

Wetlands and Ecosystem Services



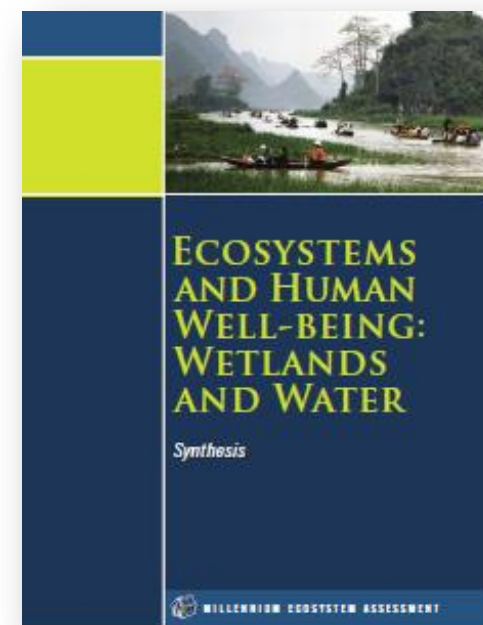
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Scientific and Technical Review Panel, Ramsar Convention

STRP Asia Regional Workshop, 10 October 2013, Changwon, South Korea

Background

- Millennium Ecosystem Assessment -> systematic focus on wetland ecosystem services status, trends , scenarios and response options
- Updation of wise use definition and explicit inclusion of ecosystem services in ecological character
- Increasing focus of Convention guidance and outreach on cross sectoral linkages : human interface (wetlands and human health, water resources, poverty ...)-> **Changwon Declaration**
- Emphasis on valuation as a tool to support decision making
- TEEB : Water and Wetlands Synthesis (Released on World Wetlands Day)



High Priority Tasks

- **Conduct a user needs analysis** for Ramsar Parties & wetland (site managers) on tools, knowledge, methodology and data required to support integration of ecosystem service values in planning and decision making;
- **Conduct a scoping review of the advancements in ecosystem services** (description/recognition, valuation, capture) to support wise use of wetlands, in particular cross sectoral integration;
 - Conduct a scoping review of technical aspects of relevance to the Ramsar Convention in the finance, banking, investment, insurance and other economic sectors; (currently being rolled into implementation of c)
- Develop **a guide to guidance on best practices for integrating ecosystem services values within the response options** for wetland management;
- Develop an **assessment mechanism for the contribution of wetland services/benefits to national GDPs**.

Session Agenda

- **TEEB – Water and Wetlands Synthesis**
Discussions
 - Relevance of TEEB approach for managing your wetlands
 - What support needs are required for integrating ecosystem service values in wetland management planning and decision making?
- **Applying Ramsar Guidelines for Valuing Benefits Derived from Wetland Ecosystems**
Discussions
 - Utility of guidelines for wetland managers
 - Support needs

Session Agenda

Concluding Discussions

- How do we increase relevance of STRP work on economics of ecosystem services ?
- How can NFPs support implementation of tasks ?
- What tasks are of specific interest and why ?

Session Agenda

Concluding Discussions

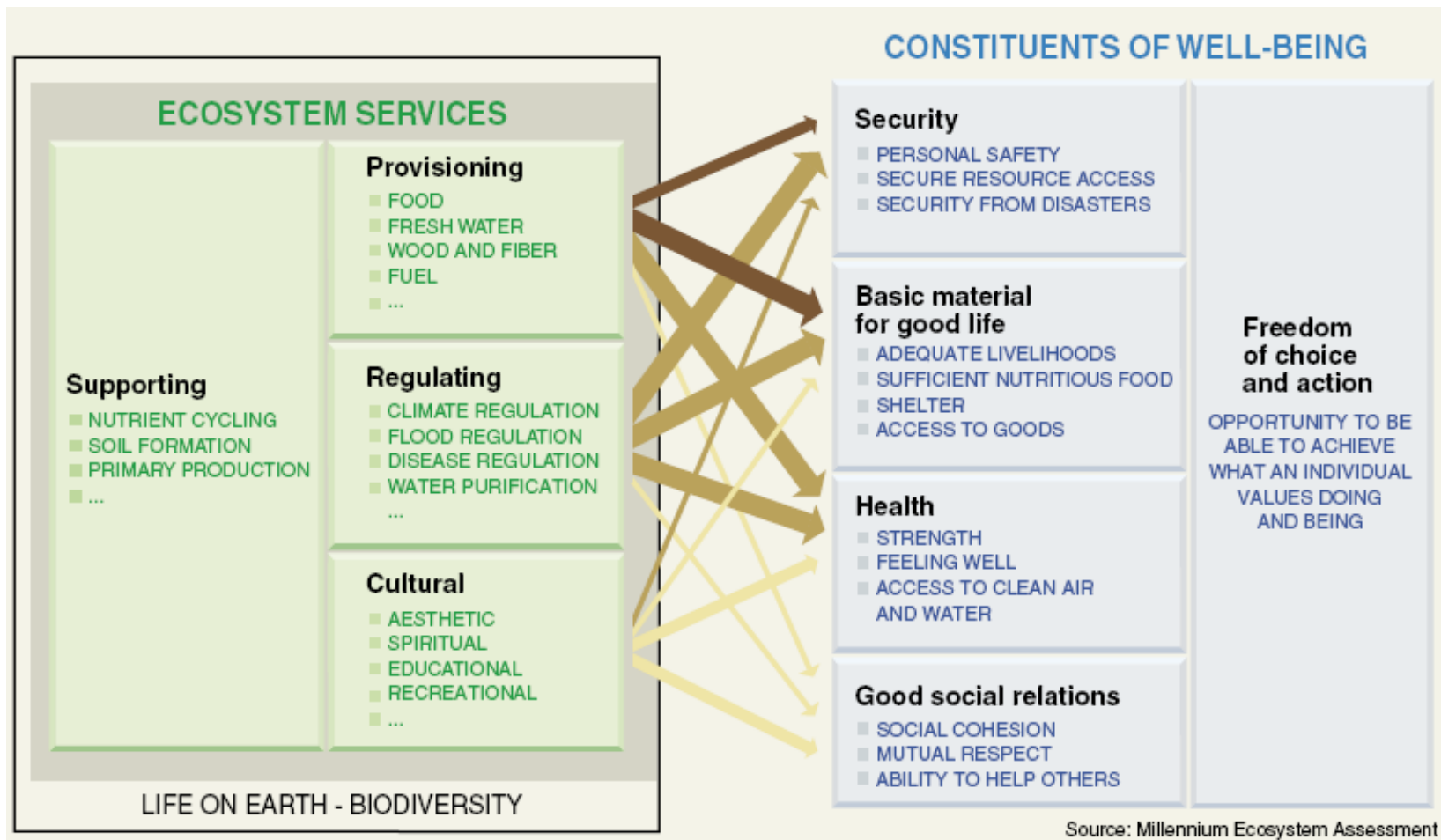
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Ecosystem Services

- Functional construct – stock flow relationship
- Ecosystems (including components and processes) are stock of natural capital -
> ecosystem services are flows from stocks
- Benefits that humans derive from ecosystems (Millennium Ecosystem Assessment, 2005)
- Service becomes benefits when there are humans to consume these

