Sustainable management of ecosystem services for wetland management, aquaculture development and climate change adaptation in the Mekong Delta

Håkan Berg
hakan.berg@natgeo.su.se
Associate Professor
Department of Physical Geography & Quaternary Geology
Stockholm University

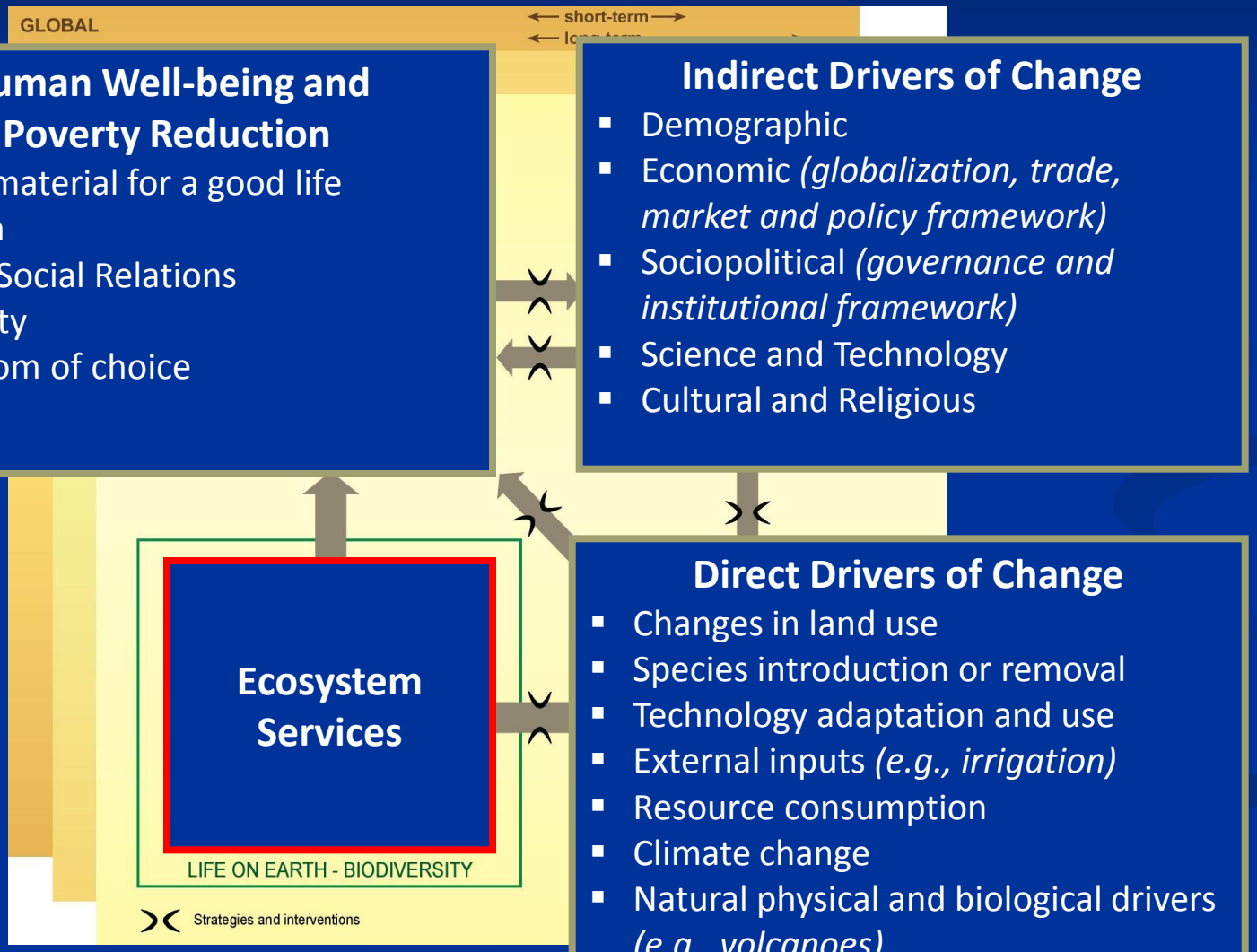
Points of departure

High wetland biodiversity but limited awareness and information about their ”values”

The high biodiversity and associated ecosystems services critical for peoples livelihoods and wellbeing

Trade-offs necessary in the future. How should these be assessed and managed? Need for good governance!

