

Impacts of climate change on aquaculture and fisheries



Presentation outline

- Introduction: ICAFIS
- Fisheries sector in Vietnam
- Climate Change impacts, policies and initiatives in Vietnam
- Developing a project to address CC adaptive activities in the fisheries sector

ICAFIS

- Registered (March 2010) as a non-profit org. but with strong links with the Government
- Sustainability arm of the Vietnam Fisheries Society (VINAFIS)
 - >800 local branches
 - 34,000 members (farmers/fishers)
- Global focus, capacity building, research....



The aquaculture sector in Vietnam

Production

- 2,671,800 Tonnes (FAO)2010

Consumption

- Apparent per-capita 17.2 kg/year

Employment

- Livelihood for > half million people

Inland fisheries in the Delta

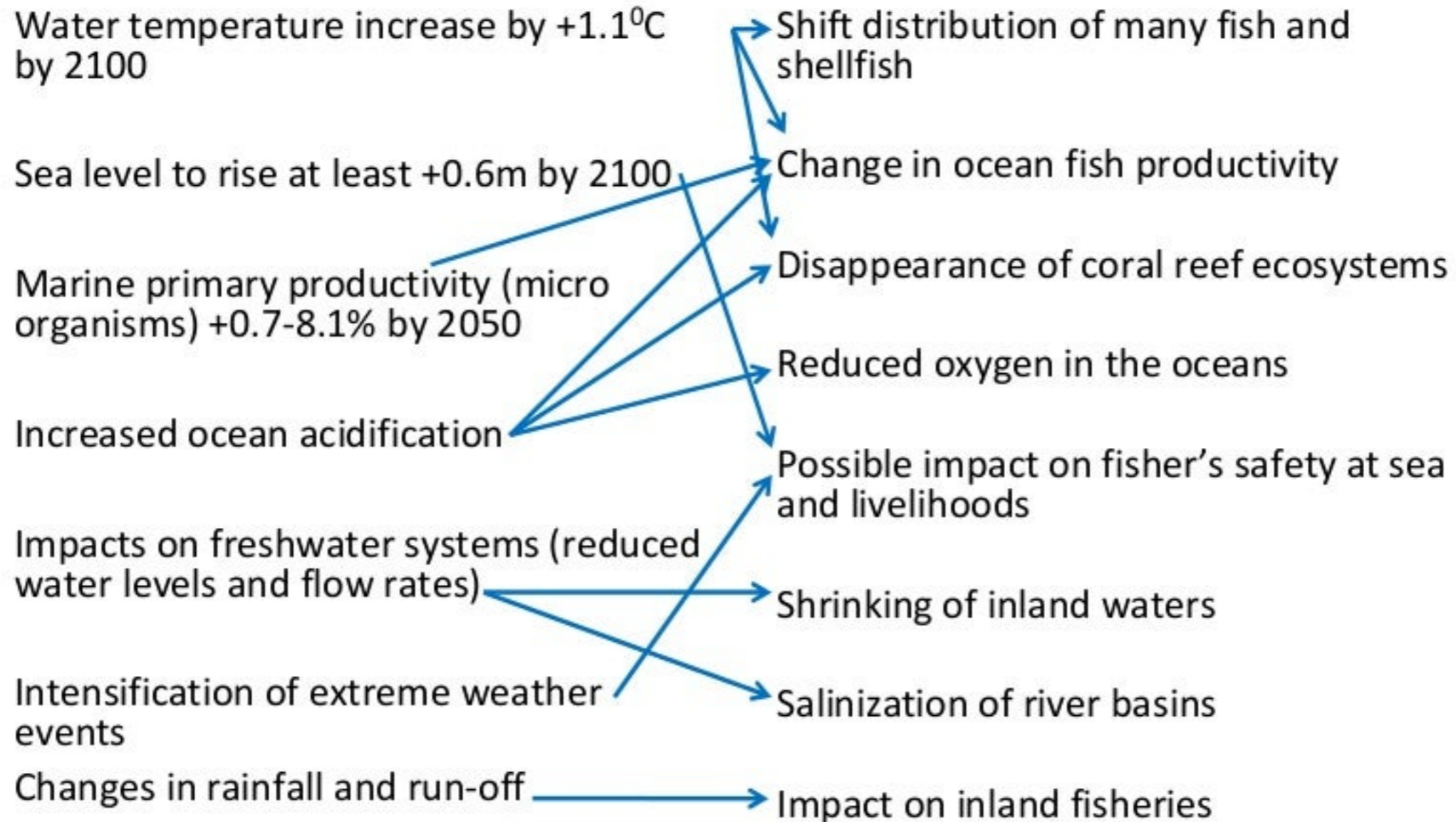
- 40% to the country's inland capture fisheries nearly 850,000 t/yr (based on consump. est.)
- The bulk of it being from the floodplains of the Delta
- Fishery mainly artisanal and more intense in the flood period (seasonality)
- Mainly non-mainstream
- Livelihoods, food security, generating revenue
- Used also for aquaculture (feed)
- Impact from CC very difficult to predict

Climate Change: What impact?