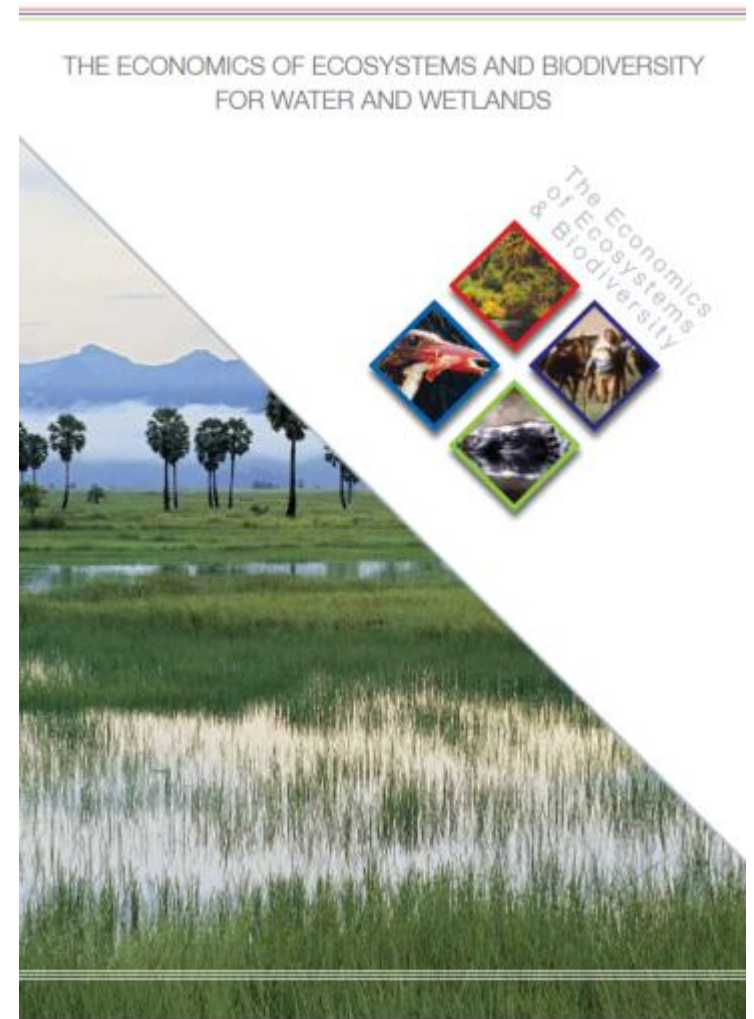


Ecosystem Services



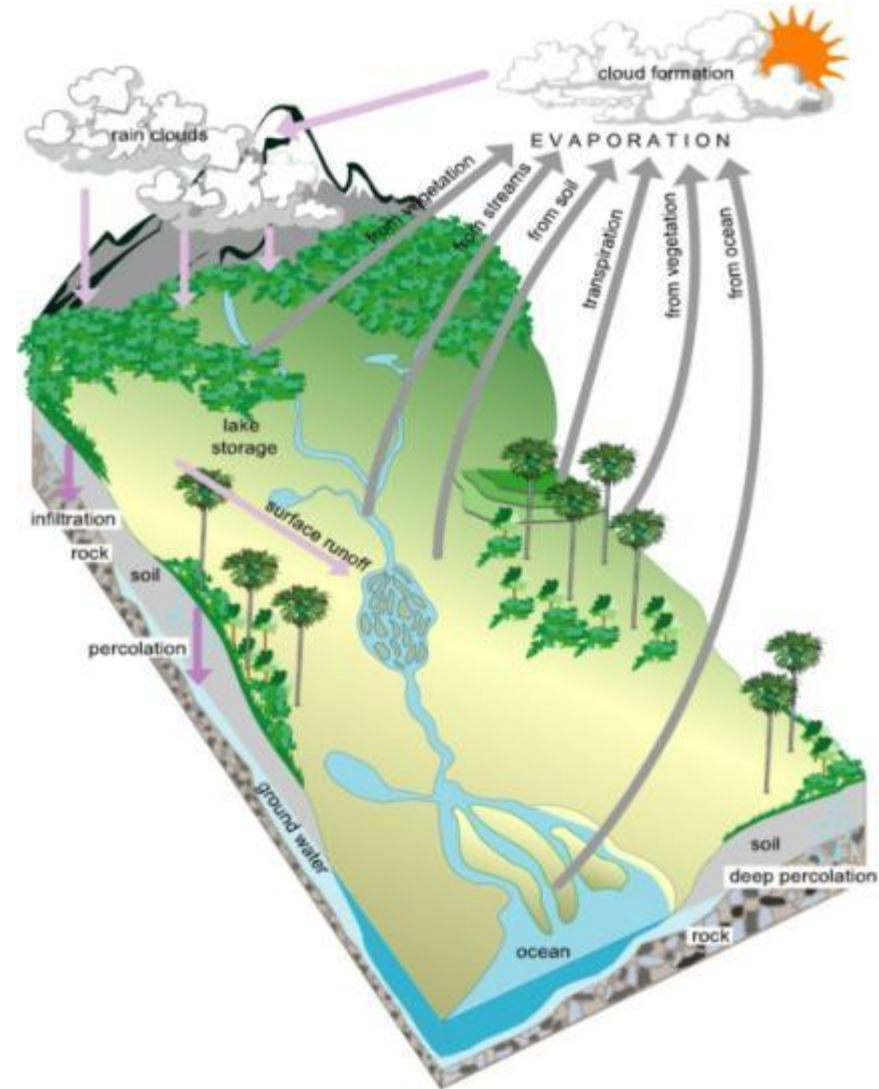
The Economics of Ecosystems and Biodiversity

For Water and Wetlands

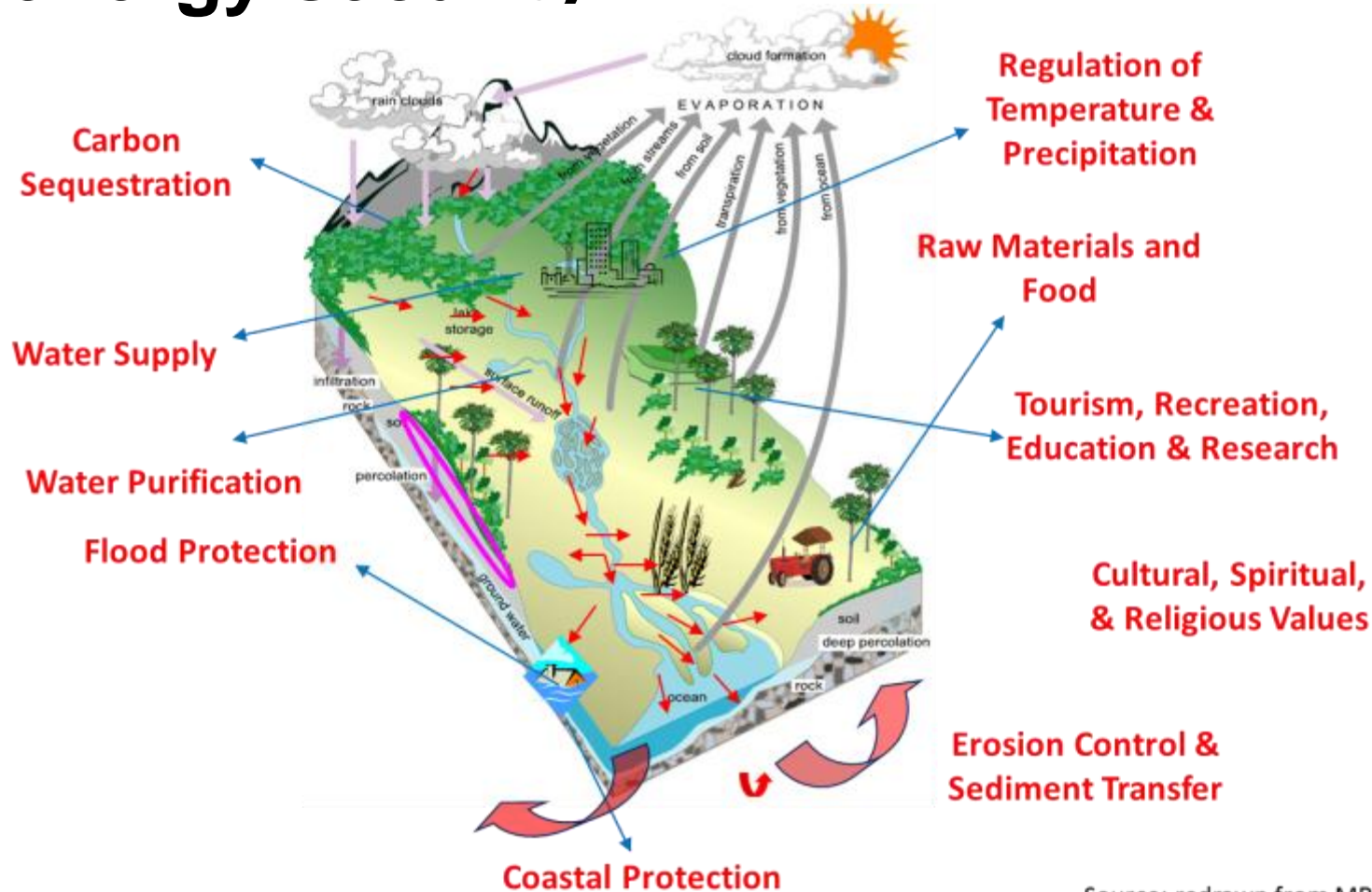


Wetlands central to water, food and energy security

- Nexus between “water, food and energy” is the most fundamental challenge for sustainability
- Global and local water cycles are strongly dependent on wetlands ; without wetlands water, carbon and nutrient cycles will be significantly altered



