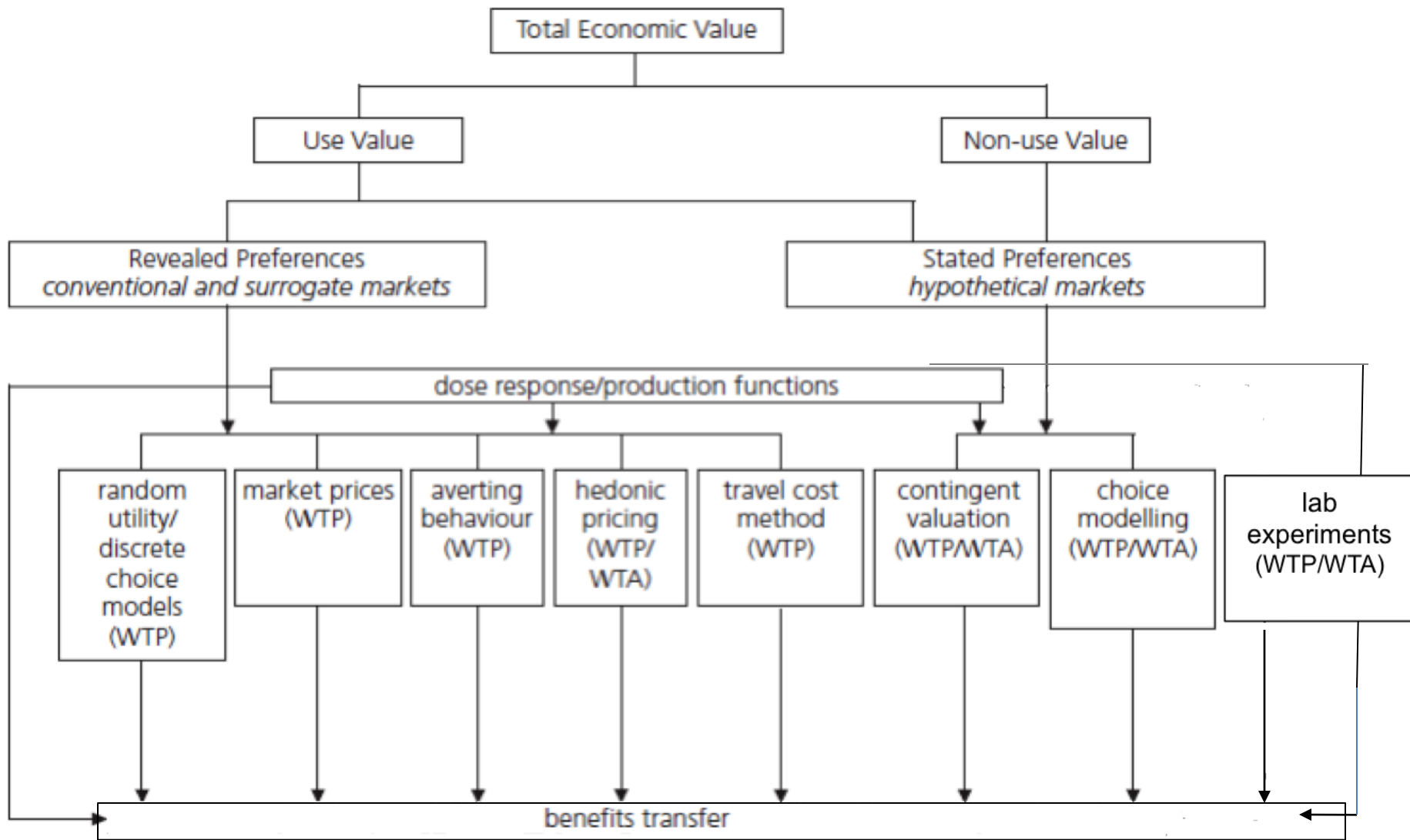


If you can't
measure it,
you can't
improve it

(William Thomson, Lord Kelvin)

