SUSTAINABILITY OF FISHERIES: THE GLOBAL CRISIS IN NUTRITION AND MENTAL ILL HEALTH:

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The Brain Evolved in the Sea 500 Million Years Ago

and is still dependent on the marine food web,

There are 5 parts to this talk.

1. Condition of existence is the greater power.
2. The special significance of dietary fats in the evolution of animals, vision and the brain.
3. The specific essentiality of marine foods in the evolution of the human brain.
4. THE GLOBAL NUTRITION CRISIS AND THE RISE IN MENTAL ILL HEALTH.
5. Solutions – Fisheries and the future.





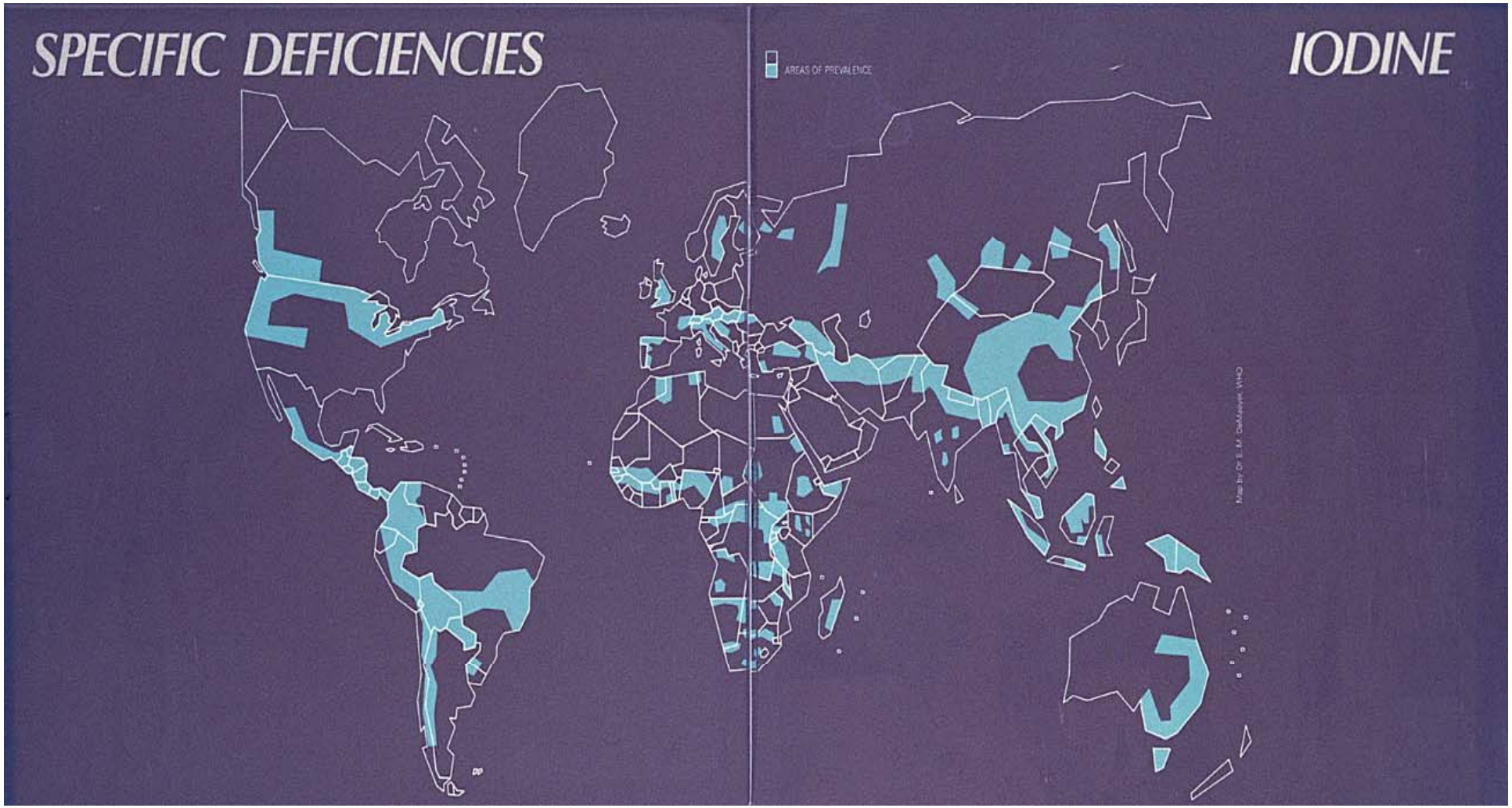


LAND'S LOSS IS THE OCEAN'S GAIN: McKinnley Estuary: Fertilising the marine food chain





