



Barriers to Aquaculture Development as a Pathway to Poverty Alleviation and Food Security:

Policy Coherence and the Roles and Responsibilities of
Development Agencies

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UN Millennium Development Goals

Keep the promise
Millennium Development Goals



1

Eradicate extreme poverty and hunger

2

Achieve universal primary education

3

Promote gender equality and empower women

4

Reduce child mortality

5

Improve maternal health

6

Combat HIV/AIDS, malaria and other diseases

7

Ensure environmental sustainability

8

Develop a global partnership for development



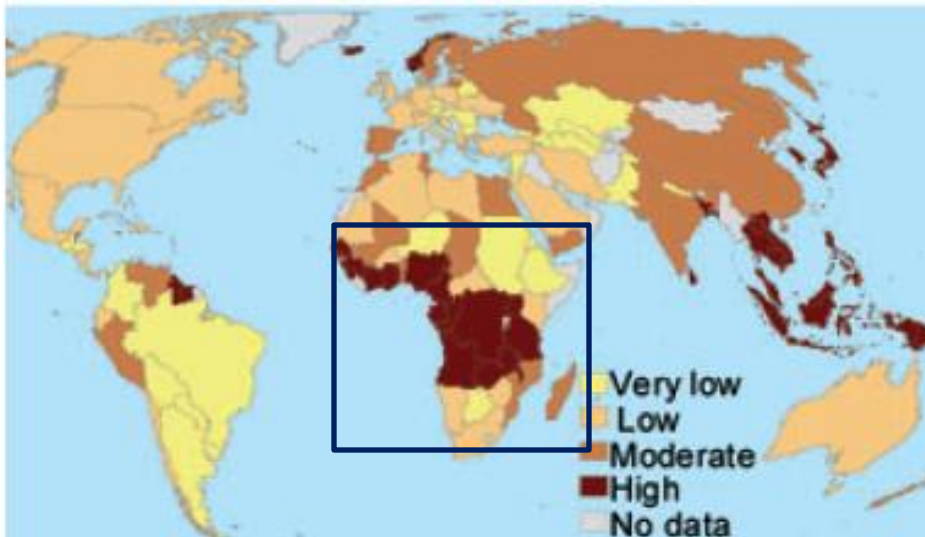
e.g. fish and food security



- an important source of nutrition for 2.6 billion, mostly poor, people
 - protein and energy
 - vitamins, minerals, EFAs
 - ‘.. rich food for poor people..’

- **e.g. sub-Saharan Africa**

- > 400 million people depend on fish for most of their animal protein intake
- fish consumption is the lowest in the world
- **1.6 million t** more fish needed by 2016 to maintain consumption



Global fish protein consumption as a proportion of animal protein in national diets. *source: Allison et al. (2009)*

is aquaculture a good use of resources?

seaweed farming, Tanzania



- can produce more protein and \$\$ per drop of water than other crops
- can be ecologically efficient
 - aquatic herbivores/omnivores
 - integration with agriculture increases ‘crop per drop’



tilapia, Malaysia

- can maintain /provide **or** consume ecosystem services
- determined by species, system, intensity of production methods