TEV Example: Marine Resources

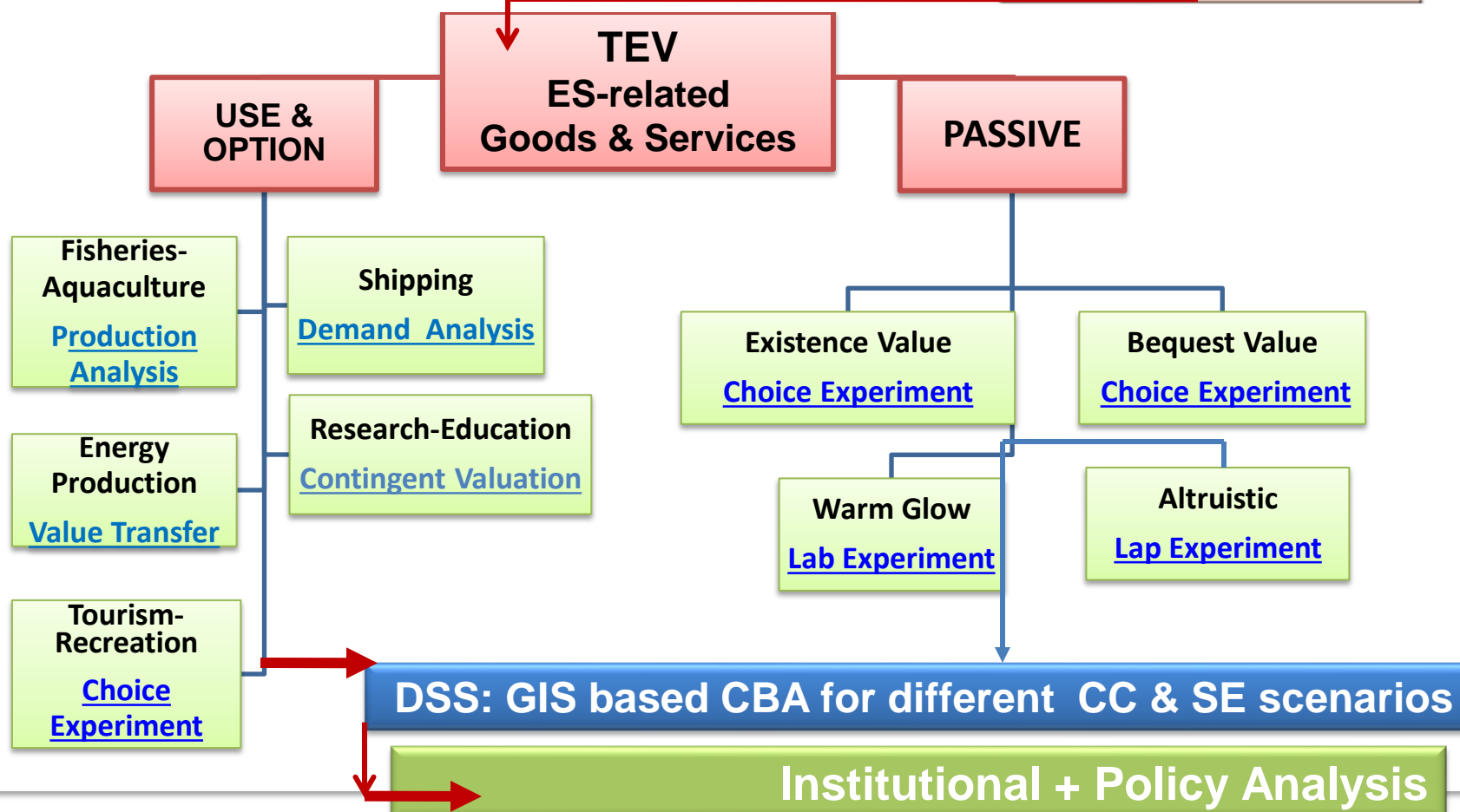
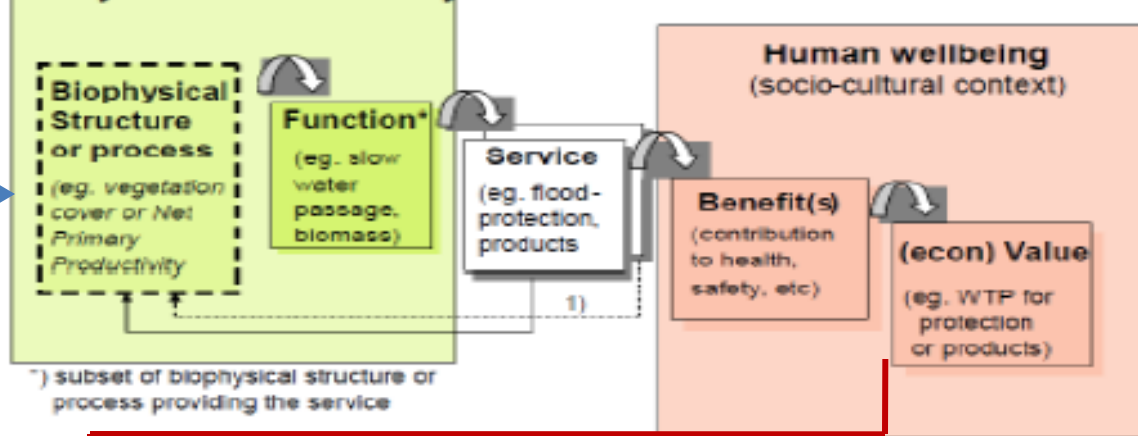




- TEV: systematic tool for considering full range of impacts on human welfare.
- TEV: reflects the preferences of individuals.
- Preferences can be studied and estimated by stated & revealed preference methods .
- TEV: essential for resource allocation and policy making.