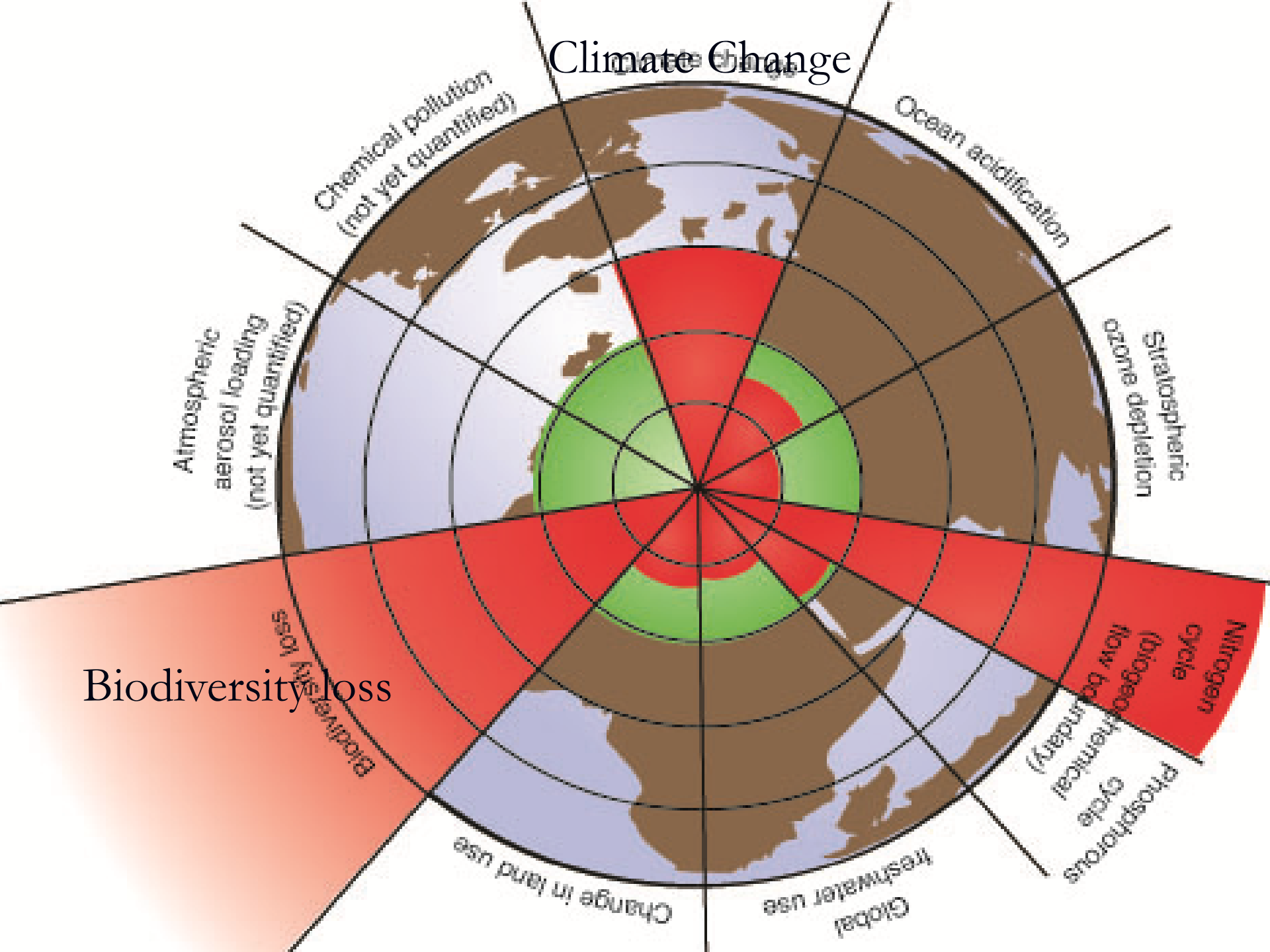
Need for a systems view- The MA Framework



Driver of change: Population growth, urbanisation and industrialisation

Agriculture and aquaculture intensification

Hydropower development and climate change


Climate Change
Ocean acidification
Stratospheric ozone depletion
Nitrogen cycle (biogeochemical flow boundary)
Phosphorous cycle (biogeochemical flow boundary)
Global freshwater use
Change in land use
Biodiversity loss
Atmospheric aerosol loading (not yet quantified)
Chemical pollution (not yet quantified)
Biodiversity loss

A focus on enhanced biodiversity because it is crucial for peoples livelihoods, and probably enhance systems resilience….