WHO Map of Iodine Deficiency (& trace elements e.g Zn, Cu, Se). The 65 County Study of China revealed an inverse relationship between DHA, Zn, Se and CHD,



Iodine deficiency: Goitre in Sudan

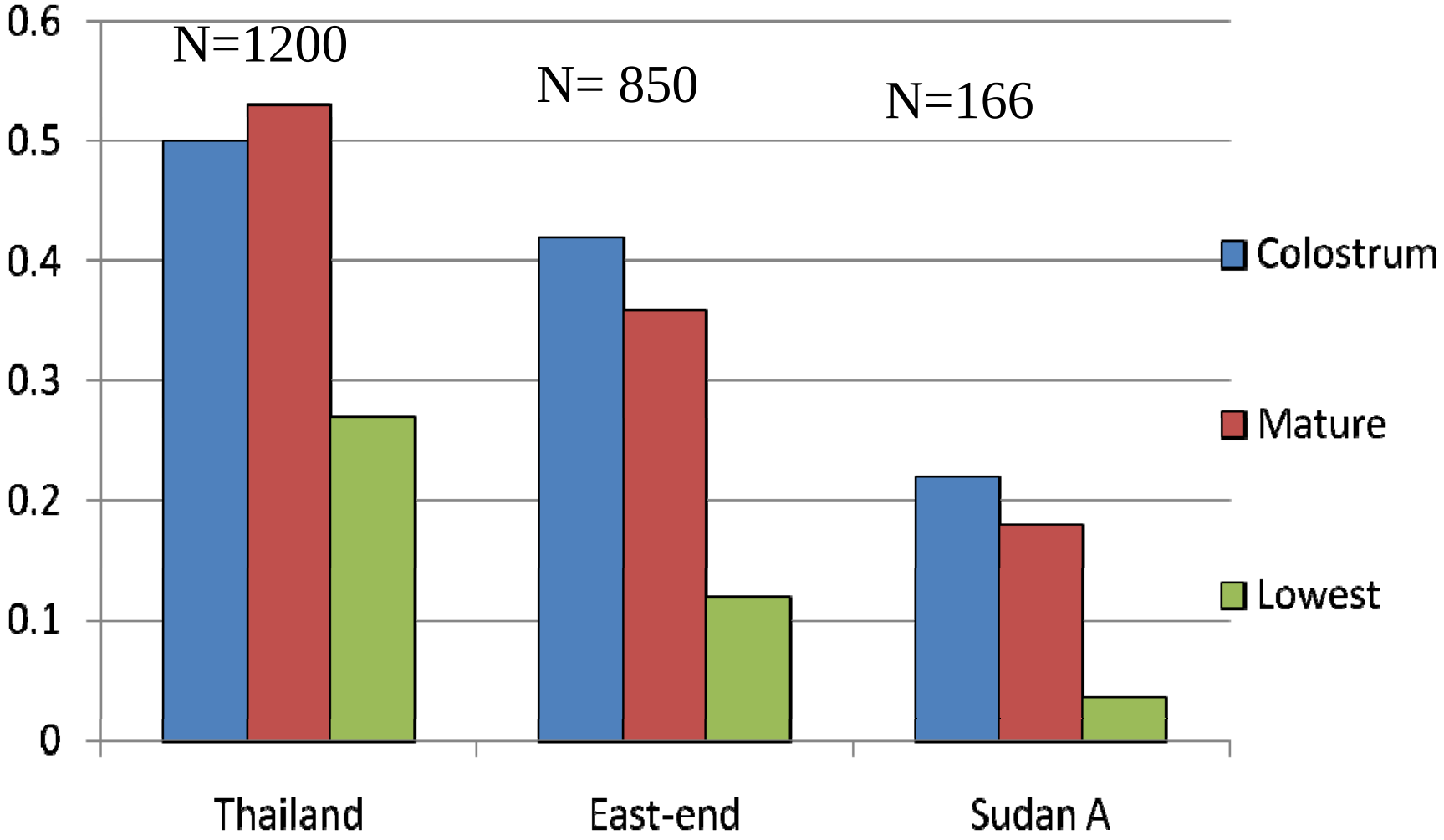
Photo – Izzeldin Hussein 2008.

2 billion currently at risk.