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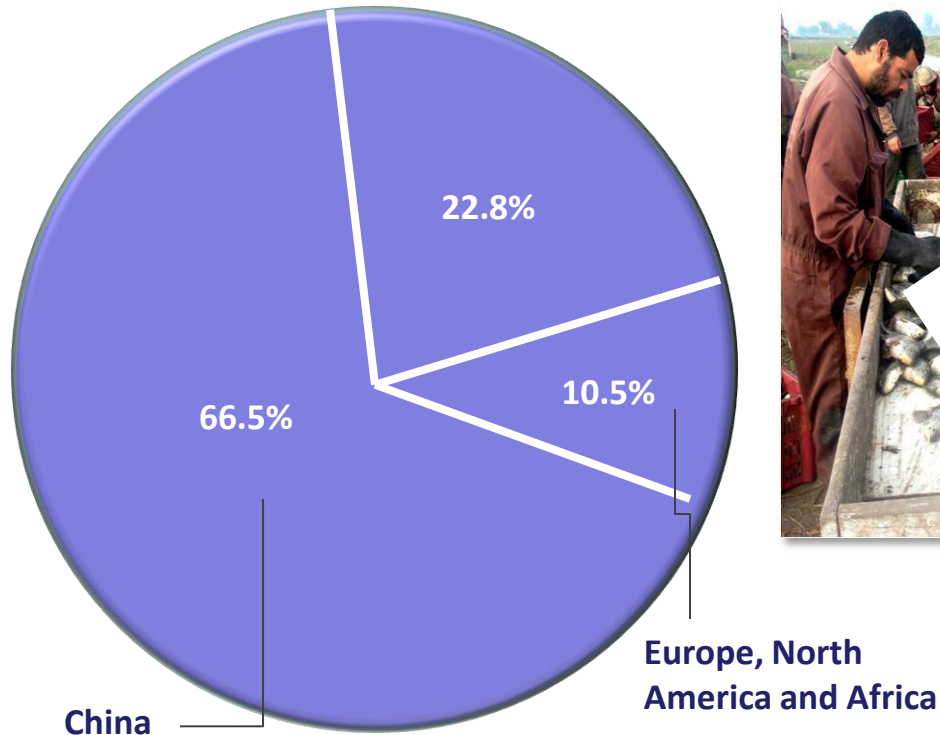
- two key questions
 - how - and under what conditions - can aquaculture make substantive improvements to livelihoods, foster economic growth and improve food security without compromising ecosystem services?
 - what are the policy barriers to achieving this and how can they be addressed?