Ecosystems & Biodiversity



Methods to elicit Economic Value of non-market Goods & Services

Mathematical Modeling

$$y_j = f(x_j^1, x_j^2, A_j)$$

$$\max_{x_1, x_2, T} V_{1,2,T}^* = V_{1,2,T}^*(x_1, x_2, T)$$

$$V_{1,2,T}^* = \sum_{t=0}^T \frac{1}{(1+r)^t} [U(x_1^t, x_2^t) - \lambda_1^t (x_1^t - x_1^{t-1}) - \lambda_2^t (x_2^t - x_2^{t-1}) - \mu^t (T - (x_1^t + x_2^t) + (1-\delta)(x_1^{t-1} + x_2^{t-1}))]$$

$$\frac{\partial V_{1,2,T}^*}{\partial x_1^t} = U_{x_1}^t - \lambda_1^t + \lambda_2^t - \mu^t = 0$$

$$\frac{\partial V_{1,2,T}^*}{\partial x_2^t} = U_{x_2}^t - \lambda_2^t + \lambda_1^t - \mu^t = 0$$

$$\frac{\partial V_{1,2,T}^*}{\partial T} = \frac{1}{(1+r)^T} [U(x_1^T, x_2^T) - \lambda_1^T x_1^T - \lambda_2^T x_2^T] - \mu^T = 0$$

Econometric Modeling

$$x_1 = 2.341 + 0.657 p_{0x} - 0.321 w_{1x}$$

$$- 0.107 w_{2x} - 0.026 w_{3x}$$

$$- 0.024 w_{4x} + 0.412 I_k + \epsilon$$

$$\ln(\lambda_1, \lambda_2, \mu, \beta) = \ln^{(1)}(\lambda_0)^{\beta}$$

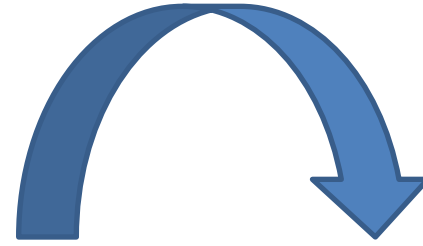
$$h_{\lambda_1}(\lambda_1, \lambda_2, \mu, \beta) = -h_{\lambda_2}(\lambda_1, \lambda_2, \mu, \beta) \frac{\partial(\lambda_1, \lambda_2)}{\partial \lambda_1}$$

$$h_{\lambda_2}(\lambda_1, \lambda_2, \mu, \beta) = -h_{\lambda_1}(\lambda_1, \lambda_2, \mu, \beta) \frac{\partial(\lambda_1, \lambda_2)}{\partial \lambda_2}$$

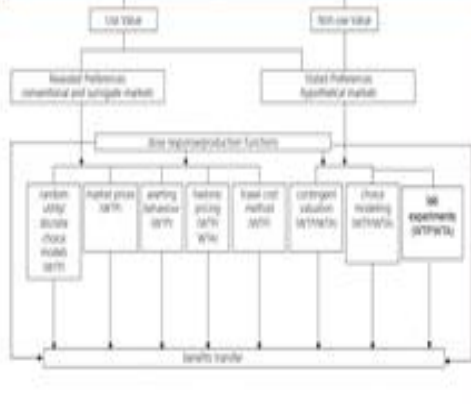
$$h_{\mu}(\lambda_1, \lambda_2, \mu, \beta) = -h_{\lambda_1}(\lambda_1, \lambda_2, \mu, \beta) \frac{\partial(\lambda_1, \lambda_2)}{\partial \mu}$$

$$h_{\beta}(\lambda_1, \lambda_2, \mu, \beta) = -h_{\lambda_1}(\lambda_1, \lambda_2, \mu, \beta) \frac{\partial(\lambda_1, \lambda_2)}{\partial \beta}$$

$$E(\lambda_1) = \left(\frac{1}{\lambda_0}\right)^{\beta} \Gamma\left(1 + \frac{1}{\beta}\right)$$



Valuation Methods

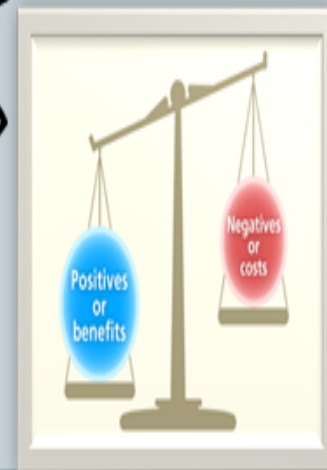
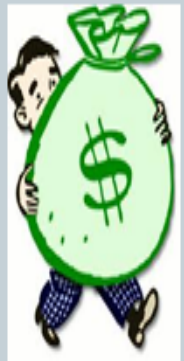


Survey

Choice card example Tourists (12 in total)