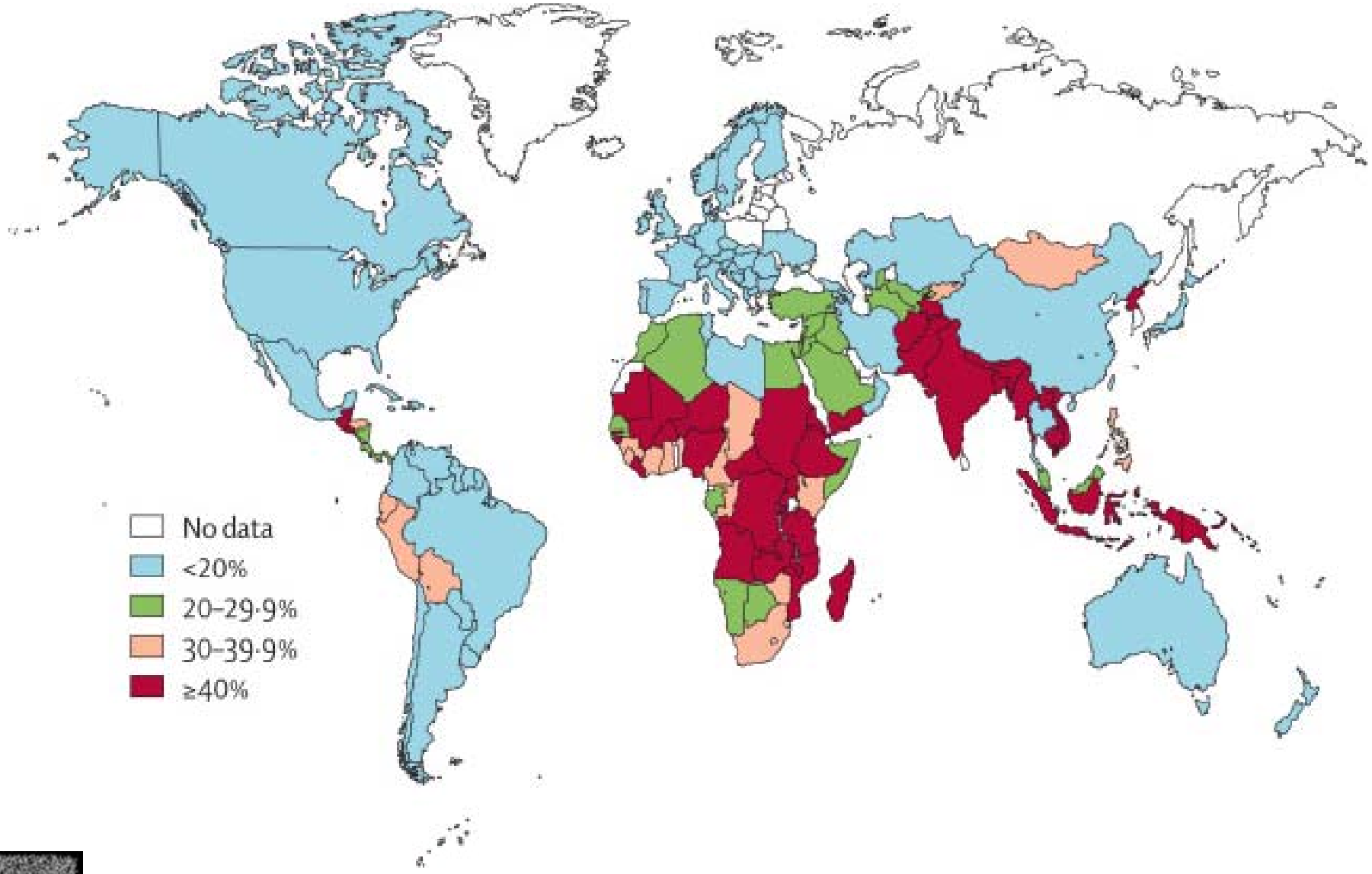




Mother's milk as an index of DHA status of mother & infant. Sudanese mothers had the lowest ω3 DHA reported. Iodine and DHA deficiency co-exist.