aquaculture in the developing world

aquaculture – a global picture

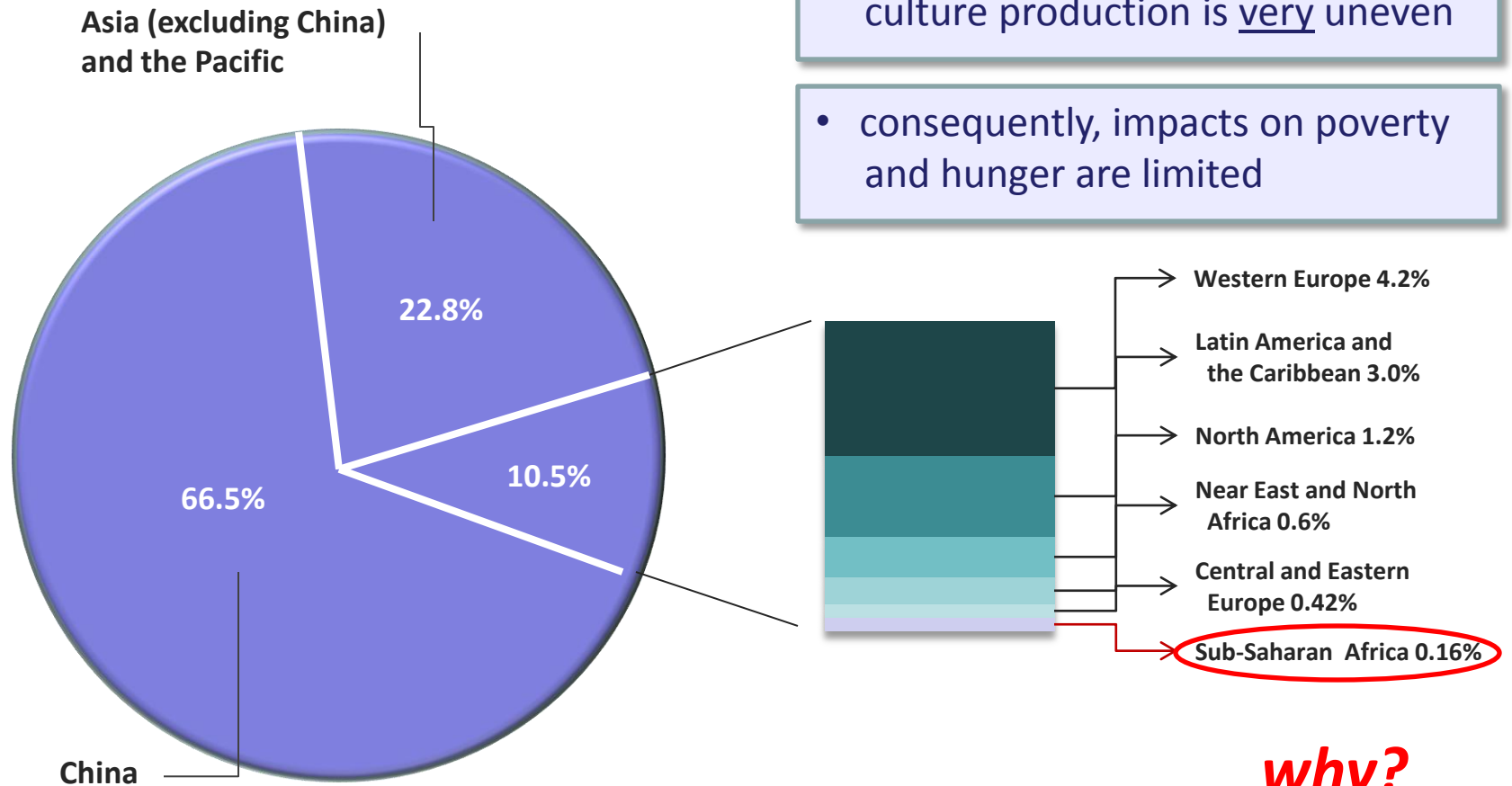
Aquaculture production by region, 2006

Asia (excluding China)
and the Pacific



aquaculture – a global picture

Aquaculture production by region, 2006

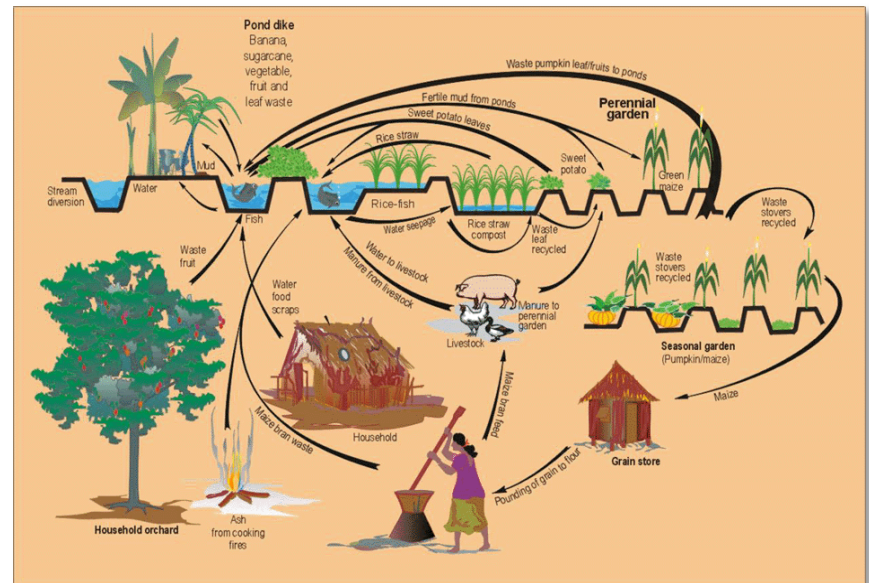


aquaculture, poverty
and food insecurity

aquaculture development focus



- historical development focus by development agencies on poor smallholders
- appropriate land, water, soils, etc.