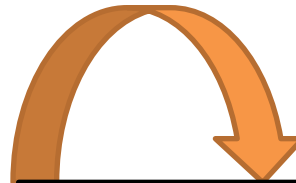
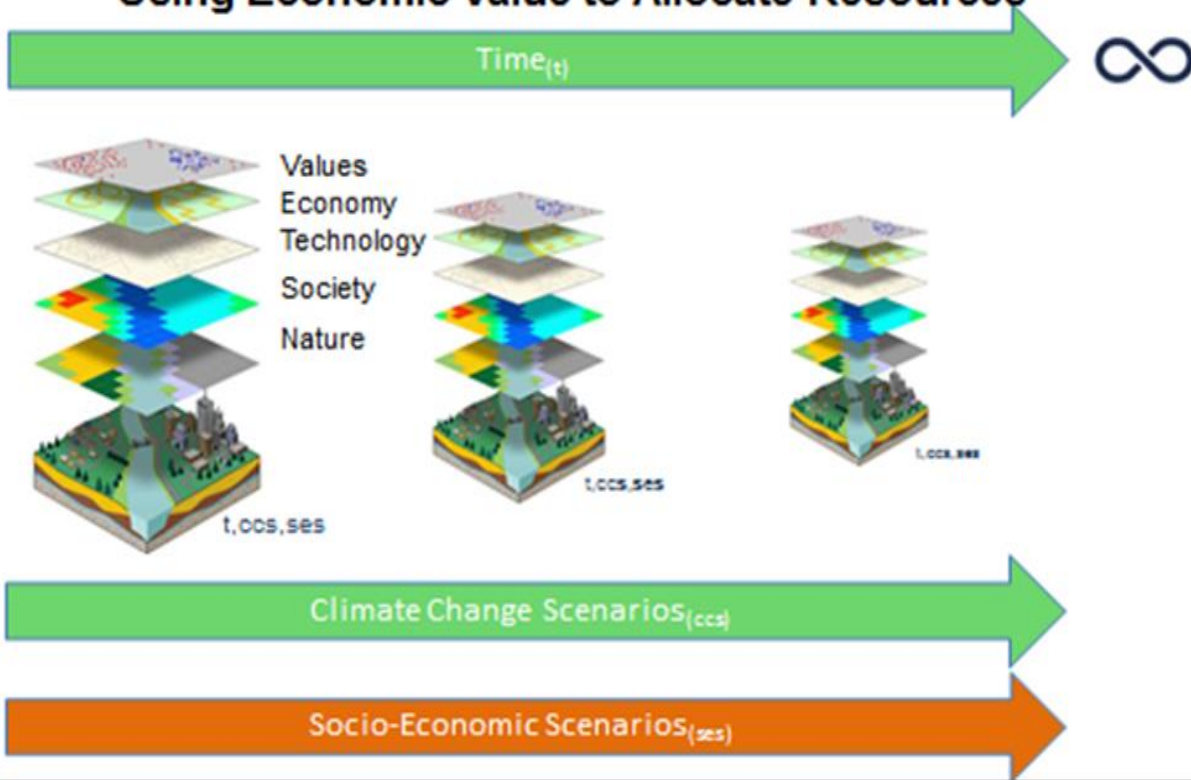
	Design 1	Design 2	Design 3
Choice card 6			
Environmental status			
Extent of vegetation as measured by satellite	Optimal (optimal) of environmental benefits	Intermediate (intermediate) of environmental benefits	Optimal (optimal) of environmental benefits
Recreational benefits and services	Good and excellent	Good and excellent	Good and excellent
Daily fee	NT\$ 80 (US\$ 2.6)	NT\$ 100 (US\$ 3.3)	0

Choose Optimal Allocation of Resources:
DSS: GIS based CBA under CC and SE Scenarios



Implementing Social Welfare Increasing Sustainable Solutions

Deriving Sustainable Development Plans Using Economic Value to Allocate Resources



**Nature Based
Solutions**

**Infrastructural
Solutions**

Socio-Economic Tools

Pricing
Tradable permits
Quotas
Taxes/subsidies
Charges
Direct Controls
Educational/Awareness
Campaigns
Voluntary Agreements
Legal Instruments
Investments



Research Lab on
Socio-Economic
and Environmental
Sustainability
(ReSEES)



Our Books



www.icre8.eu

1) Natural Capital Valuation: Sustainable Investment Allocation



Indicative Projects



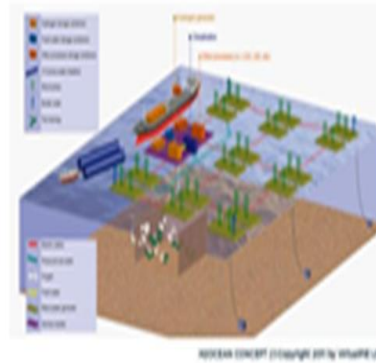


Innovative Multi-purpose offshore platforms: planning, design & operation



Development of a wind-wave power open-seas platform equipped for hydrogen generation with support for multiple users of energy

<http://www.h2ocean-project.eu/>



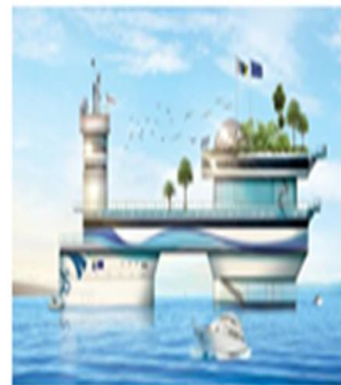
Innovative multi-purpose offshore platforms: planning, design and operation

<http://www.mermaidproject.eu/>



Modular multi-use deep water offshore platform harnessing and servicing Mediterranean, subtropical and tropical marine resources

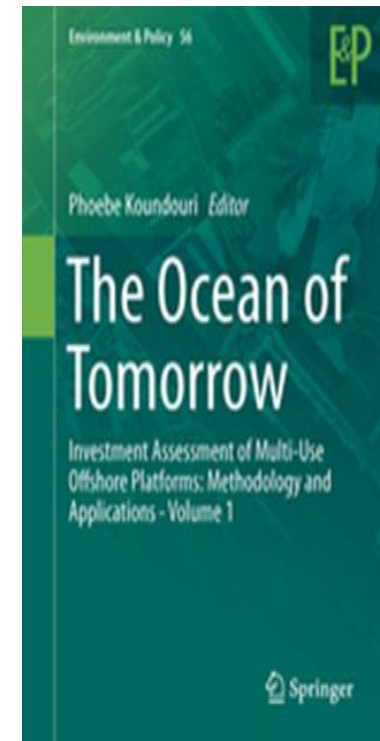
<http://www.troposplatform.eu/>



MERMAID ASSESSMENT TOOL
Decision making process for the Socio Economic Assessment of MUOP on different Mermaid Sites