Wetlands central to water, food and energy security



Source: redrawn from MRC (2003)

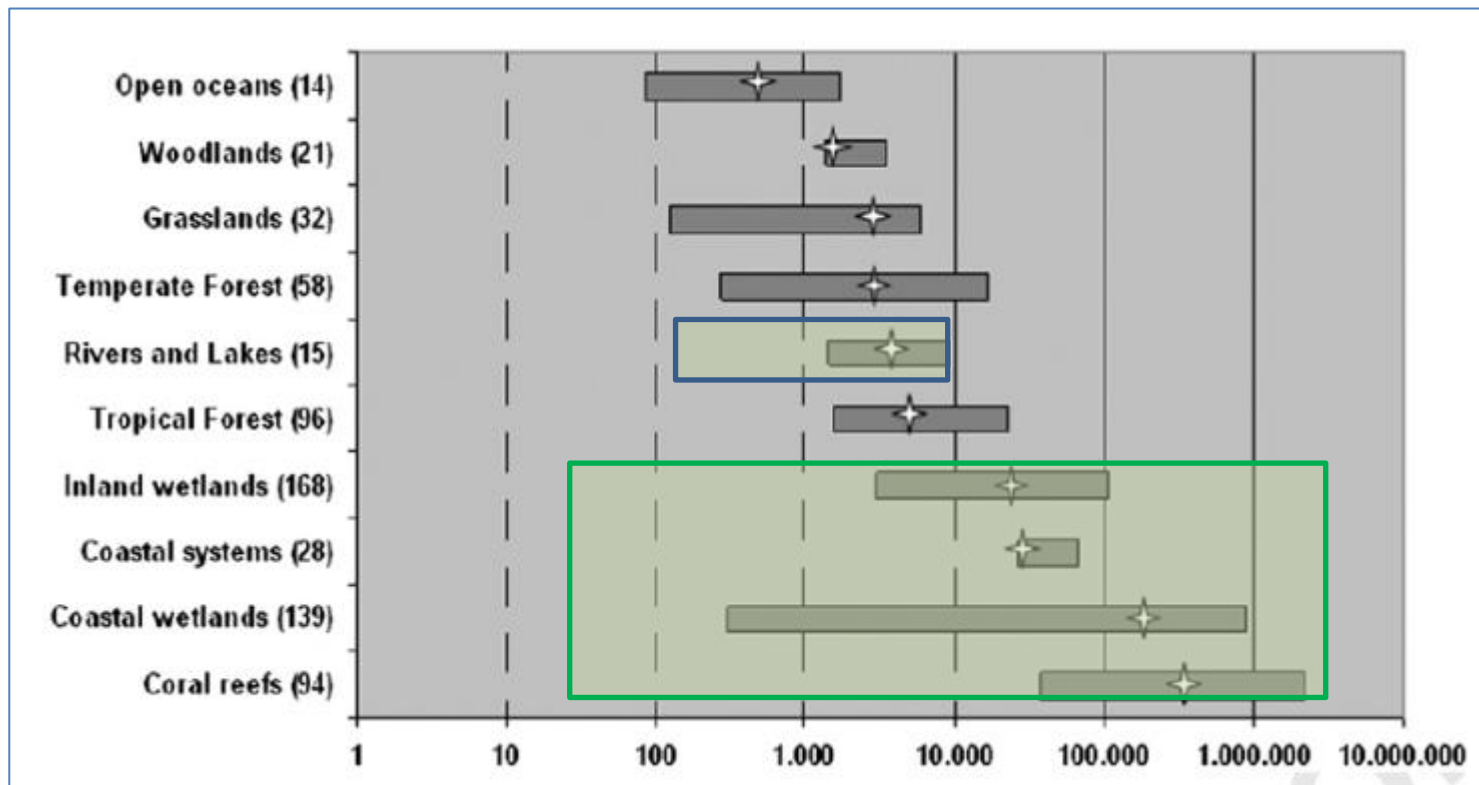
Yet policies for food, water and energy security tend to exclude wetlands; under represent their ecosystem service values

TEEB Report: Value of water and wetlands



- Focuses on values of water and wetlands to economy and linked policy environments
- Commissioned by Ramsar – partnership with IEEP, Wetlands International, IUCN, Convention on Biological Diversity
- Draft released in CBD CoP 11, October 2012, Hyderabad, India
- Full report released in World Wetlands Day 2013 Theme – Water and Wetlands

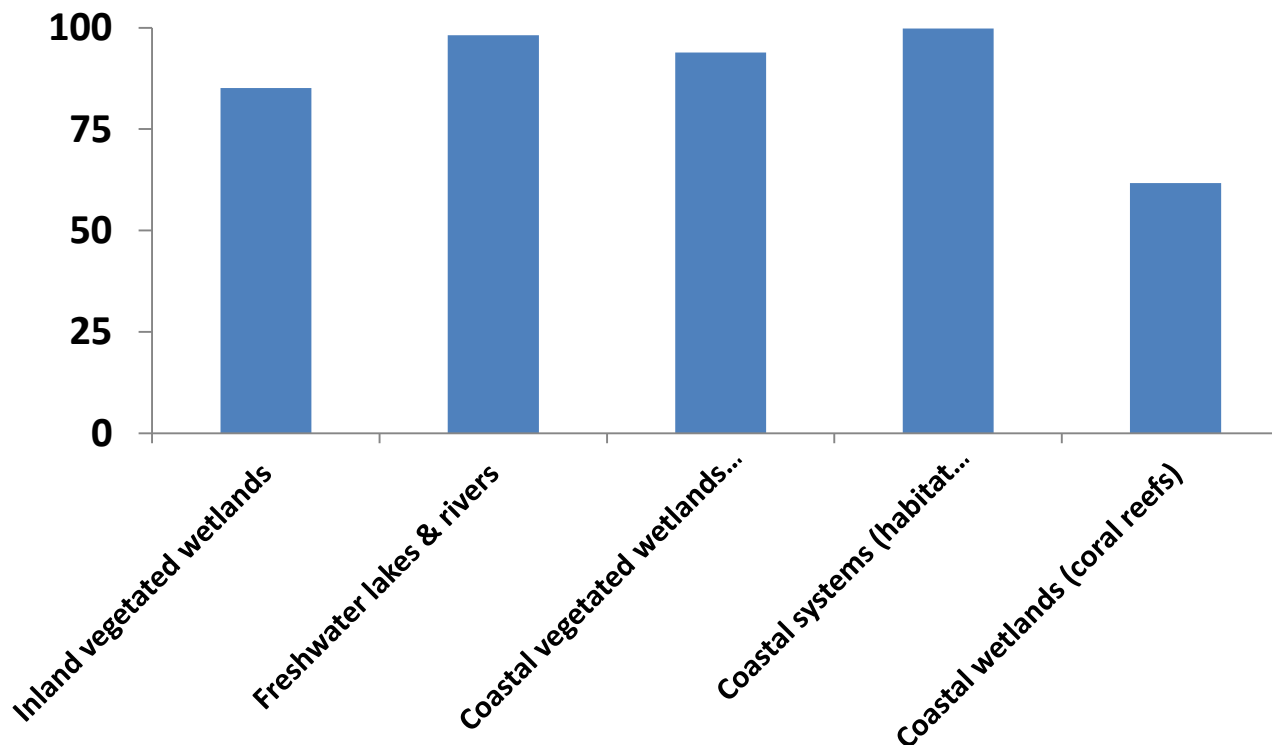
Wetlands give us a huge value



Major proportion of values are water related

Water-related service values as % of total provisioning & regulating services

Services included: freshwater supply, moderation of extreme events, regulation of water flows, waste treatment/water purification, nutrient cycling.



Wetlands as solutions to water security through multiple ecosystem services, meeting a range of policy objectives

Still wetland loss continues...