smallholders, Bangladesh



- 5 year, USAID project (DSAP)
- beneficiaries
 - 68,400+ farmers
- food security
 - > 8200 tonnes
- household-level benefits
 - production: 1542 → 3046 kg per ha
 - fish income: \$1130 → \$2200 per ha
 - total farm income: 13% → 17%
 - fish consumption: 46 → 58 g per person per day
 - empowered women

conclusions - *Bangladesh*



- 1988: 338,000 tonnes
- 2007: 1,613,000 tonnes } 400%
- two thirds of total fish supplies
- most from poor smallholders
- *how?*
 - pond area (land and water)
 - productivity increases

smallholders, Malawi



- **20 year** multi-partner engagement
- increase from **300** → **7000** farms
- farm productivity improved by **10%**
- income per ha increased by **134%**
- total farm income increased by **61%**
- per capita consumption of fresh (**208%**) and dried fish (**21%**) increased
- improved nitrogen use efficiency
- greater resilience to drought

conclusions - *Malawi*



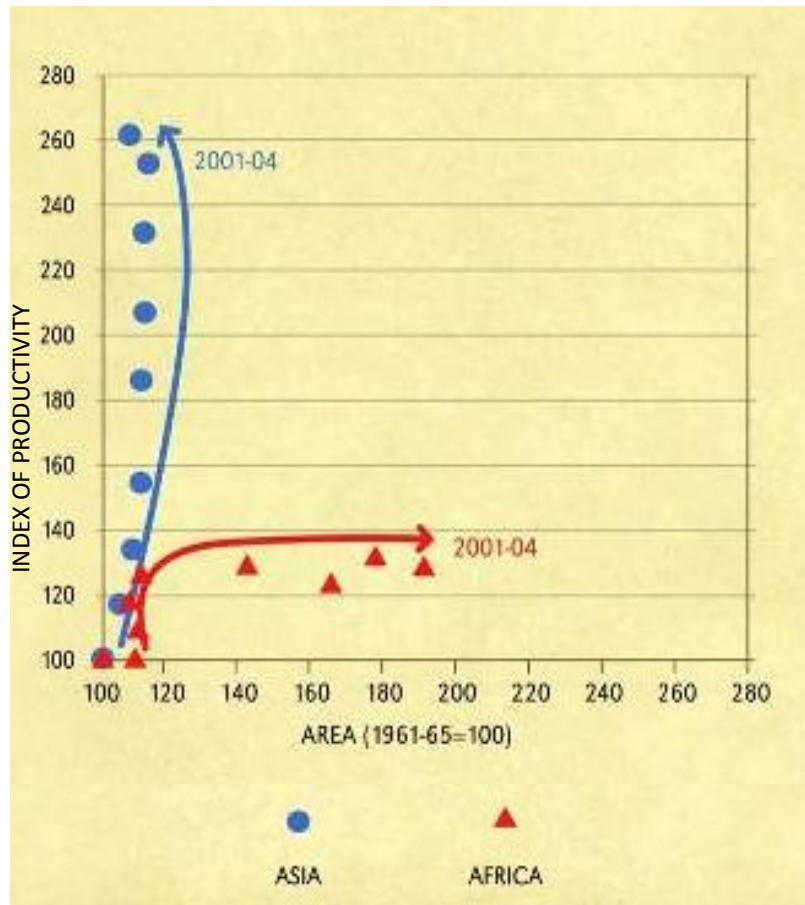
- benefits smallholders, communities
 - improves total farm productivity
 - improves resilience to shocks

but

- modest impacts on food security

Year	Annual per capita fish consumption	Aquaculture production
1986	10 kg	188 t
2006	6 kg	1500 t
2011	10 kg?	60,000 t