- Web based analytics platform
- Open Source Technologies
- Can take advantage of cloud based technologies
- Formalized language that enables correct workflow from data collection to results production and interpretation
- Automated assessment
- Capability of producing alternative scenario with / without Socio - Economic Externalities
- Technical & Legal Feasibility assessment / Environmental Impact Assessment interactive questionnaires

PHOEBE KOUNDOURI - CRETE, AJUED, L. LIE
TAINIS KAHNIOU, EYDOUKA MALLI - MAGGIK HANI, USA, ATHENA, GR





The BlueBRIDGE Project – Addressing the Blue Societal Challenge EC DG Research & Innovation H2020. Budget: 10,000,000 euro

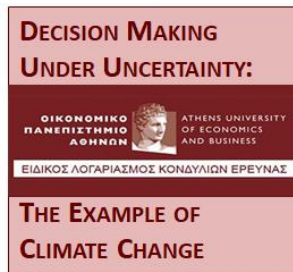
Building Research environments fostering Innovation, Decision Making,
Governance and Education to support Blue Growth

<i>Supporting assessment of stocks and fisheries</i>	<i>Improving performance and sustainability in aquaculture</i>	<i>Monitoring fisheries & habitat degradation</i>
A diagram illustrating the marine food web. It is divided into three horizontal layers: "Secondary consumers" at the top with large fish, "Primary consumers" in the middle with smaller fish, and "Primary producers" at the bottom with seaweed and small organisms.	An aerial photograph of a large-scale aquaculture operation. Numerous circular and rectangular cages are suspended in the water, with a service boat visible in the foreground.	An underwater photograph of a vibrant coral reef. The scene is filled with various types of coral, including branching and table corals, in shades of orange, red, and white.

2) Climate Change: Mitigation and Adaptation Policies



Indicative Projects





EIT Climate KIC Hub Greece



Associate Support



Government Support

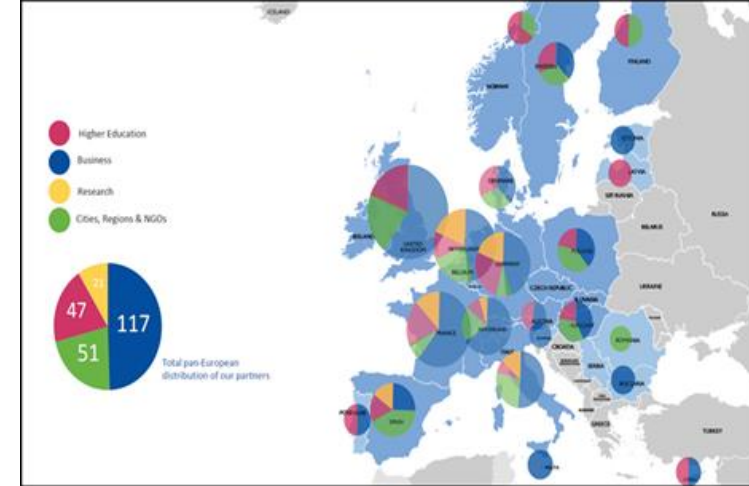


**HELLENIC REPUBLIC
MINISTRY OF ENVIRONMENT AND ENERGY
GREEN FUND**



CLIMATE KIC: The European Platform For Climate Innovation

EIT Climate KIC Hub Greece



- Will mobilize global and national scientific and technological expertise, to accelerate the transition to zero carbon economy, through CleanTech Innovation and Entrepreneurship.
- Via reinforcement of the collaboration between
 - Research & Education
 - Business, Financial Institutions & Private Funds
 - Civil Society, Policy Making and Politics
- **Overarching Goal:** To accelerate Innovation of Technology and of Integrated Approaches that will address the interconnected **economic, social, and environmental challenges** confronting the climate problem.



How?

1

Convening networks of expertise

Partners from business, academia, and the public and non-profit sectors, to create networks of expertise, through which innovative products, services and systems can be developed, brought to market and scaled-up for impact.

2

Leveraging Grants Smartly & Effectively

Identify and place public and private funds that stimulate innovation. Funding partners can effectively invest their resources for maximum impact.

3

Developing People & Capacity

Education programs (including online) for students, postgraduates and professionals., to develop skills and capacities, empowering them with up-to-date knowledge and best practice, and most of all Inspire them!.