1. Temperature increase of +1.1⁰C by 2100
2. Increase average sea surface temperature
3. Sea level rise at least +0.6m by 2100
4. Marine primary productivity +0.7-8.1% by 2050
5. Increase ocean acidification due to CO₂
6. Impacts on freshwater systems (reduced water levels and flow rates)
7. Increase in water run-off
8. Intensification extreme weather events (floods, typhoons)

(IPCC, 2007; Nicholls *et al.*, 2007; FAO, 2009; Nellesmann *et al.*, 2009)

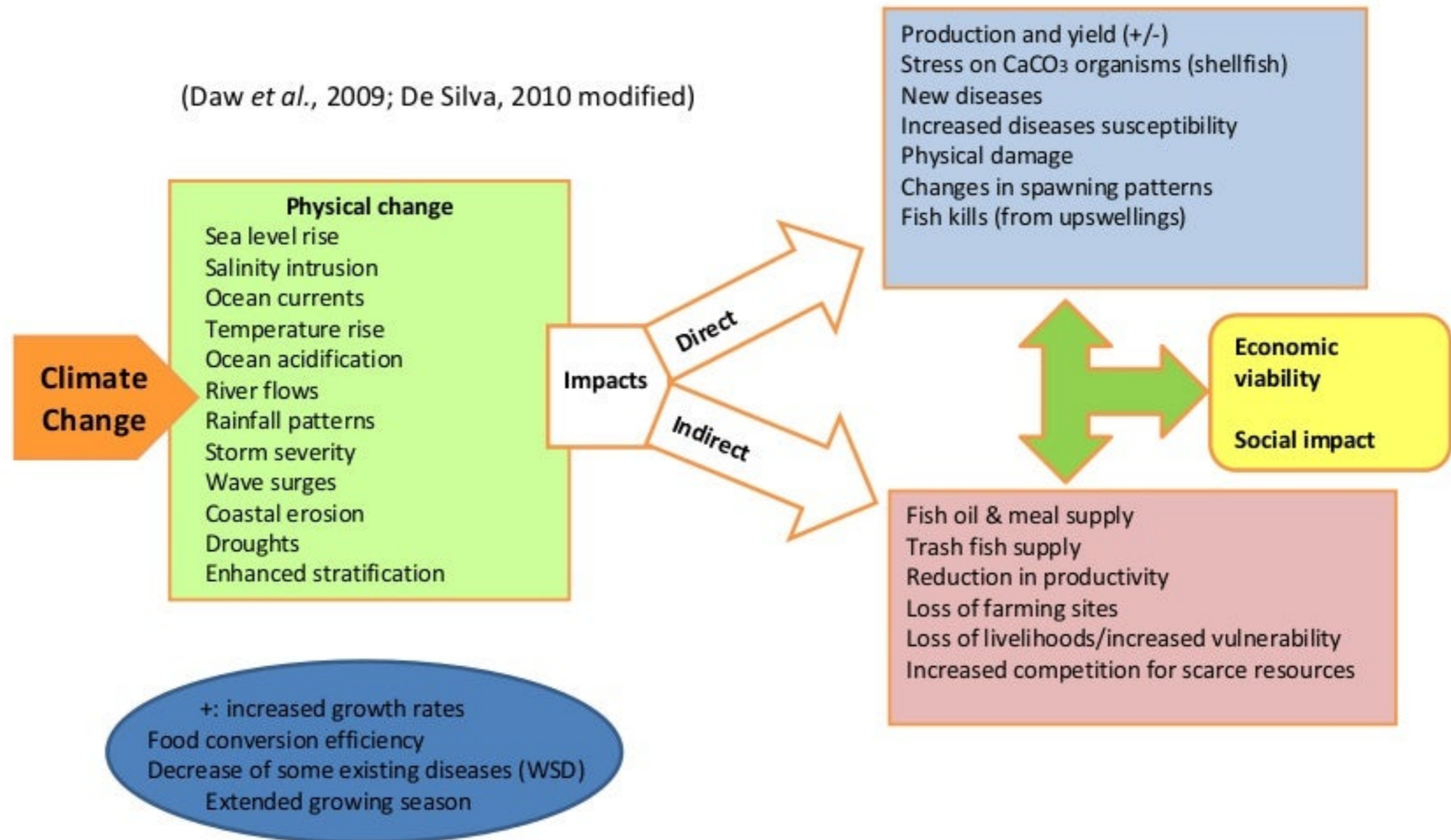
The impact of CC on fisheries



(IPCC, 2007; Nicholls et al., 2007; FAO, 2009; Nellemann et al., 2009; SPC, 2008; Daw et al., 2009)