Danube River basin floodplains: **-68%**

UK estuaries: minimum: **-41%**

UK coastal grazing marshes: **-57%** since 1930

UK lowland raised bogs (peatlands): **-87%** since 1840

USA Inland wetlands: **-53%** (1780s-1980s)

Mangroves: **-20%** since 1990

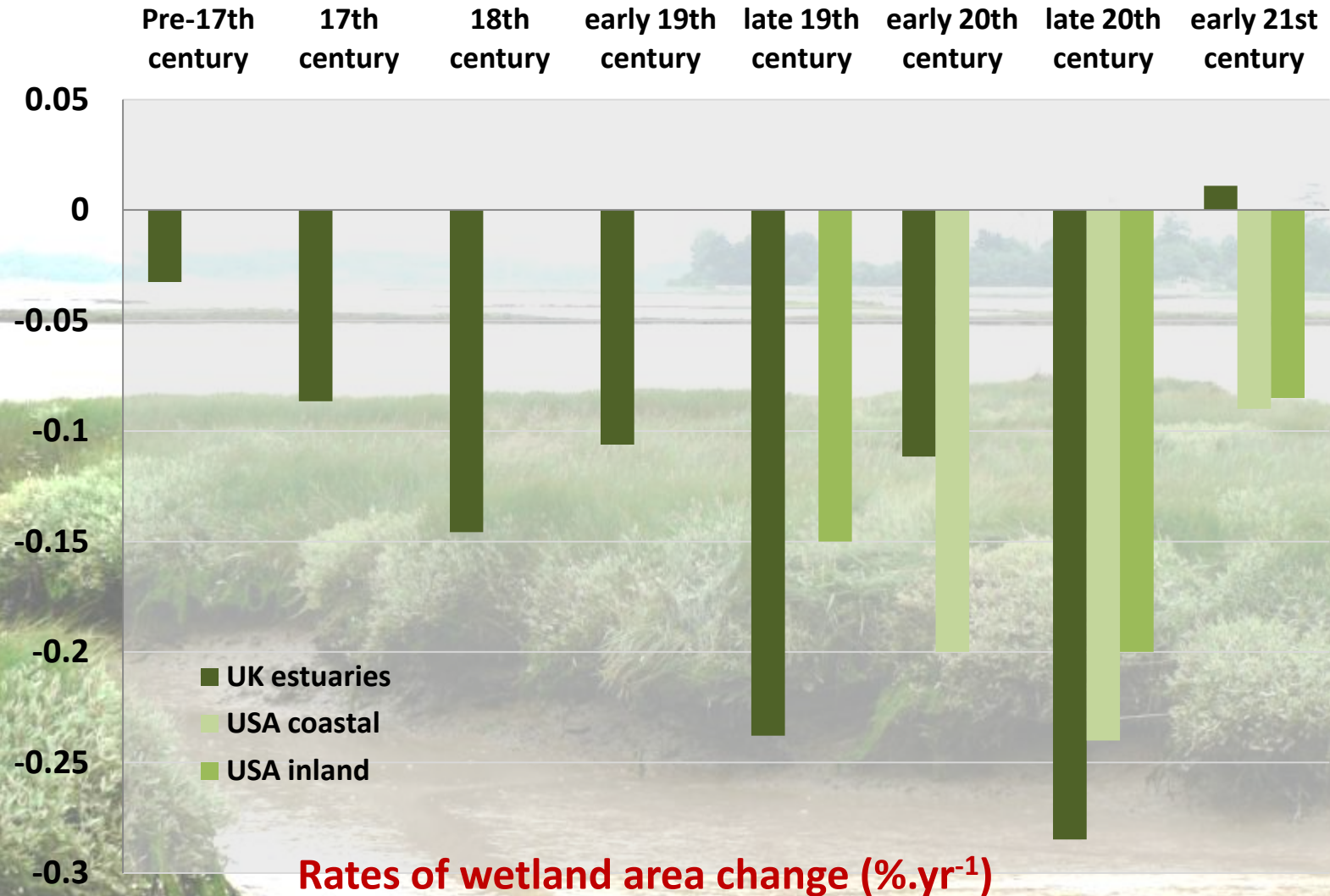
China (inland & coastal): **-33%** since 1978

Republic of Korea (coastal): **>-20%** since 1987

India: **>-30%** since 1970



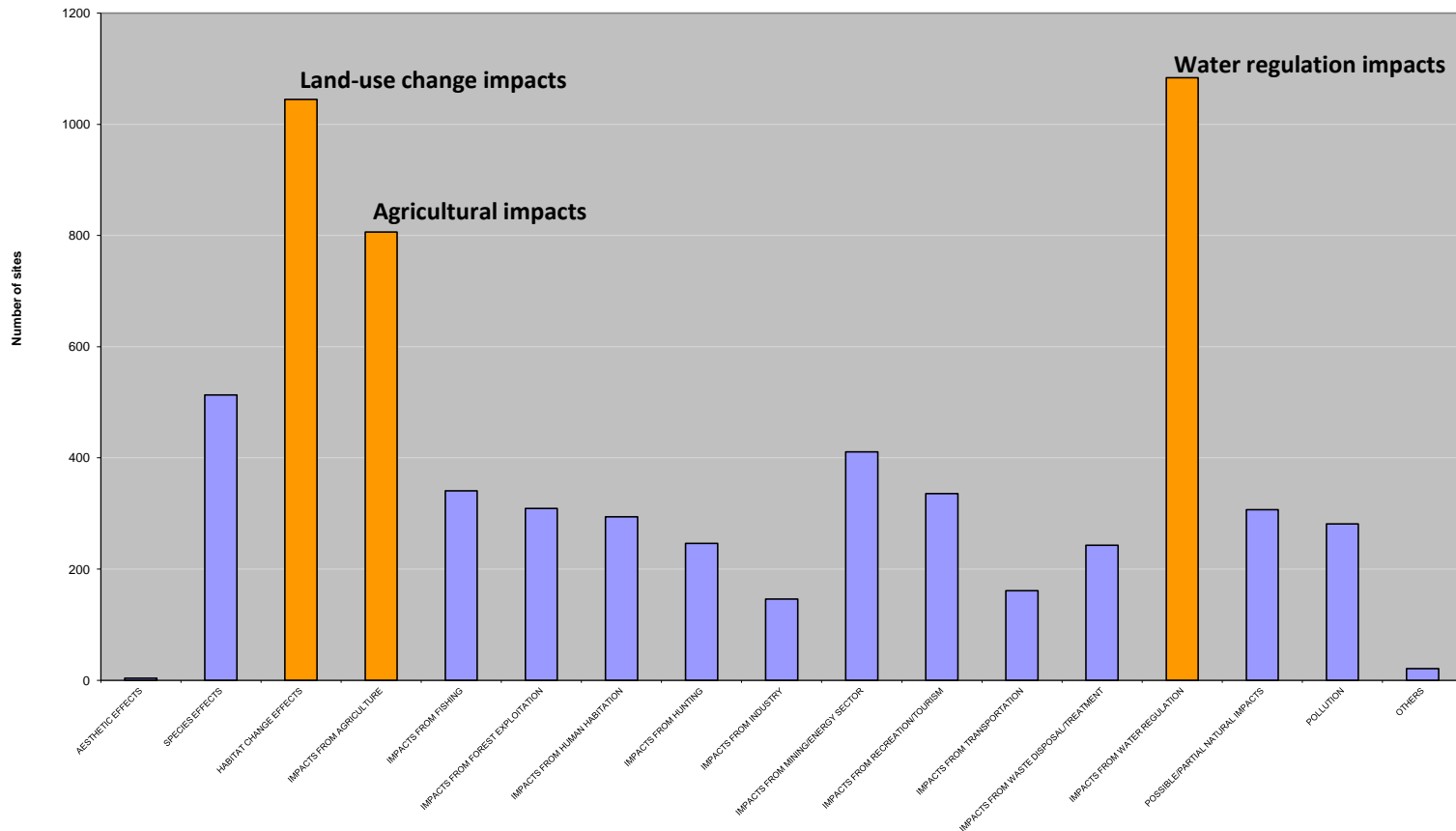
Wetlands are being lost



Rates of wetland area change (%.yr⁻¹)



Water and land use fragmentation major driver of wetland loss



Related to the way consumption and investment decisions are made for water and land resources

Costs of inaction are high

Coastal wetlands in the USA are estimated to currently provide **USD 23.2 billion.yr¹** in storm protection services alone