4

Catalysing Innovation

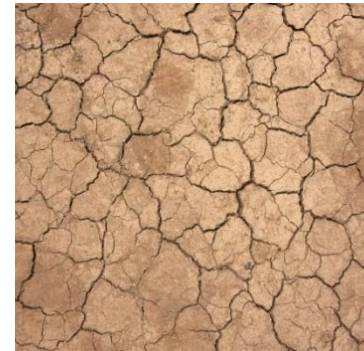
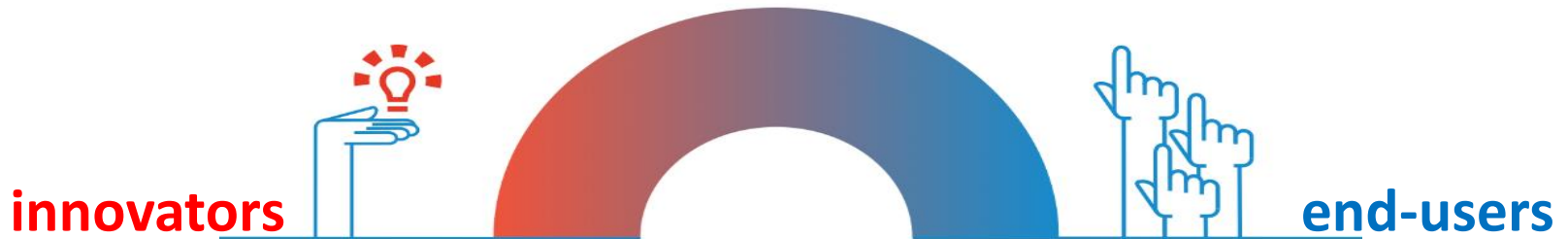
Catalyze and nurture innovation, from large corporations, research institutes and public bodies, through to start-ups and individual entrepreneurs.



BRIGAIID: BRIDging the GAP for Innovations
in Disaster resilience <http://brigaid.eu/>
EC DG Research & Innovation H2020
Budget: 9 000 000 euro



Aim: To effectively bridge the gap between **innovators** and end-users in resilience to floods, droughts and extreme weather



Synergies with ongoing EU Projects funding instruments

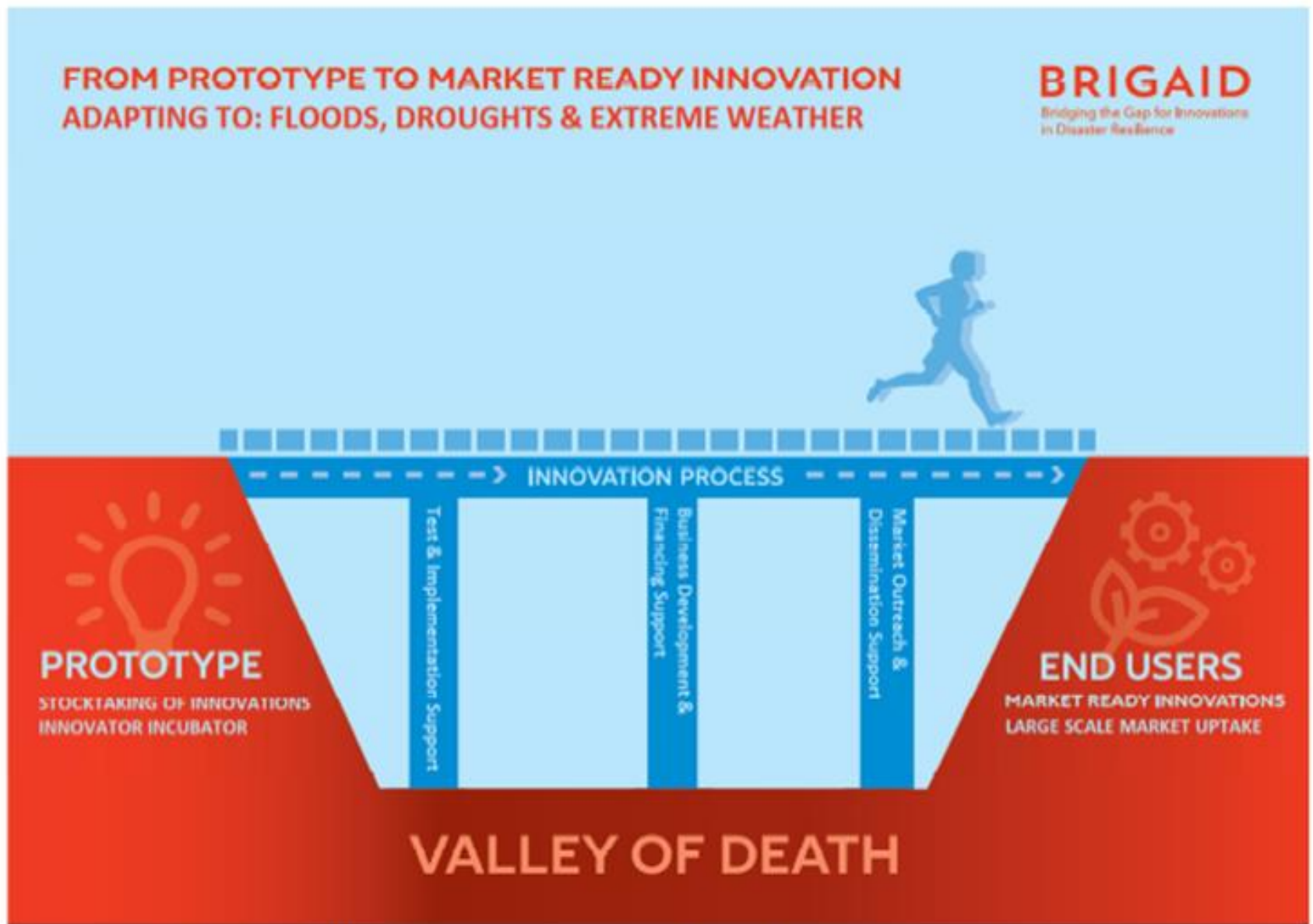


Figure 1.1: BRIGAIID's conceptual approach with three types support for innovations