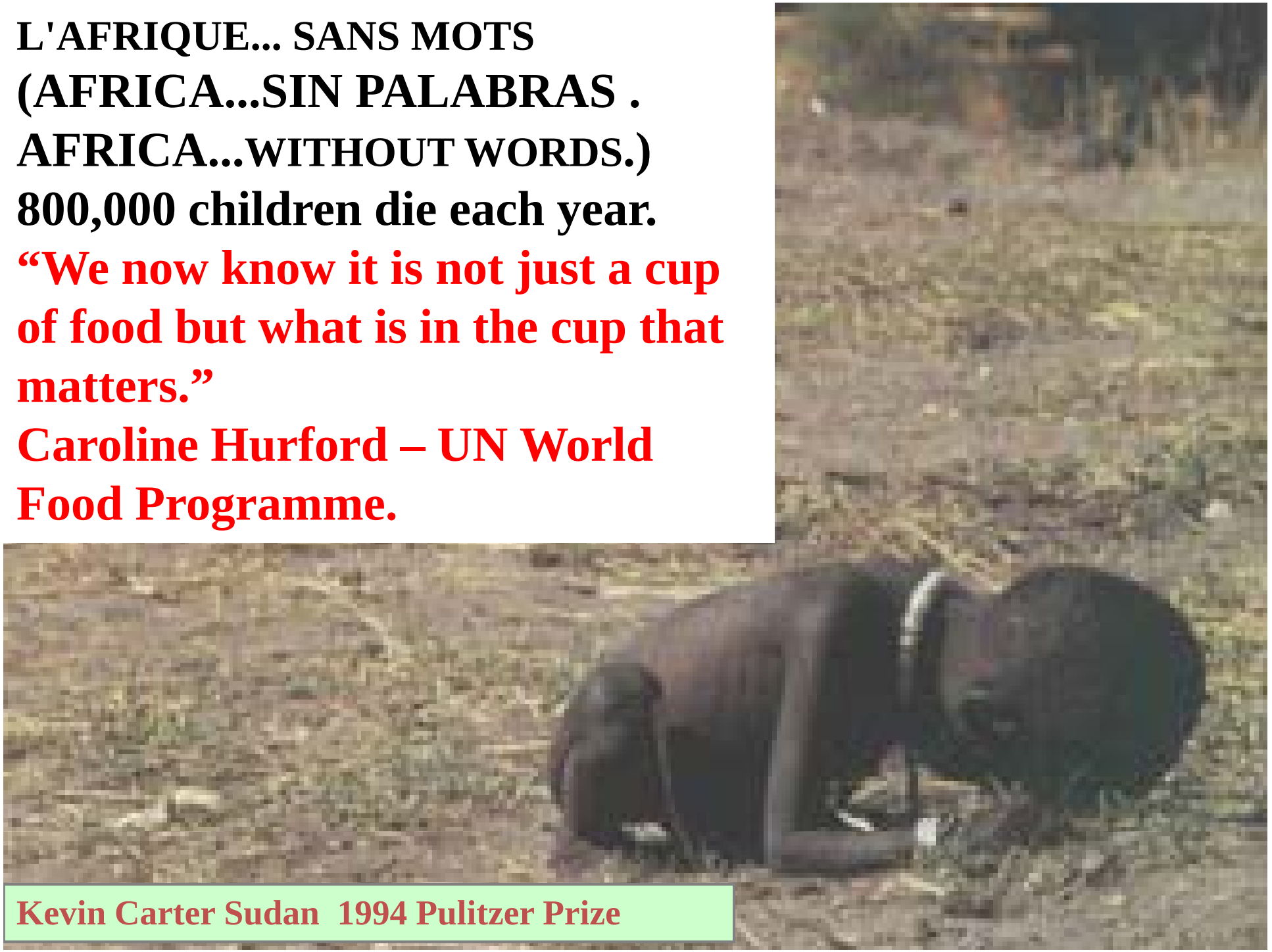
Malnutrition



The Lancet 2008; 371:243-260

Terms and Conditions

L'AFRIQUE... SANS MOTS
(AFRICA...SIN PALABRAS .
AFRICA...WITHOUT WORDS.)
800,000 children die each year.
“We now know it is not just a cup of food but what is in the cup that matters.”
Caroline Hurford – UN World Food Programme.