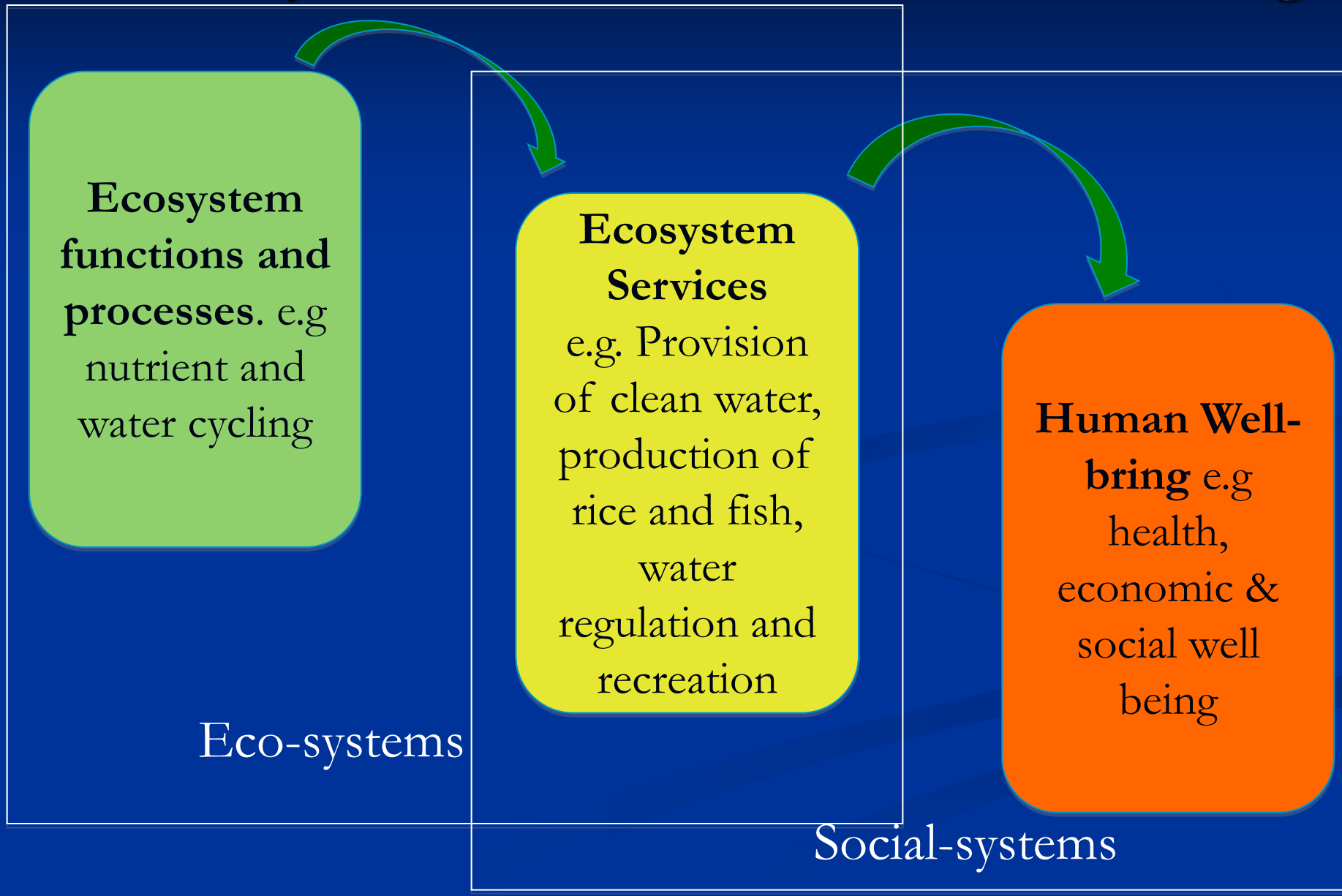
…and provides ecosystem services

Provisioning

Regulating

Cultural

Ecosystem Services provide a link between ecosystem functions and human well being



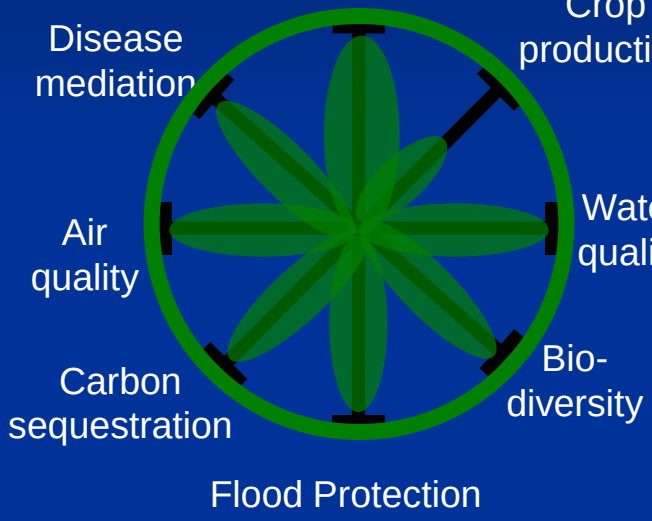
A focus on wetlands and aquaculture in the Delta