3) Sustainable Development in Times of Crisis



Indicative Projects



DAFNE

aqua
librium





- 4-year project (2016-20)
- 26 partners
- Funded by the European Union (Horizon 2020)
- € 5,9m

- Advance understanding of social innovation and innovative governance in:
 - Agriculture
 - Forestry
 - Rural Development

- Boost them in marginalized rural areas across Europe and around the Mediterranean, including non-EU countries

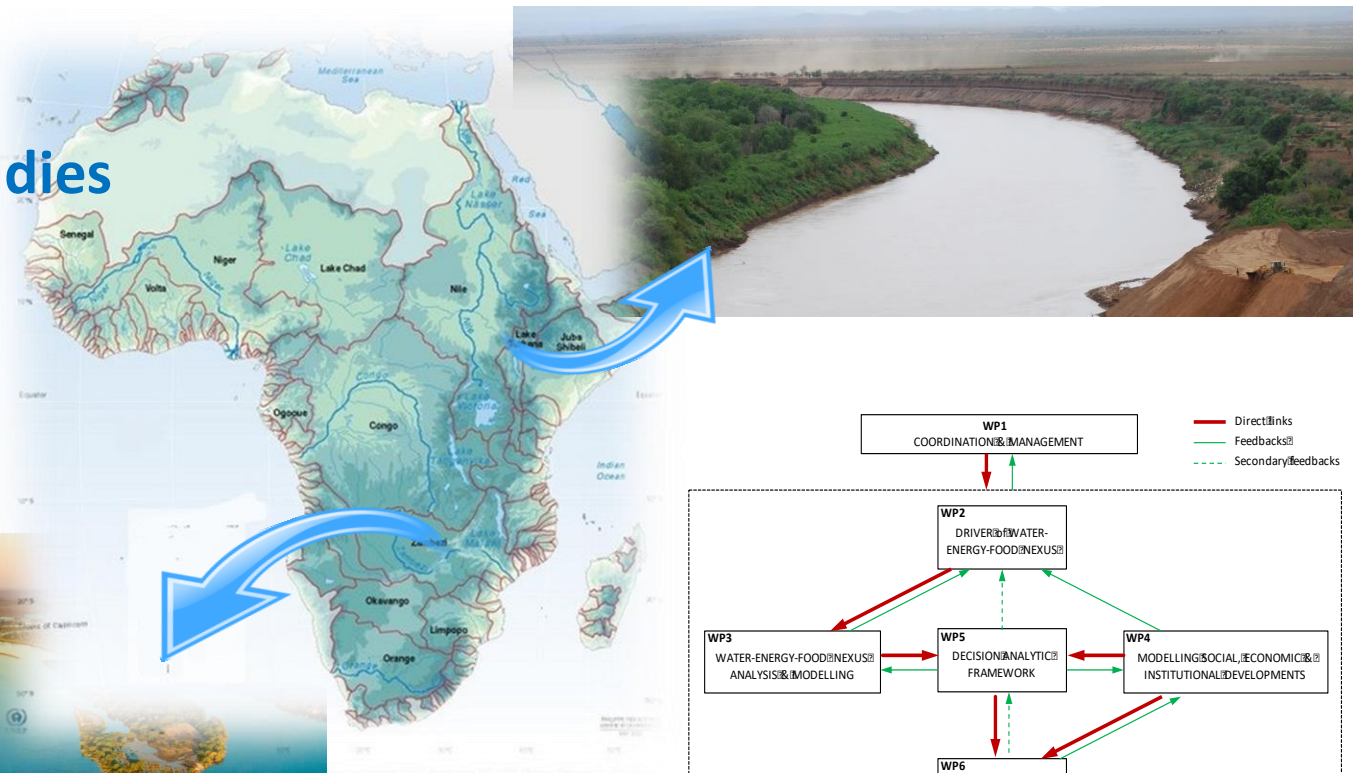


Sustainable Governance and Decision Support Systems

Aim: To establish a Decision-Analytic Framework for Participatory and Integrated Planning

Omo River Basin

2 Case Studies



Zambezi River Basin



Innovations and Management for Sustainable Development

The Value of Distant Benefits & Long-Term Discount Rates



- *Humanity has the ability to make development sustainable: to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs. **WCED, 1987***
- *There is something awkward about discounting benefits that arise a century hence. For even at a modest discount rate, no investment will look worthwhile.*

The Economist, 1991

FUNDED BY VARIOUS GOVERNMENTS: UK, FRANCE, USA, NORWAY, SWEDEN, HOLLAND

FUNDED BY THE WORLD BANK FOR CYPRUS, MOLDOVA, UKRAINE

Innovations and Management for Sustainable Development

CBA - Ramsey Formula extended for Risk & Uncertainty (papers by Dasgupta, Gollier, Koundouri, Weitzman and others)