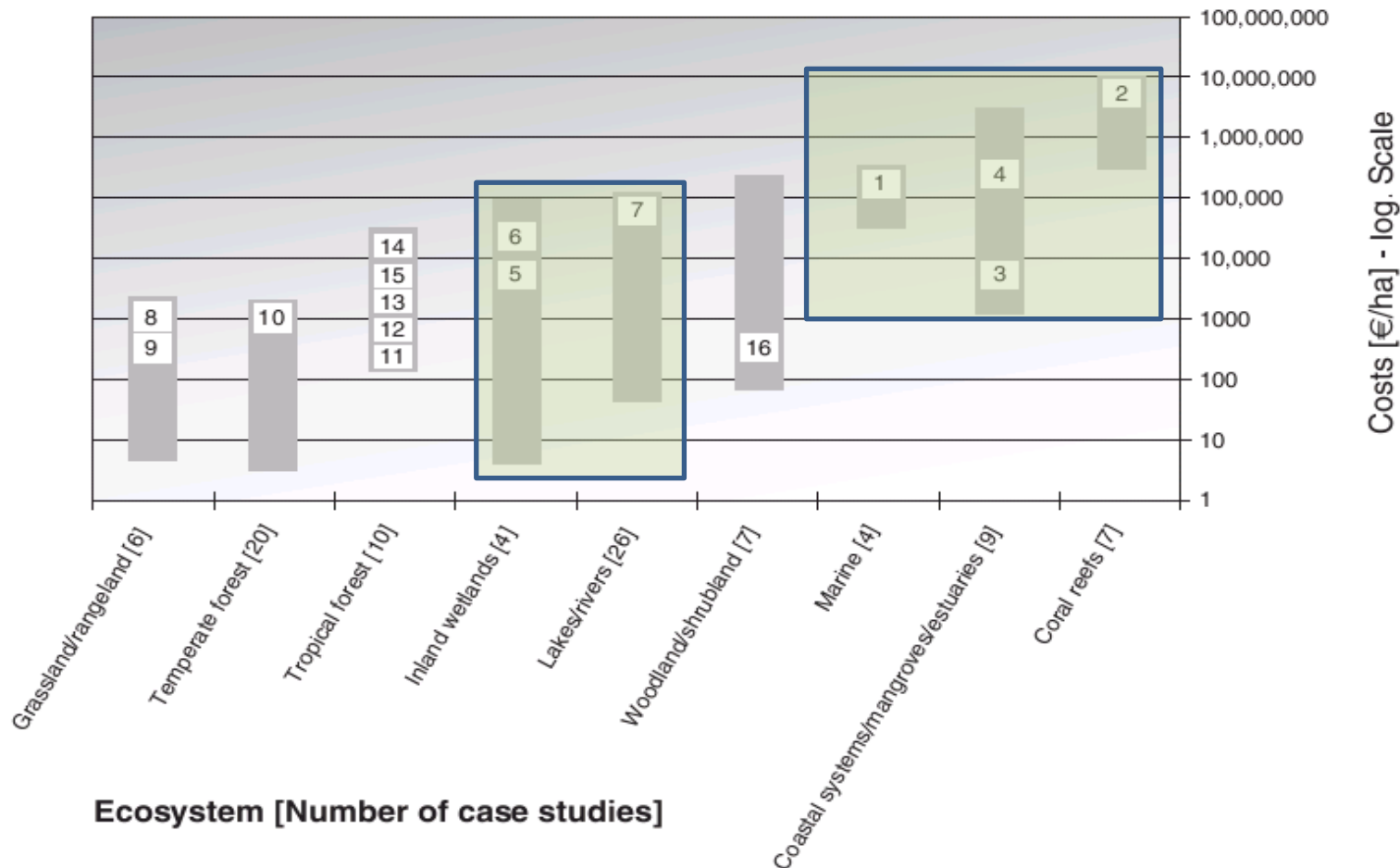
A **loss of one hectare** of such wetland = average increase in cost of storm damage from specific storms of **USD 33,000**

Costs of just one recent **summer flooding event in the UK**, in 2007, are estimated at £3.2 billion (**USD 5.2 billion**),

Damage and costs occurred largely in areas of **former river floodplain** converted to urban, industrial and infrastructure developments.



Costs of inaction are high



Need for a paradigm shift towards water and wetlands



- Place water and wetlands at the heart of green economy
- Recognize wetlands as 'natural infrastructure' solutions for water management



TEEB approach to water and wetlands



Mainstreaming ecosystem services into economic decision making

- **Recognizing** ecosystem services
- **Demonstrating** value of ecosystem services
- **Capturing** the values of ecosystem services

Measuring to manage better

Improved evidence base on interconnections between wetland ecosystems and social and economic systems

- Use of indicators
- Mapping
- Natural capital and environmental economic accounts
- Valuation of ecosystem services

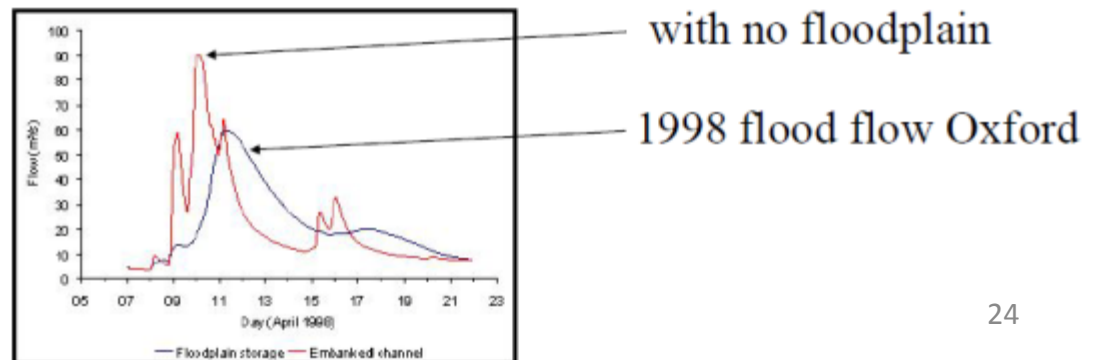
Measuring to manage better

Using ecosystem service indicators

Provisioning: amount of water extracted; quantity of fish and wetland plants harvested

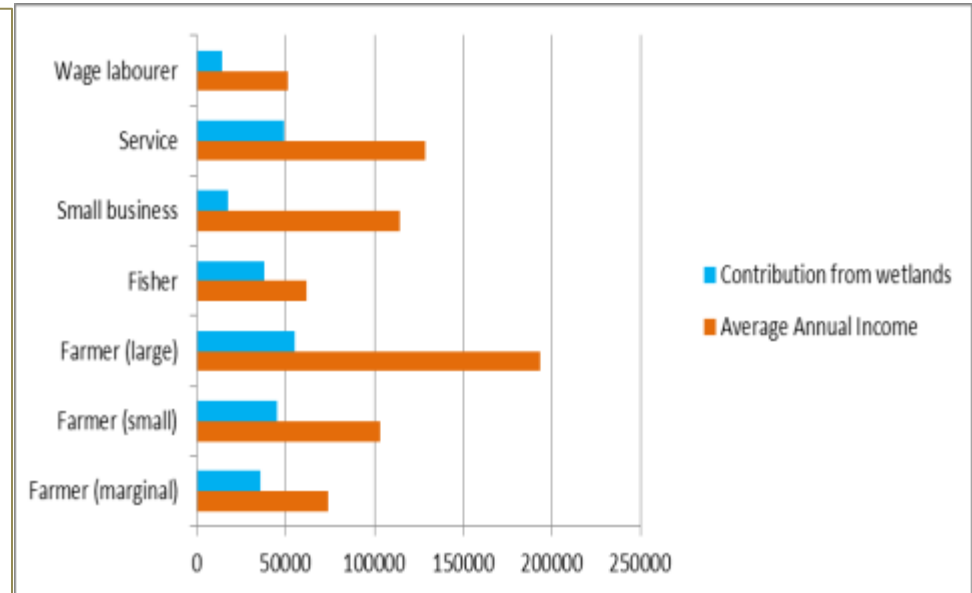
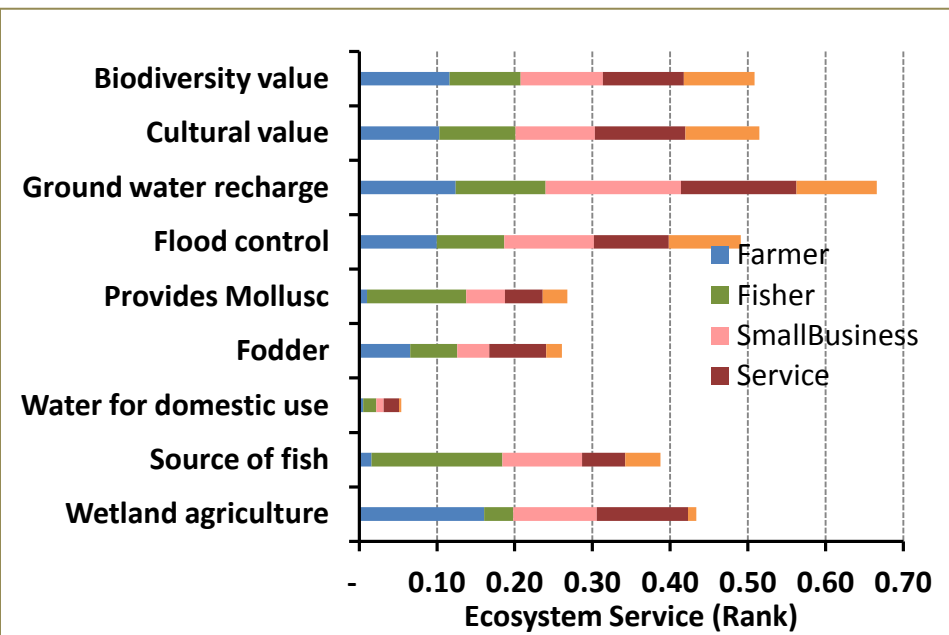
Regulating: % reduction in peak flows, extent of nutrients removed