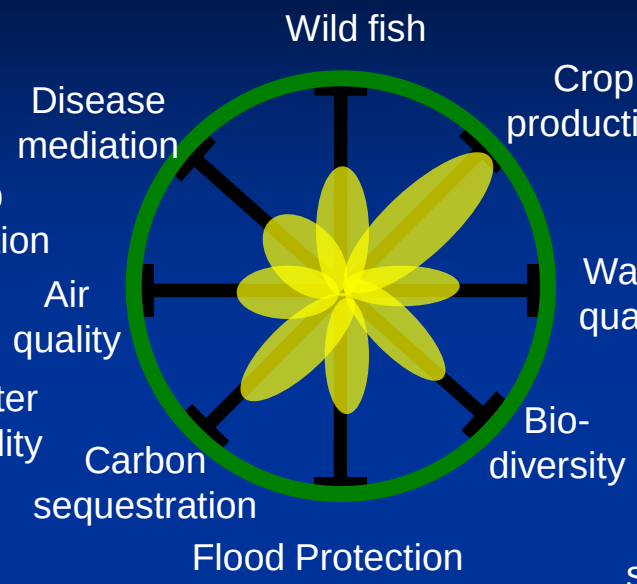
Catfish farming along the Mekong River

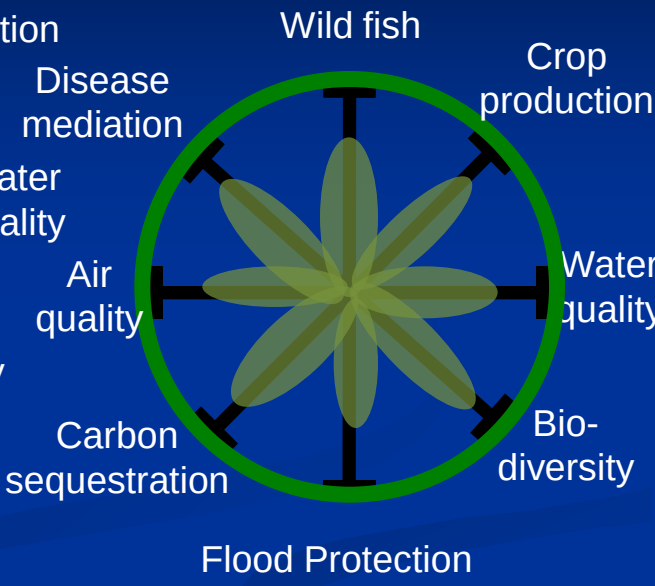
Shrimp farming in mangroves and estuaries

Rice-fish farming in floodplains

Optimising "bundles" of ecosystem service

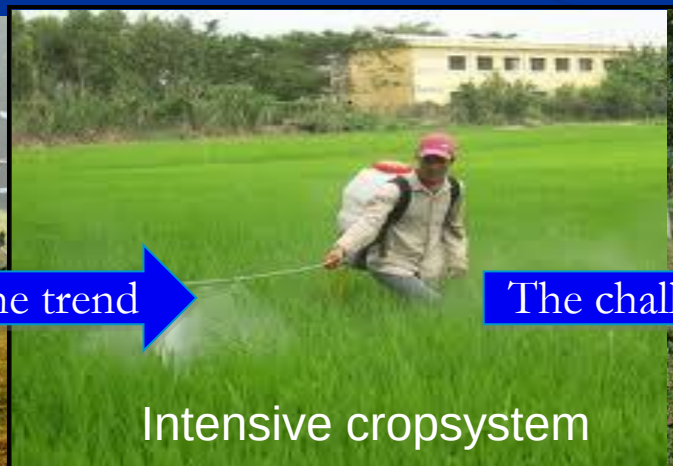







Natural Ecosystem

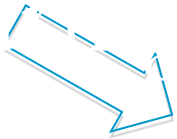
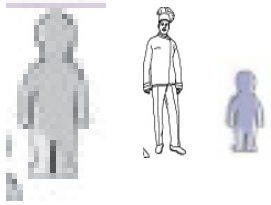
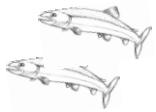
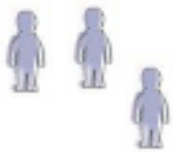
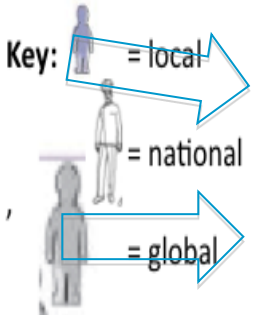
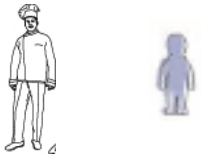
The trend