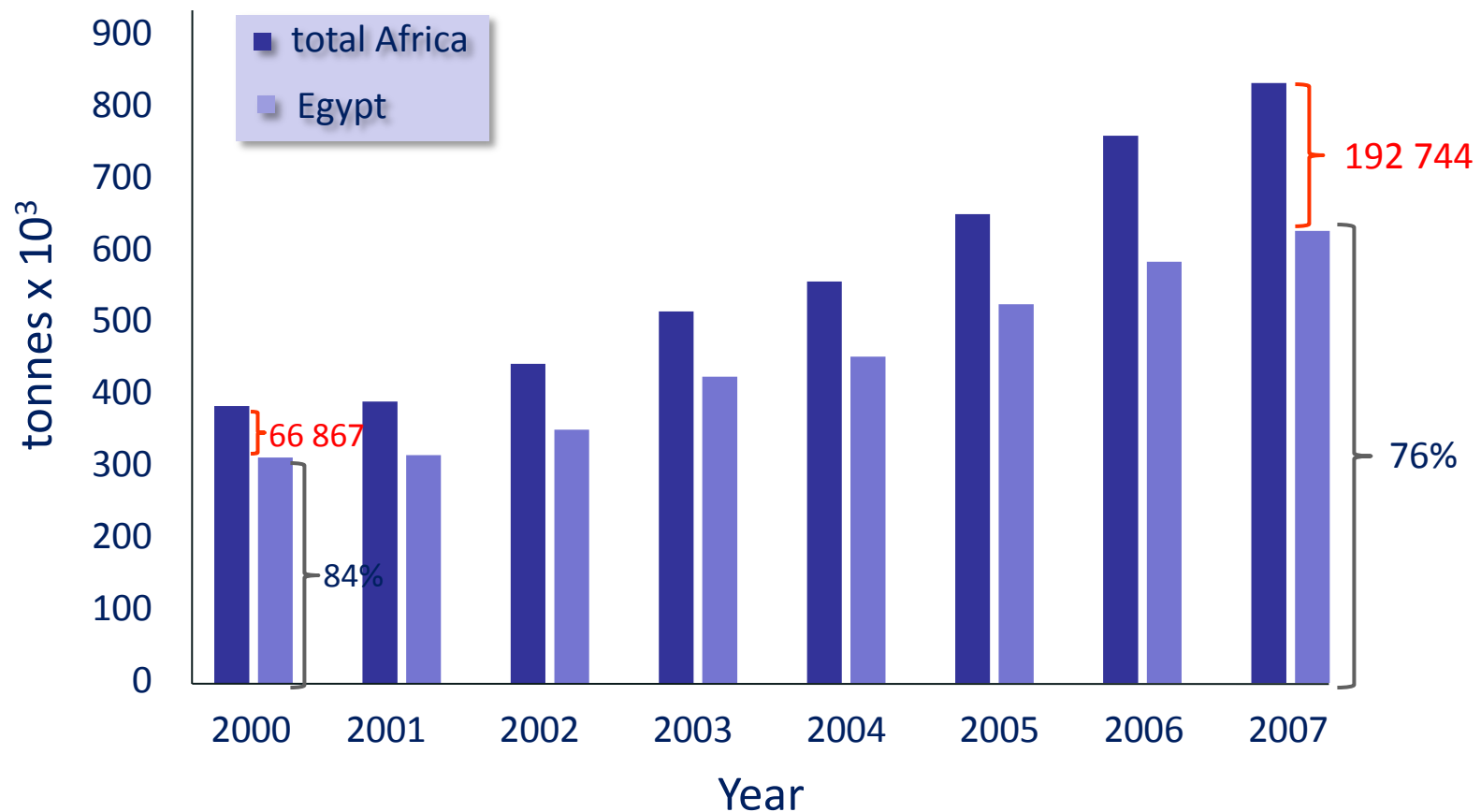
why the regional differences?