Cultural: number of tourists, local cultures and practices related to wetlands



Measuring to manage better

Stakeholder preferences for ecosystem services



Measuring to manage better

Mapping ecosystem services

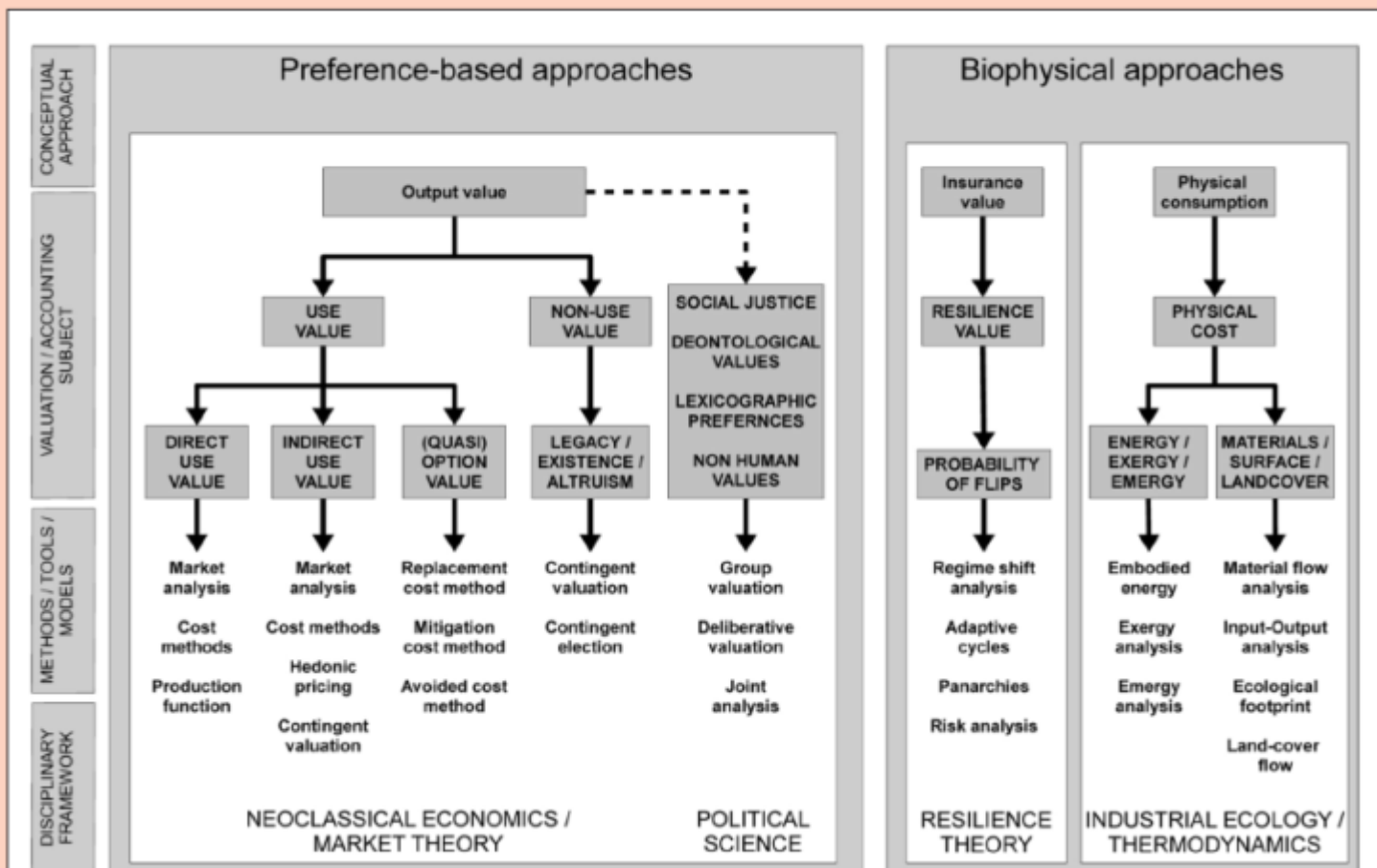
- InVEST (Integrated Valuation of Ecosystem Services and Tradeoffs) - a software package developed by the Natural Capital Project
- Models ecosystem services on the basis of biophysical and economic 'production functions'
- Used in Baotou City to assist Chinese local government with Ecological Function Conservation Areas (EFCA), in order to integrate ESS into the Baotou Land Use Master Plan
- InVEST's sediment retention, water retention and carbon models were used to estimate and map the annual average delivery of the ESS



Measuring to manage better

Valuing ecosystem services

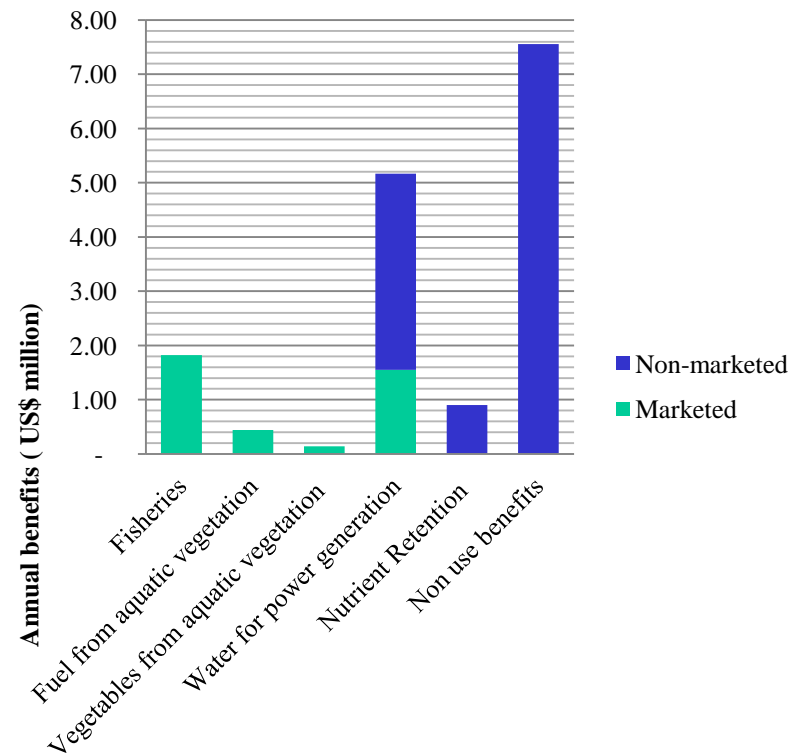
Figure 1: Approaches for the estimation of nature's values