Intensive cropsystem

The challange

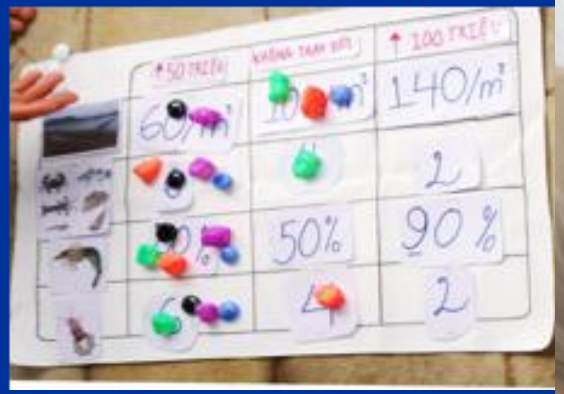

Diversified cropsystem

A pr
and

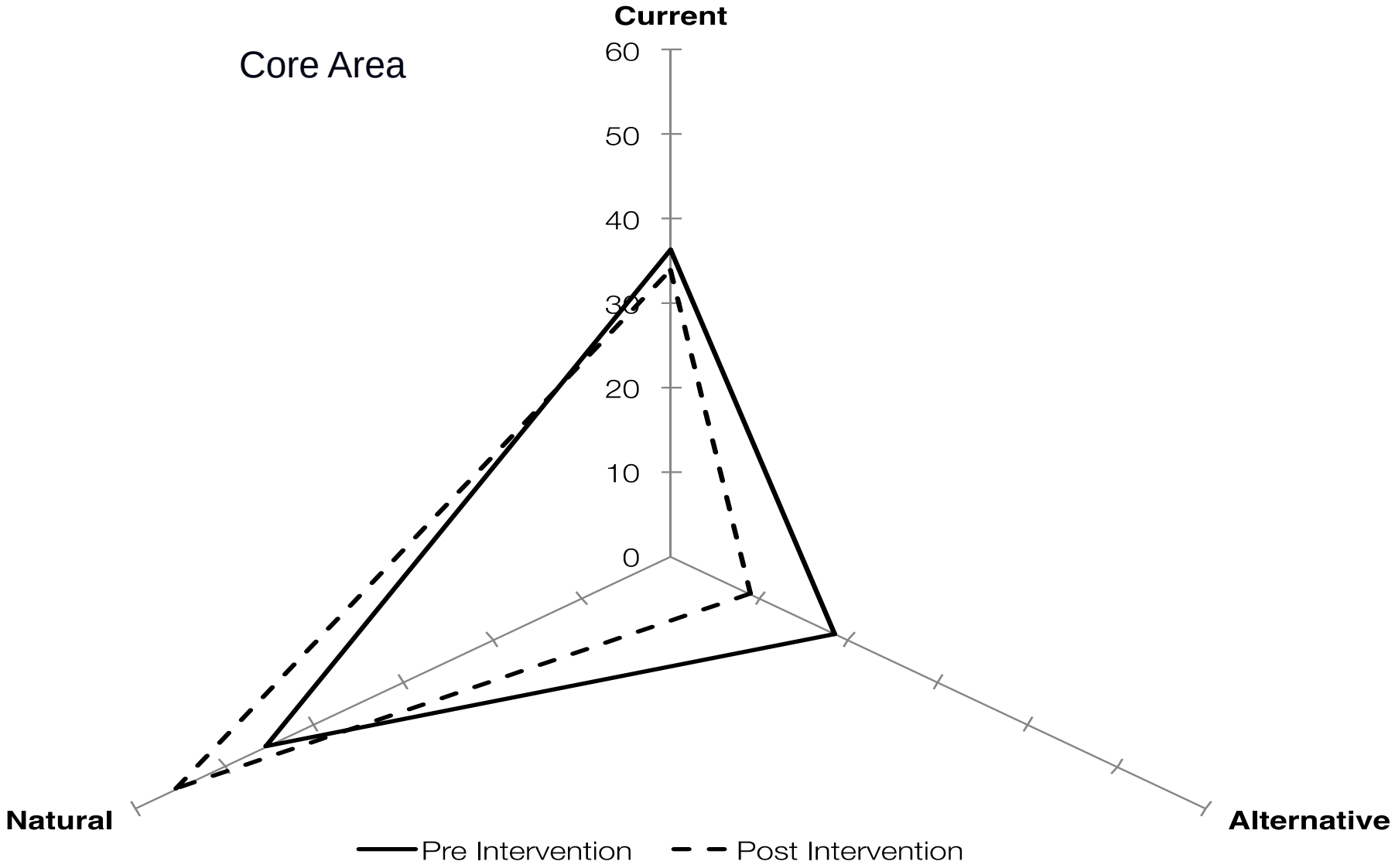
Ecosystem services	Extensive "sustainable" scenario	Intensive "BaU" scenario	Going from from Scenario 1 to 2: who gains	who loses	Climate Change resilience
Farmed shrimp					
Clean Water					
Climate regulation					
Storm protection					
Wild Fish					
Eco-tourism					