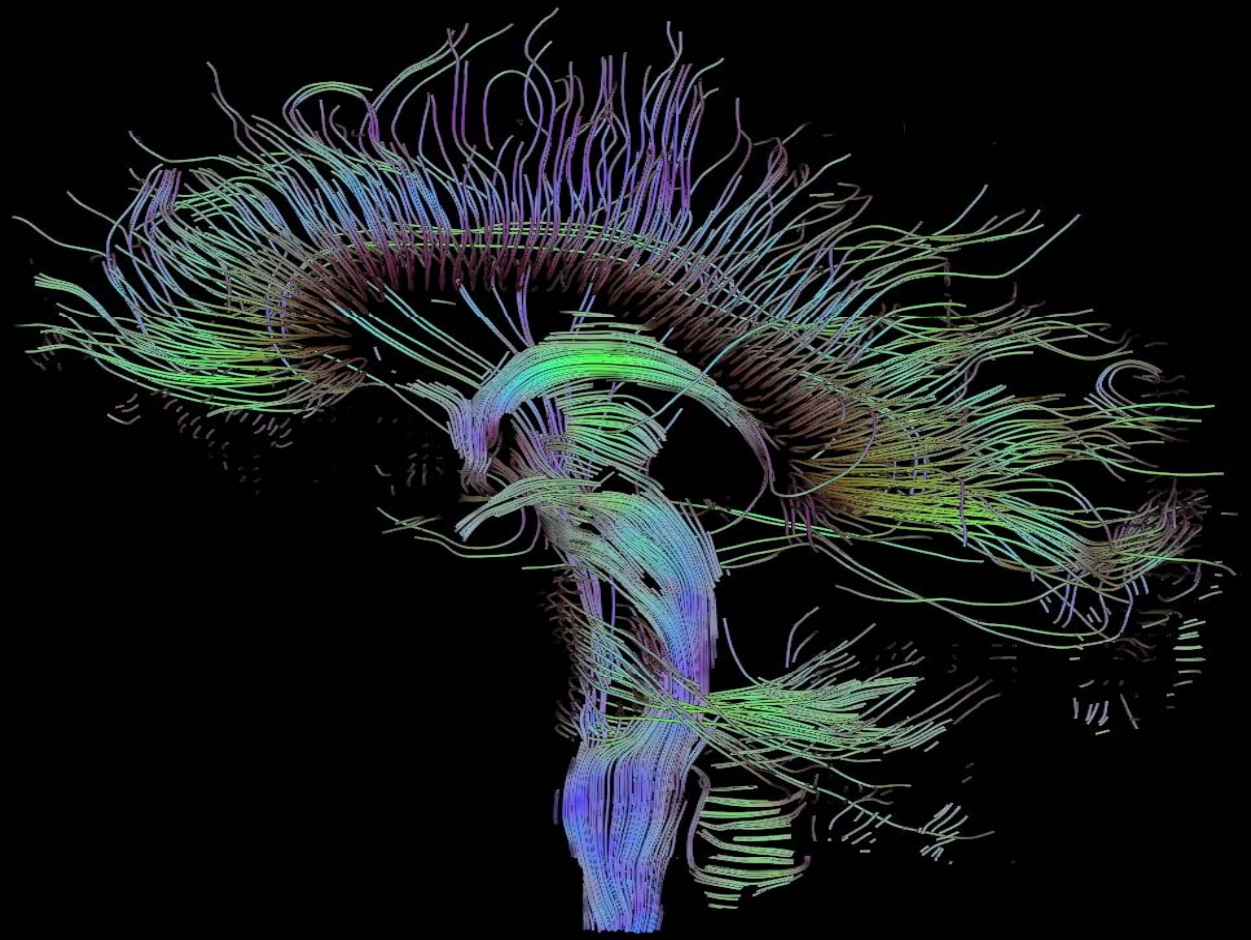


Kevin Carter Sudan 1994 Pulitzer Prize

PART II

The special significance of dietary fats in animal evolution, vision and the brain.

The brain is 60% fat: neural connections : http://en.wikipedia.org/



Docosahexaenoic (DHA) **can be made by an oxygen requiring process from α -LINOLENIC ACID in green foods but only slowly: thus little DHA on land.**

James Mead 1954, Rudolpho Brenner & Ralph Holman 1970s, Howard Sprecher, Norm Salem.