source: Devarajan, World Bank, 2009

- **Asia:** agricultural production has increased a lot
 - largely through improved productivity
- **Africa:** agricultural production cannot now feed the people
 - expansion of agricultural land, but with little increase in productivity
- also differences in population density, markets, aquaculture traditions

African aquaculture has started GROWING



source: FAO Fishstat

top ten producers - *quantities and growth*

	Top ten producers in terms of quantity, 2006			Top ten producers in terms of growth, 2004–06 ¹			
	2004 (Tonnes)	2006 (Tonnes)	APR (Percentage)	2004 (Tonnes)	2006 (Tonnes)	APR (Percentage)	
China	30 614 968	34 429 122	6.05	Uganda	5 539	32 392	141.83
India	2 794 636	3 123 135	5.71	Guatemala	4 908	16 293	82.20
Viet Nam	1 198 617	1 657 727	17.60	Mozambique	446	1 174	62.24
Thailand	1 259 983	1 385 801	4.87	Malawi	733	1 500	43.05
Indonesia	1 045 051	1 292 899	11.23	Togo	1 525	3 020	40.72
Bangladesh	914 752	892 049	-1.25	Nigeria	43 950	84 578	38.72
Chile	665 421	802 410	9.81	Cambodia	20 675	34 200	28.61
Japan	776 421	733 891	-2.78	Pakistan	76 653	121 825	26.07
Norway	636 802	708 780	5.50	Singapore	5 406	8 573	25.93
Philippines	512 220	623 369	10.32	Mexico	104 354	158 642	23.30

source: SOFIA, FAO (2009)

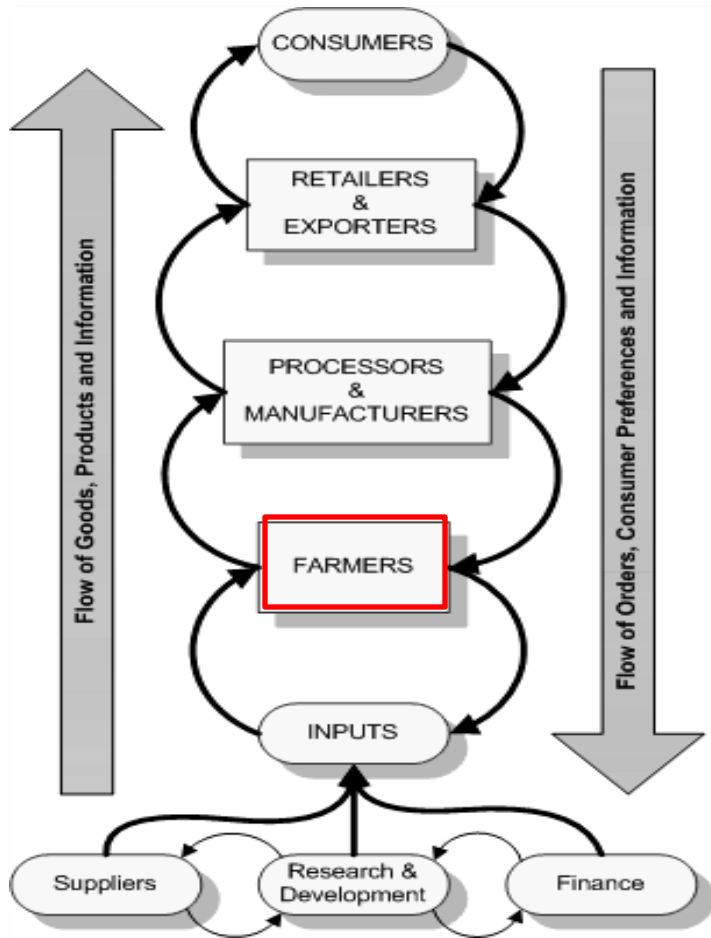
... much due to SMEs

Small-Medium Enterprise aquaculture



- a wide range of producers
- produce < 100 tonnes
- conditions for success
 - strong markets
 - access to seed, feed, credit and transport
- a focus on profits