Stakeholder consultations a key part of the process

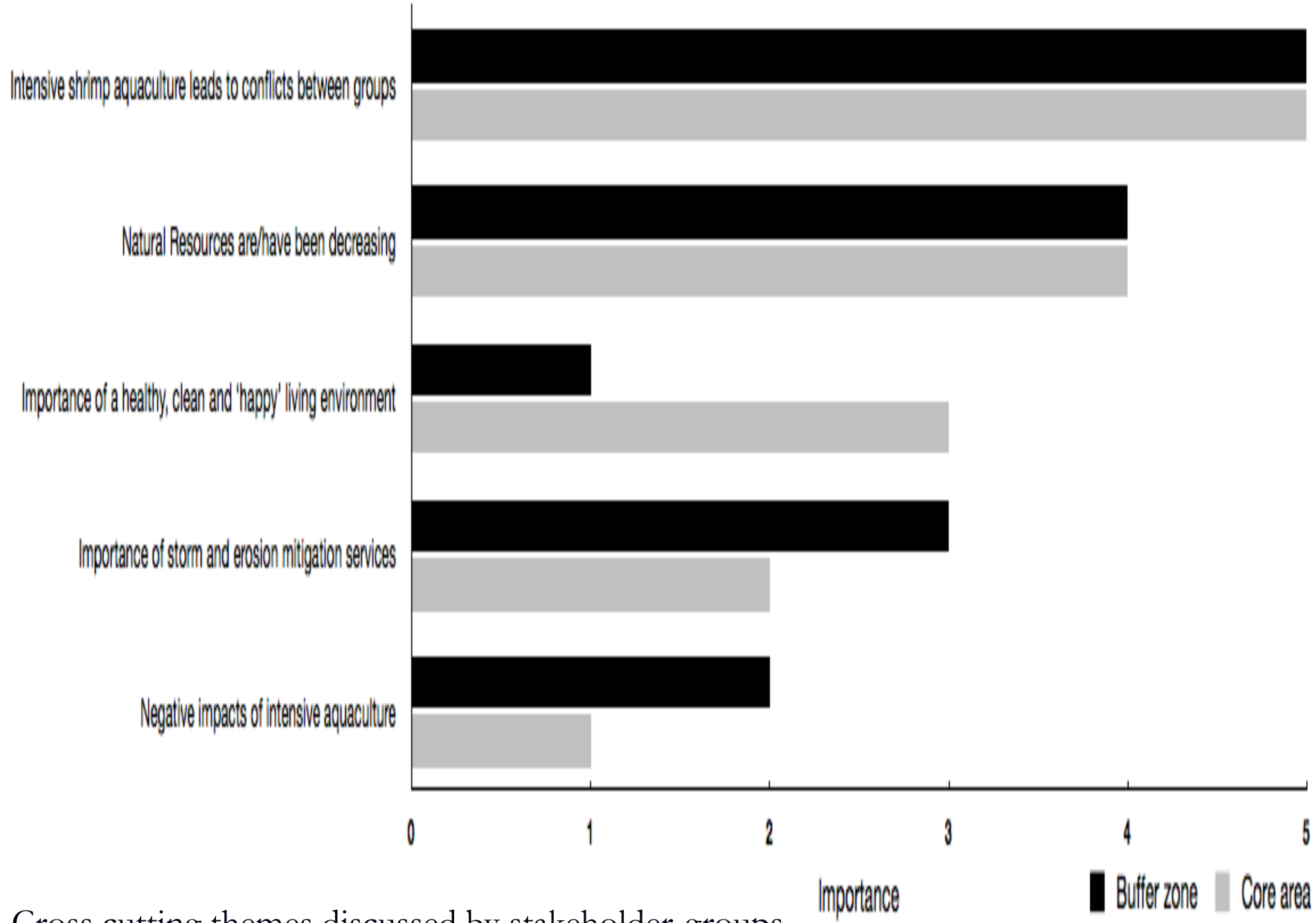
Thanh Phu resources plannning



Can Gio preference choice discussions



Scenario preferences (%) pre (full line) and post-intervention (dashed line) for core area stakeholder-groups.