Measuring to manage better

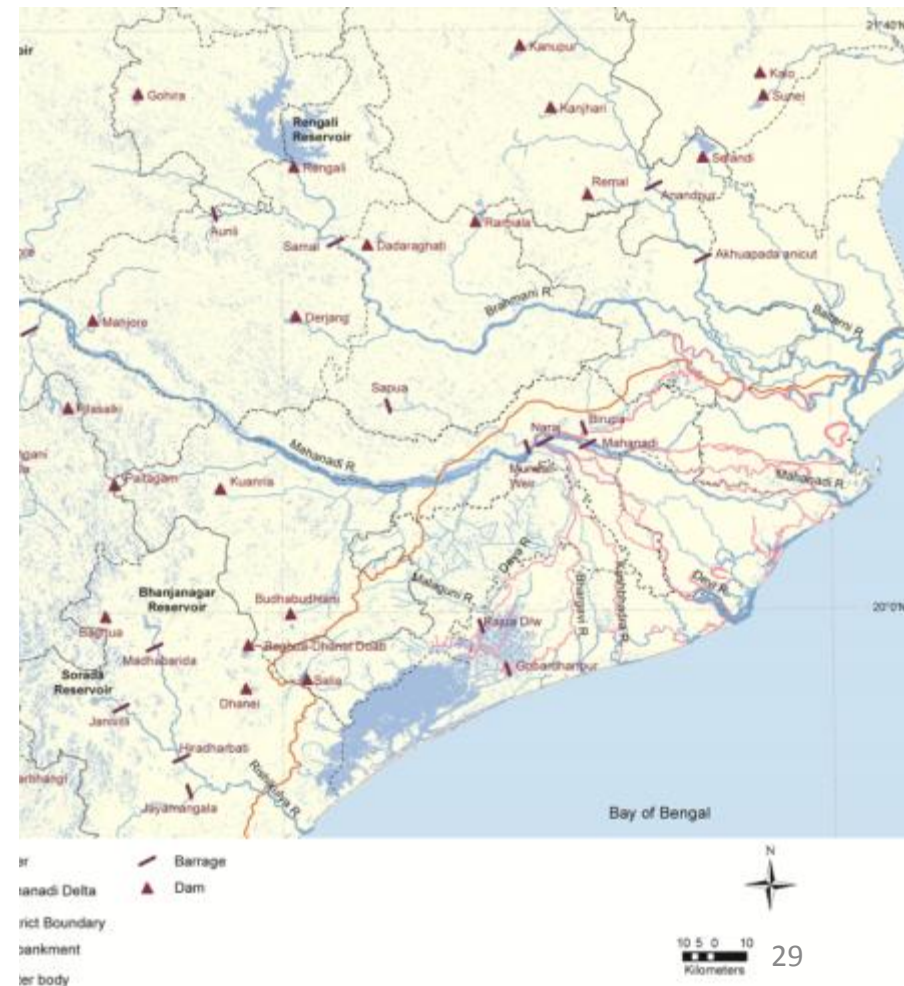
Valuing ecosystem services

- Loktak Lake in Northeast India provides a range of ecosystem services
- Yet focus has just been on using lake waters for hydropower production
- Valuation used to highlight the contribution of full range of ecosystem services



Integrating value of water and wetlands in decision making

- Wetlands and integrated water resource management
- Improving site management
- Regulation and land use planning
- Property rights and improving distribution of costs and benefits
- Market based instruments



Integrating value of water and wetlands in decision making



Improving distribution of costs and benefits

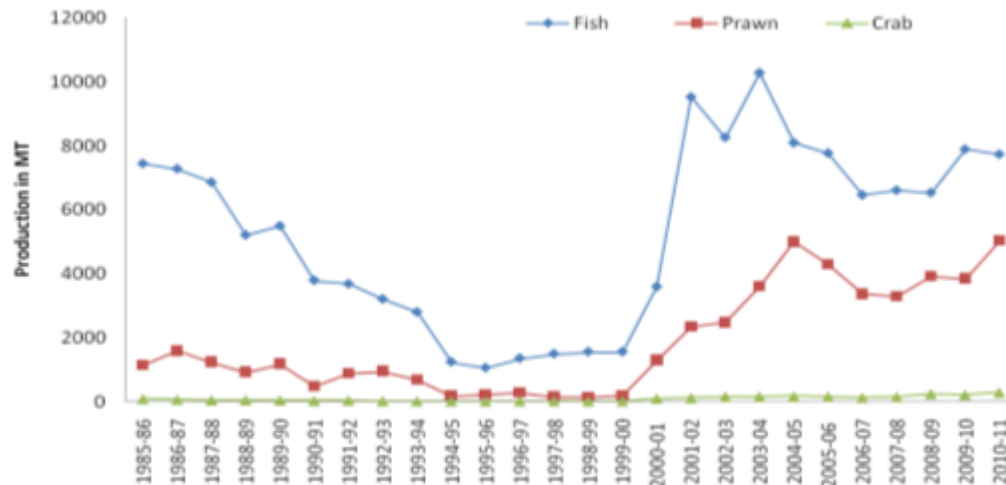


Table 3 Changes in select socio-economic parameters for fisher communities of Chilika.

Parameter	1999 ^(a)	2007 ^(b)
<i>Population:</i>		
Number of fisher households	12 363	16 710
Number of active fishers	27 200	32 200 ^(c)
<i>Productivity:</i>		
Average annual fish catch per active fisher (kg)	64.2	309.2
Average annual fish catch per boat (kg)	321.7	1 213.7
<i>Infrastructure:</i>		
Number of fishing boats	5 425	6 520 ^(d)
Number of fish landing centers	12	18
<i>Income and expenditure:</i>		
Average annual income (per capita) in US\$ (at current prices)	84	113
Average annual consumption expenditure (per capita) in US\$ (at current prices)	85	
<i>Indebtedness:</i>		
% households having loan outstanding	86%	88%
% loans sourced from informal sector	71%	70%
Average amount of debt per fisher household (US\$)	398	738
% component of fishing equipment per working capital of the total loan	55%	72%

Integrating value of water and wetlands in decision making

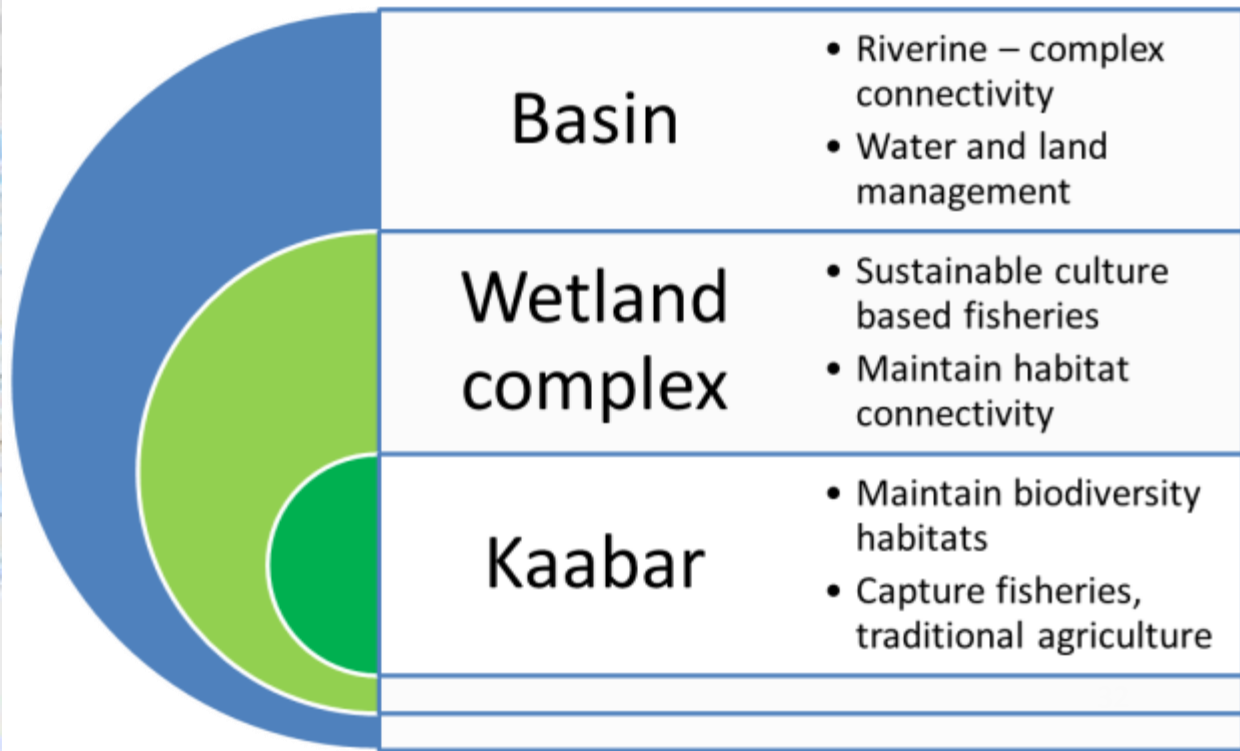


Improving distribution of costs and benefits

	Gross value added (Rs. Lakhs)	Net value added (Rs. Lakhs)		Population	Gross Value added per capita (Rs. Lakhs)	Net value added per capita (Rs. Lakhs)	
		Excluding opportunity cost of time	Including opportunity cost of time			Excluding opportunity cost of time	Including opportunity cost of time
Fisher (indebted)	4,779.76	3,614.26	-1,333.38	25,678	0.19	0.14	-0.05
Fisher (non-indebted)	1,941.21	1,531.71	-206.65	9,022	0.22	0.17	-0.023
Retailer	458.42	458.42	-6.58	2,416	0.19	0.19	-0.003
Mahajan	1,323.87	1,011.87	703.87	483	2.74	2.09	1.46