v.slow slow **AA**

18:2 ω6 ⇒ 18:3ω6 ⟹ 20:3ω6 ⇒ **20:4ω6** ⇔ **22:4ω6** ⇒ 22:5ω6

Linoleic ***Gamma-linolenic*** ⇓ ***Arachidonic***

prostaglandins & leukotrienes

seeds

v.slow

EPA slow **DHA** ⟶ Neuroprotectins

18:3ω3 ⇒ 18:4ω3 ⟹ 20:4ω3 ⇒ 20:5ω3 ⇒ **22:5ω3** **22:6 ω3**

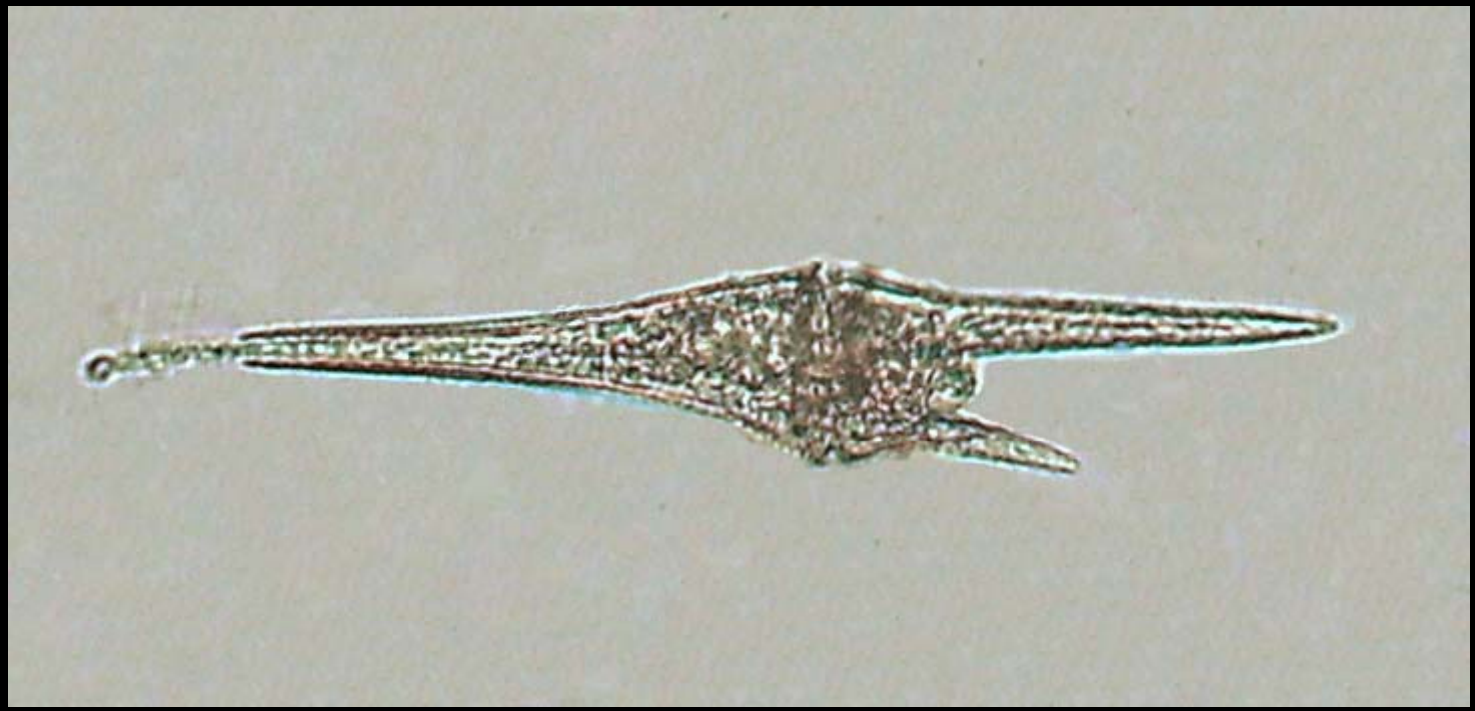
Eicosapentaenoic ⇓ ***Docosahexaenoic***

Alpha-linolenic ⇓ ⇑ **Peroxisomes**

leaves **24:5ω3** ⇒ 24:6ω3

photosynthesis v.slow

Dinoflagelate 600 mya eye spot > 50% DHA



600 MYA.

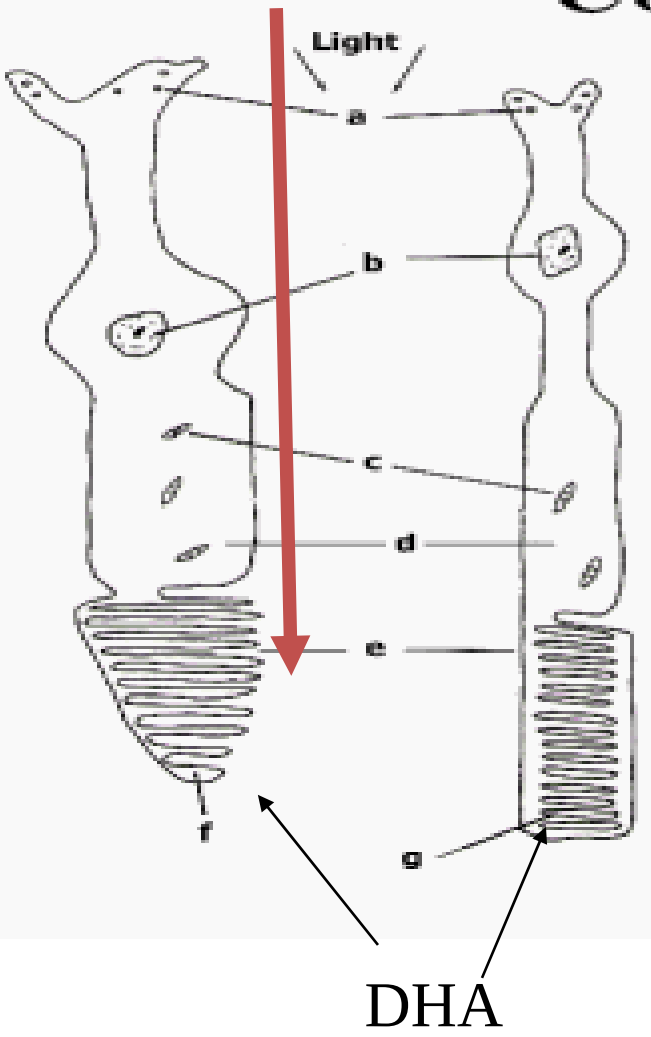
For the first 2.5 billion years of life on the planet sunlight was turned into carbohydrates and proteins.