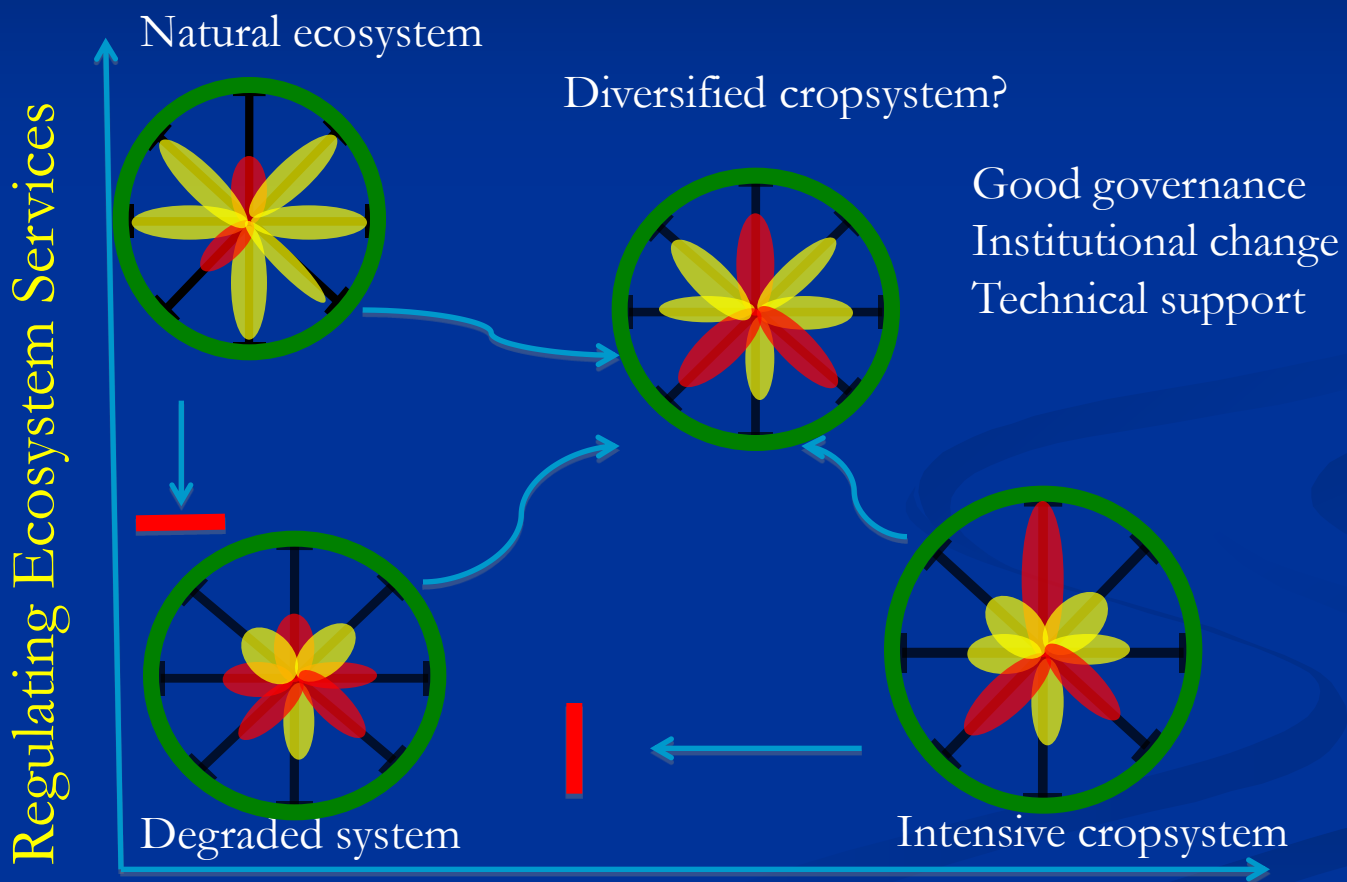
Cross cutting themes discussed by stakeholder-groups