SME aquaculture value chain



modified from DFID RIU

- impact on rural and periurban economies
- development impact created through entire value chain
 - upstream and downstream
 - value added
 - employment: 2-3 fold
 - women
 - socially marginalized

EC Adivasi project, Bangladesh 2007-09



Adivasi people, Bangladesh

Activity	Adivasi households	
production	fish culture in ponds/ditches	1238
	fish culture in rice fields	527
up/downstream	fingerling production in cages in pond/canal	488
	fingerling trading	154
	food fish trading	403
	fish harvesting team member	743
	habitat restoration	41
total	3594	

source: Benoy Barman

conclusions and
recommendations

aquaculture and development



- aquaculture is becoming the most important source of aquatic food
- bulk of production from developing countries
 - geographically uneven
 - limited impacts on poverty and food security
- focus on poor smallholders in Africa has had limited impacts on food security and poverty
- more coherent approach to aquaculture and development

policy cohesion for development



PCD - ‘.. the pursuit of development objectives through the systematic promotion of mutually reinforcing policy actions on the part of both developed and developing countries’.

source: OECD

source: <http://www.fairpolitics.nl/europa>

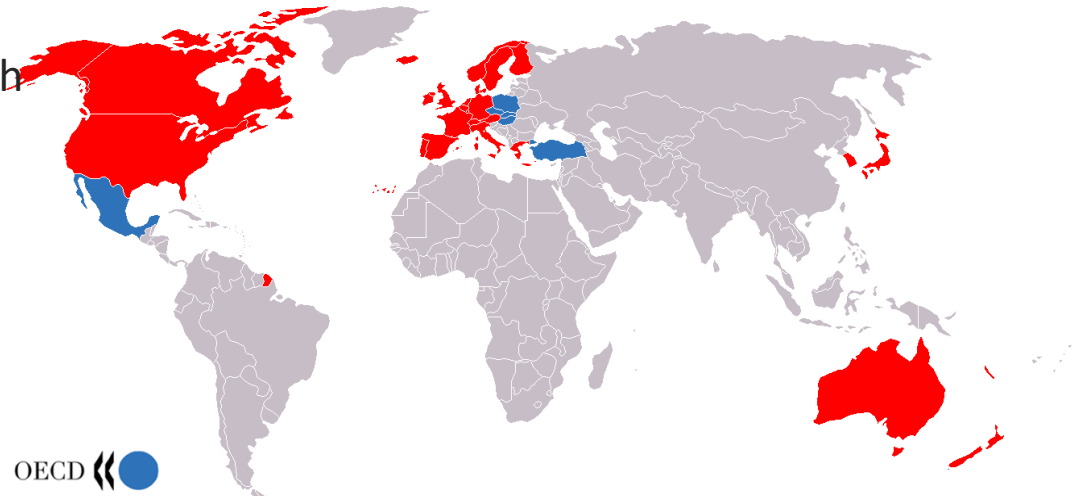
PCD - *roles of developing countries*



- is aquaculture important?
 - engage stakeholders in dialogue
 - national strategies
 - poor smallholders and poverty
 - SMEs and food security and economic growth
- create favourable investment climate
 - coherent policies across sectors
 - recognize and agree trade-offs
 - governance, transparency, anti-corruption, accountability, user rights

PCD - *roles of OECD countries*

- coherent, mutually supportive policies among sectors
 - trade
 - OECD imports 60% of its fish from developing countries (excluding fishmeal and fish oil for aquaculture)
 - food safety & public health
 - development
 - environment
 - energy



- coherence among and within donor agencies

PCD – *roles of development agencies*



- understand
 - costs and benefits from different types of aquaculture development
 - consider entire value chain
 - location-specific economic, social, political realities in implementation
- invest in training, capacity building
 - e.g. trade
 - food safety standards - clarity, stability and assistance
- champion PCD

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