The impacts of CC on aquaculture

(Daw *et al.*, 2009; De Silva, 2010 modified)



F/A impacts on CC

F/A make a minor, but still significant contribution to global greenhouse gas (GHG) emissions throughout the sectors' supply chain

(FAO, 2009)

Fisheries

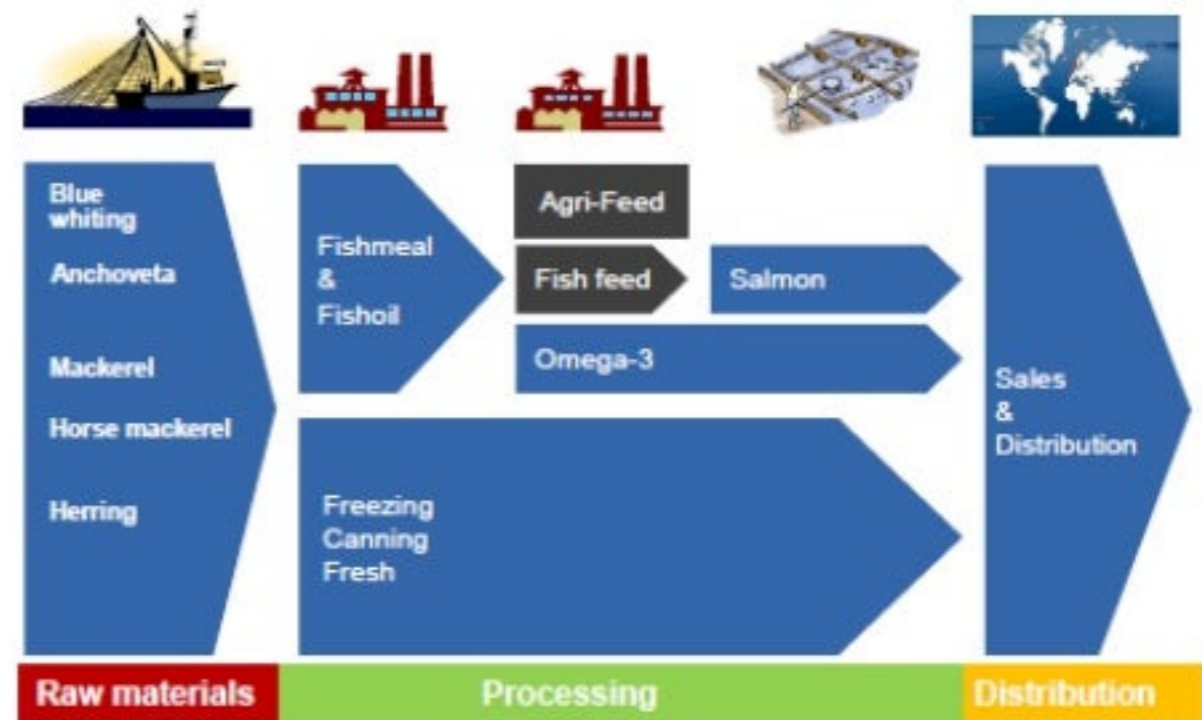
- Fuel inefficient fishing methods
- Emissions associated with trading products worldwide, including air freight and shipping

Aquaculture

- Carbon footprint is lower than other farm-raised protein industry e.g. livestock
- LCA: shrimp farming produces 11,10 kg CO₂/kg
- Tilapia, carps, bivalves – 1.67, 0.80, 0.01 kg CO₂/kg

(Davies, 2010)

Value Chain



Economic impact

Capture fisheries

- Global annual loss in landed value between US\$ 17 and 41 bln (World Bank, 2010)
- Mostly in LDCs countries (Allison et al, 2009)

Aquaculture

- No global data
- Vietnam with +1m slr scenario:
 - 11% of the population affected especially in Mekong and Red River Deltas
 - impact on 7% of agriculture land
 - reduce GDP by 10%
 - Pangasius industry reduction in margins US\$ 145,000/ha by 2020
 - Shrimp profit fall by US\$ 6,500/ha in 2020, and by US\$ 47,500/ha in 2050

(Dasgupta et al, 2007, Kam et al, 2010)