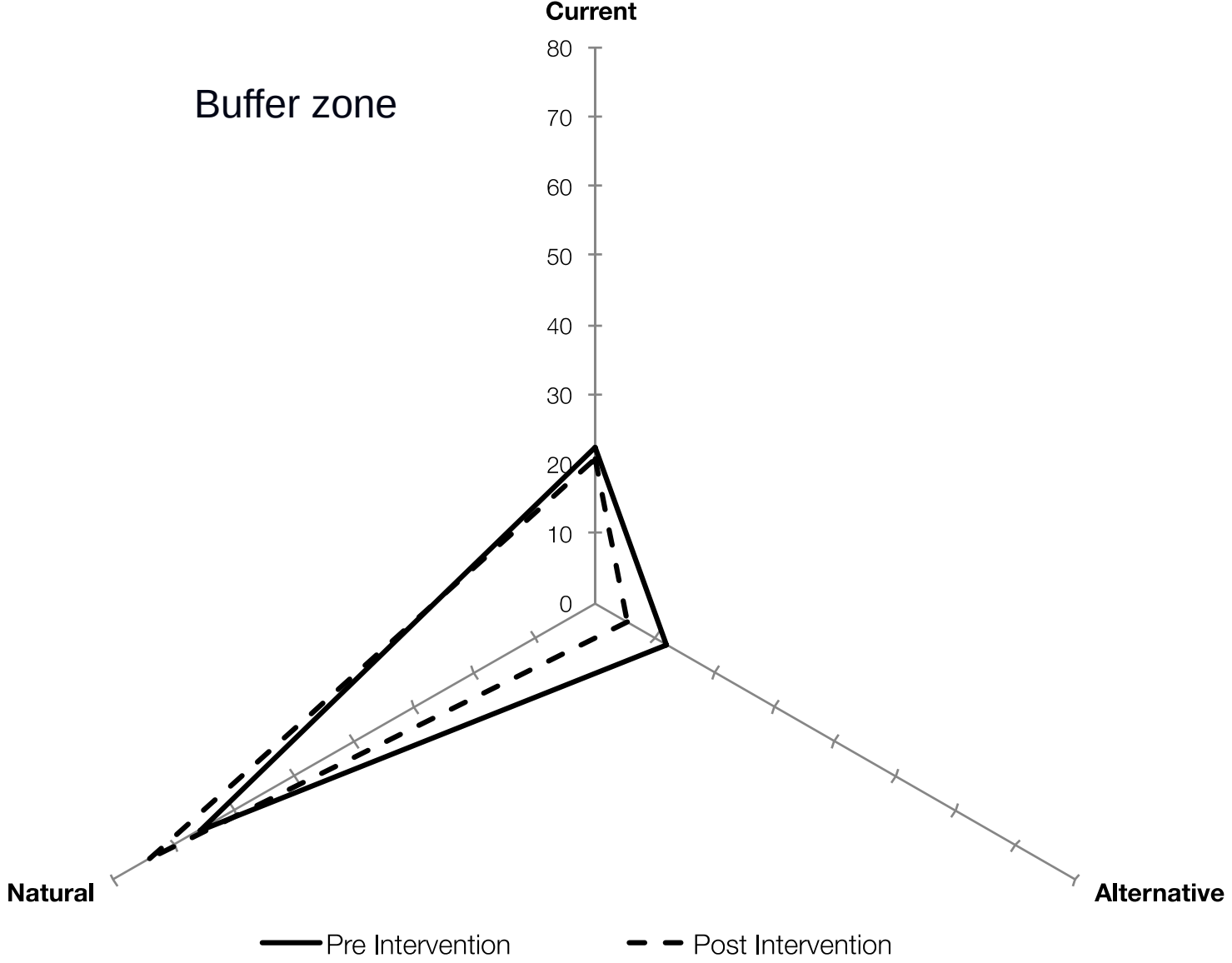
Ongoing Projects and partners

- Sustainable management of ecosystem services for long term aquaculture production in the Mekong Delta. Nong Lam & An Giang univ. WWF, AIT.
- Mainstreaming an ecosystem based approach to climate change into biodiversity conservation planning in Vietnam. BCA (MONRE), WWF.
- Life under a new Climate: preparing rural livelihoods through ecosystem based adaptation at Lang Sen Wetland Reserve. WWF

Thank You!

How to optimize ES bundles and limit trade offs?





Scenario preferences (%) pre (full line) and post-intervention (dashed line) for core area stakeholder-groups.

Ecosystem services of

Wetlands/paddy fields

Ecosystem services	Livelihoods
Water storage	Rice, crop farming
Fish	Fisheries and freshwater aquaculture
Sediment deposition / accumulation	Rice, crop farming
Nutrition	Rice, crop farming
Recharge groundwater	Supply of fresh water

Ecosystem Services of ***River, stream***

Ecosystem services	Livelihoods
Sediment transportation	Sand mining
Spawning, nursing grounds	Fishing
Migratory routes	Fishing
Waterway	Transport
Fresh water	Water supply for aquaculture, agriculture and living

Ecosystem Services of Sand dune

Ecosystem services	Livelihoods
Sand dune, silt	crop farming (watermelon, peanut, cassava), Breeding
Coastal protection	
Freshwater storage	Water supply for living, agricultural
Shelter	

Ecosystem services of

tidal mudflat, brackishwater ponds

Ecosystem services	Livelihoods
Spawning, nursing ground of aquatic species	Fishing, breeding
Waterways	Transport
Ground, brackish water	Aquaculture (shrimp, crab, fish, oyster), salt
Sediment accumulation	

Ecosystem Services of **Mangrove**

Ecosystem services	Livelihoods
Against wind storms, anti-erosion	
Coastal protection	
Habitat of shrimps, crabs, fish, birds	Capture fisheries, wild seeds
Carbon Storage	
Sediment retention	
Water purification/	
Timber	Forest plantation and maintenance