In an Uncertain Environment persistent shocks on:

- ✓ the growth rate of consumption
- ✓ short-term interest rates



DDR

Estimate Theory Consistent DDR trajectory

- *Using Historical Data*
- *Without Structural Model*
- *Using univariate time series regime switching models*

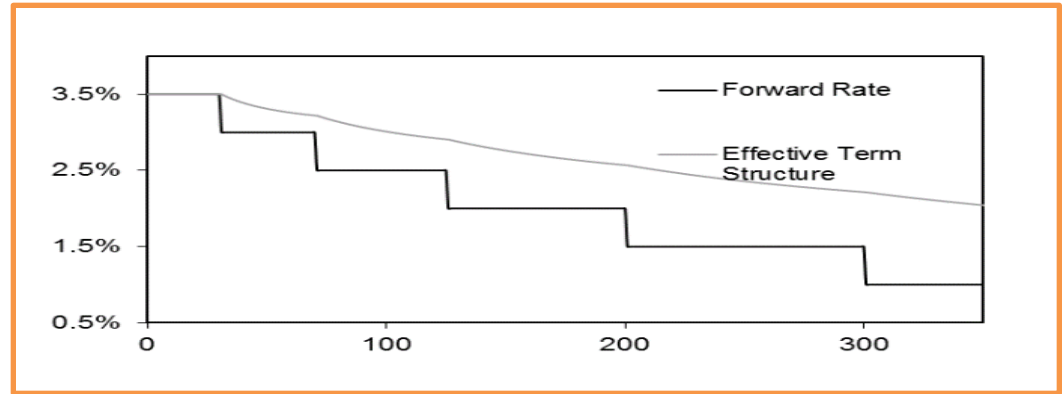
DDR for higher PV of Long-Run effects!

Example: *Climate Change Mitigation*

DDR implies double social cost of CO2 emissions

Innovations and Management for Sustainable Development

RECOMMENDED SCHEDULE OF DISCOUNT RATES PROVIDED



Country	Method	SDR%	LR (T>40) SDR Declining?	Risk & Uncertainty
EU Area	SRTP	3	Declining	Sensitivity Scenario Analysis Monte Carlo Simulations
UK	SRTP	3.5 – 1	Declining	
Sweden	SRTP	3.28- 3.5	Mentioned Not adopted	
Moldova	SRTP/SOC	4,63+9 (RP)	Declining	
Norway	SRTP/SOC	2.5+ 1.5(RP)	Declining	
Cyprus	SRTP/SOC	2.5+ 1.5(RP)	Declining	Sensitivity Analysis
Ukraine	SRTP/SOC	5+ 7(RP)	Declining	Sensitivity Analysis



Research Lab on Sustainable Economic and Environmental Sustainability (RESSE)



Education and Training

International, Regional, National Conferences, Workshops, Training Seminars & Research, Policy, Business Events

ADVANCED POLICY WORKSHOP IN SUSTAINABILITY AND RESOURCE VALUATION

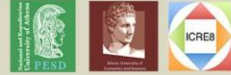
28 June 2017
Athens, Greece

Under the auspices of



ORGANIZERS

Political Economy of Sustainable Development Lab (PESD),
Department of Economics, National and Kapodistrian University of Athens
in collaboration with
Athens University of Economics and Business and
International Centre for Research on the Environment and the Economy (ICRE8)



www.icre8.eu | Local Organiser

BlueBRIDGE

RDA FISHERIES & ACQUACULTURE Datathon

ICRE8 Workshop
19 June 2017
Athens, Greece

Small text at the bottom of the BlueBRIDGE banner: "BlueBRIDGE received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 875992"

www.bluebridge-vres.eu

5th GLOBAQUA Training Course Economics of Sustainable Water Management in accordance to the Water Framework Directive, the Millennium Ecosystems Assessment & Sustainable Development Goals of the UN Agenda 2030

19-20 February 2018
Athens, Greece

Under the auspices of



Coordinator

The course is coordinated by Phoebe Koundouri, Professor of Economics and Econometrics, Athens University of Economics and Business (School of Economics) and London School of Economics (CGCEP), Scientific Director of ICRE8, SDSN-Greece chair.



OpenAIRE is the European online network that makes research output openly accessible to all.



It manages diverse research outputs across all disciplines, promotes and shares the results, effortlessly.

It is all about sharing, reusing and linking research information.



Our Vision

An SDG E-library for Greece

An Open Science directory of all past **20 years** completed and ongoing research publications, data and related models relevant to the 17 SDGs

A data source towards the implementation of the SDGs

immediate & long-term benefits to:

research communities research
organizations
funders, industry and... society

Literature

- ✓ Journal articles (OA and non-OA)
- ✓ White papers
- ✓ Pre-prints

Datasets

- ✓ Databases (SDG Indices, economic data, geophysical data, GIS data)
- ✓ Files

Projects

- ✓ Greek coordinators
- ✓ Greek partners
- ✓ Greek area as a case study

SDSN GREECE e-library

We're growing...

- ✓ SDG Open Science directory for [Greece](#)
- ✓ SDG Open Science directory for [SDSN-Mediterranean](#)
- ✓ **SDG Open Science**
directory for the global
[SDSN](#)



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Our Ongoing Projects



Letters of Support