Integrating value of water and wetlands in decision making

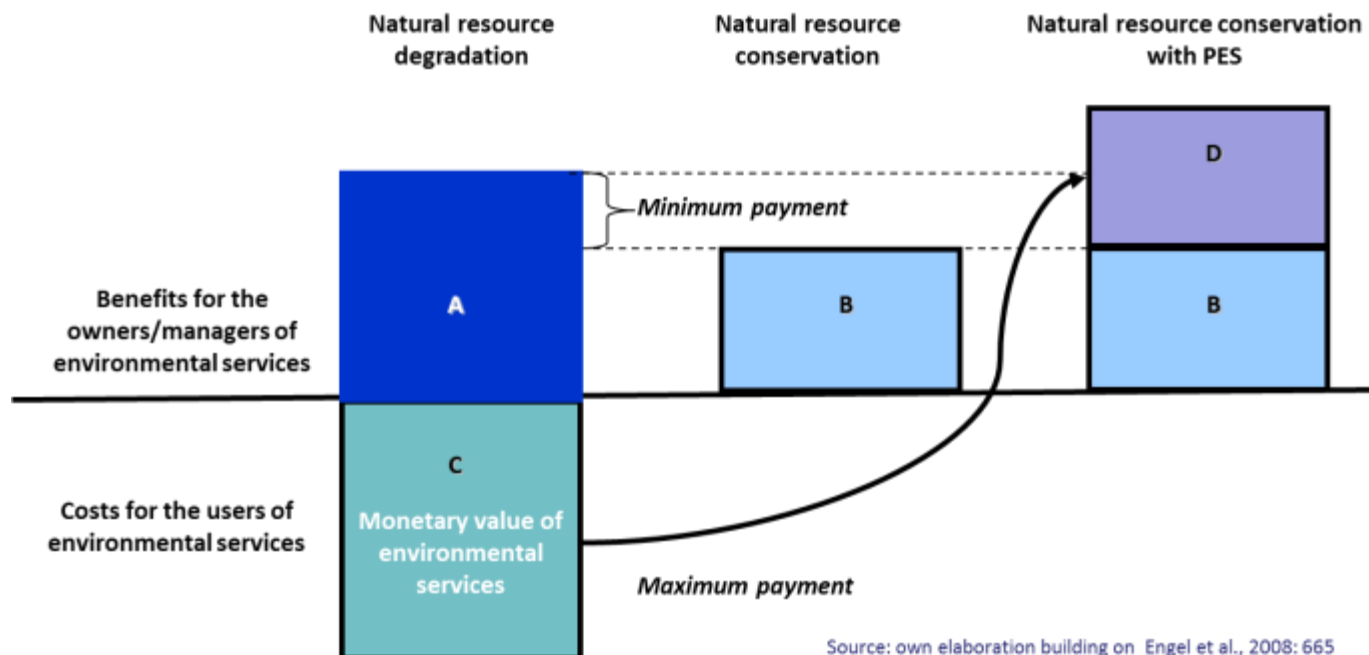
Regulation and land use planning



Integrating value of water and wetlands in decision making

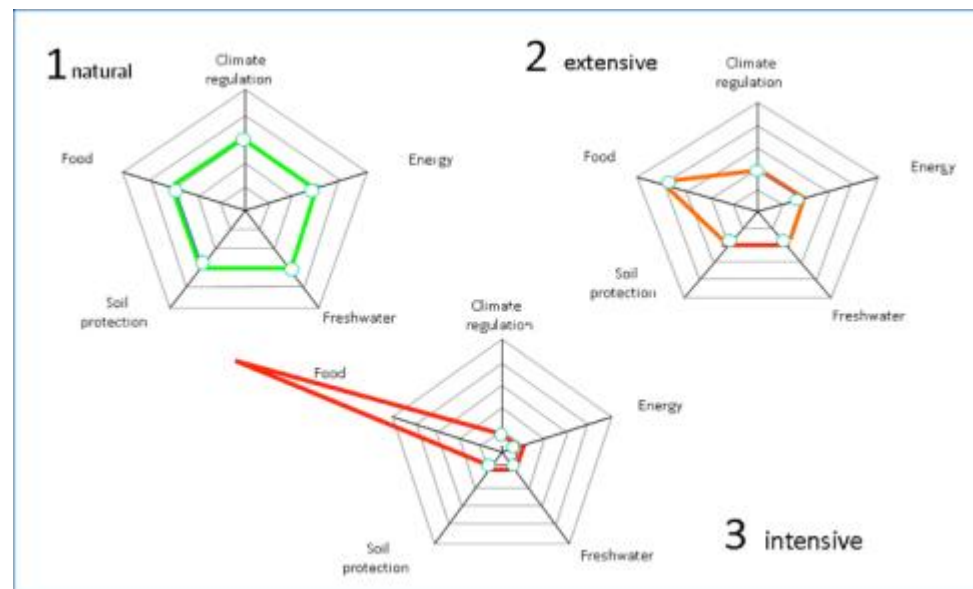
Improving distribution of costs and benefits

PES aim to protect ESS by transferring resources from ESS beneficiaries to providers, compensating them for the positive externalities they provide to society or to specific social actors, or for their efforts in reducing negative externalities



Transforming management approach

- Managing water and wetlands for full range of values
- Capitalizing on link between sustainable wetland management and livelihoods
- Managing conservation – development tradeoffs
- Communication and awareness raising



What does TEEB offer for management?



- TEEB – intends to shift the debate from 'wetlands for biodiversity' to 'wetlands for water, food and energy security'
- Argues for better connecting ecosystem service values to policy and decision making contexts (sites, river basins, sectors)
- Focuses on **values** of wetlands – economic as well as non-economic

What does TEEB offer for management?



- Inventory and assessment – making available datasets on anthropocentric construct of wetland components and processes
- Communication – making ecosystem values explicit
- Site management – managing for wider range of ecosystem services; understanding risks -> RIS
- Negotiation – expressing tradeoffs for stakeholders
- Financing – helping secure allocation of resources for wetland management

Questions

- Relevance of TEEB approach for managing your wetlands
- Support needs for integrating ecosystem service values in wetland management planning and decision making
 - Tools
 - Methods
 - Datasets
 - Case studies
 -

Table All.6. The number of wetland ecosystem valuation studies for the four main categories of services for different types of wetland (data from TEEB, 2010). Colour-codes are: green >10% of studies; amber 5-10%; yellow <5%.

Ecosystem Services/ wetland type	Coral reefs	Mangroves & tidal marshes	Coastal systems (habitat complexes)	Inland wetlands	Freshwater lakes & rivers	TOTAL
Provisioning	34	35	20	37	6	132
Regulating	19	28	6	33	4	90
Habitat	8	38	3	9	1	59
Cultural	43	13	9	13	5	83
TOTAL	104	114	38	92	16	364

Sources: TEEB (2010); de Groot et al. (2010)

Need to improve the knowledge base for inland wetlands, particularly lakes and rivers

Table AII.7. The total number of wetland ecosystem valuation studies on the main ecosystem service categories available from different geographical regions (data calculated from the TEEB database; Van der Ploeg and de Groot, 2010)³².

Ecosystem Services/ geographical region	Africa	Asia	Europe	Latin America and the Caribbean	Americas	Oceania	TOTAL
Provisioning	30	55	8	18	3	3	117
Regulating	7	30	10	20	9	6	82
Habitat	7	20	4	6	7	4	48
Cultural	5	21	9	13	14	13	75
TOTAL	49	126	31	57	33	26	322

Sources: Van der Ploeg and de Groot (2010); Van der Ploeg et al. (2010)

Further valuation research should be more widely distributed across the globe