When oxygen became available 600 mya, Nature was able to make many molecules requiring strong oxidative processes.

One of these was DHA which built the photoreceptor structures that turned photons into electricity.

That sparked the evolution of the nervous system and then the brain.

Cells in the sensory retina: Rods and Cones - IV



Current

Legend:

a: vesicle

b: nucleus

c: mitochondrion

d: inner segment

e: outer segment

f: "discs" containing iodopsin

g: discs containing rhodopsin

Turns light into electricity

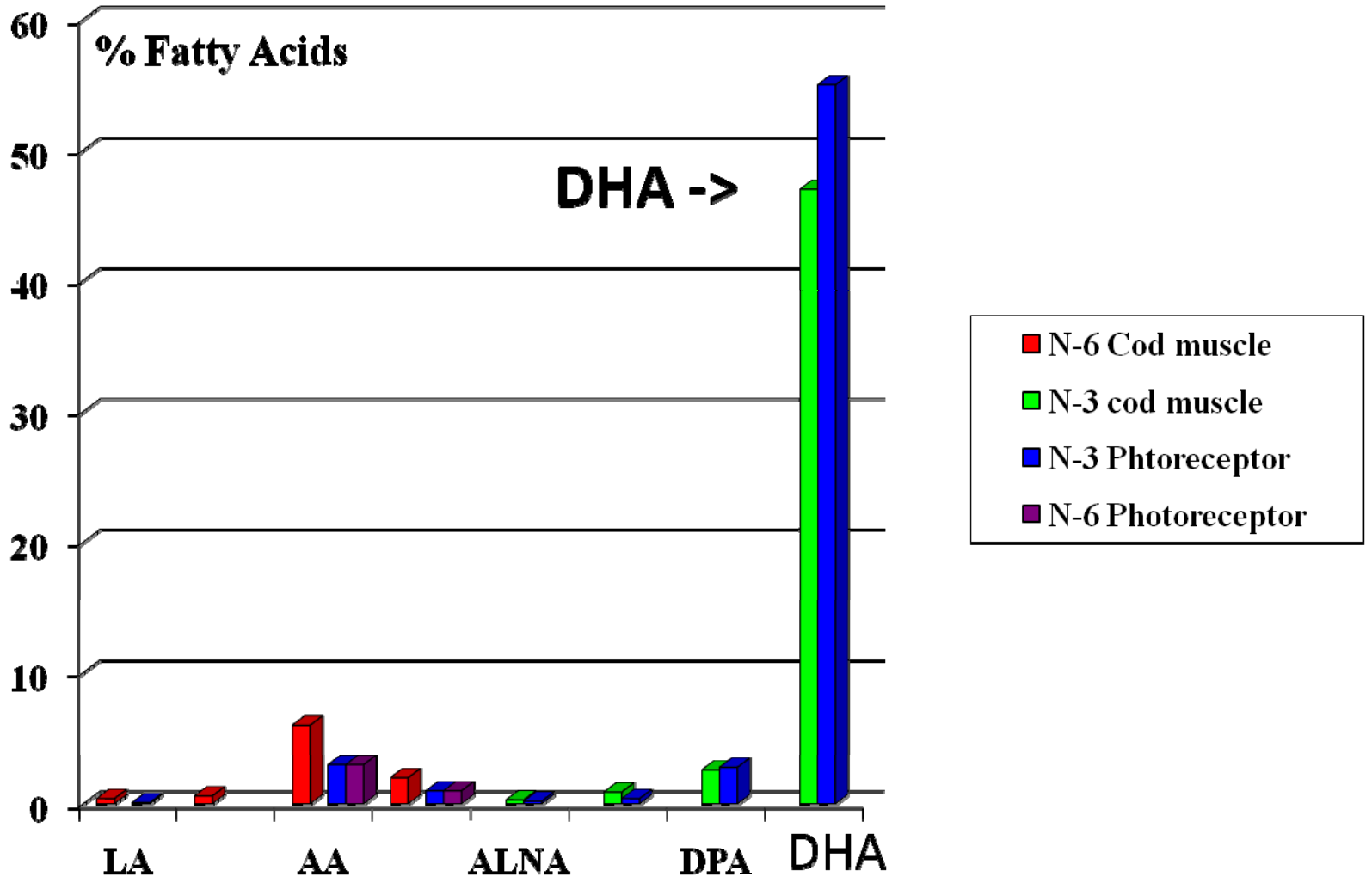
CH_3\/=\/=\/=\/=\/=\/=\/\$COOH$ **DHA**

Six oxygens are required for the six double bonds alone

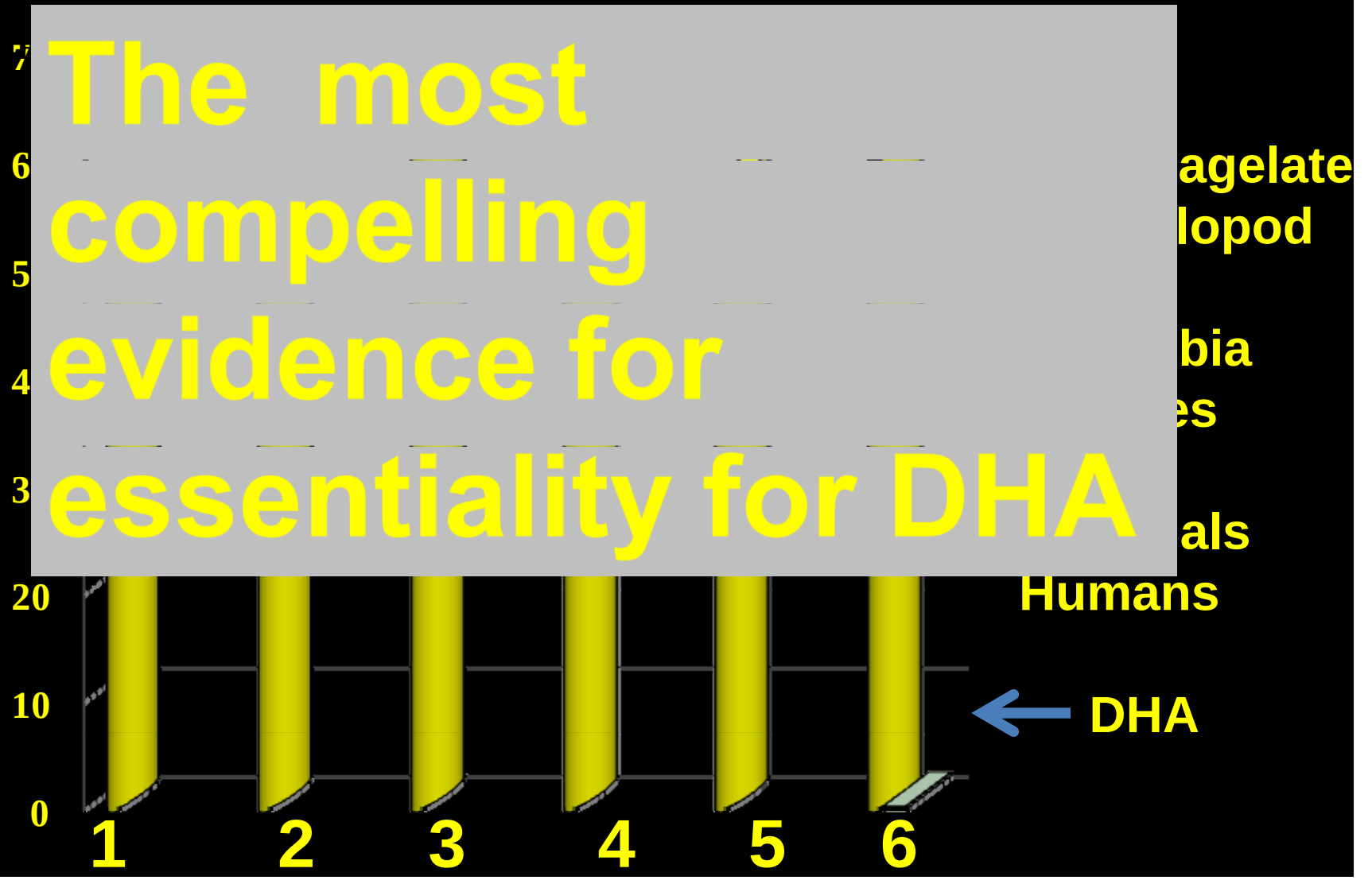
The Eye of Orthocerus from 450 million years ago



Photo-receptor Omega 3 requirement as DHA.
Ethanolamine Phosphoglycerides –
Gene Anderson & Nicholas Bazan 1968-74



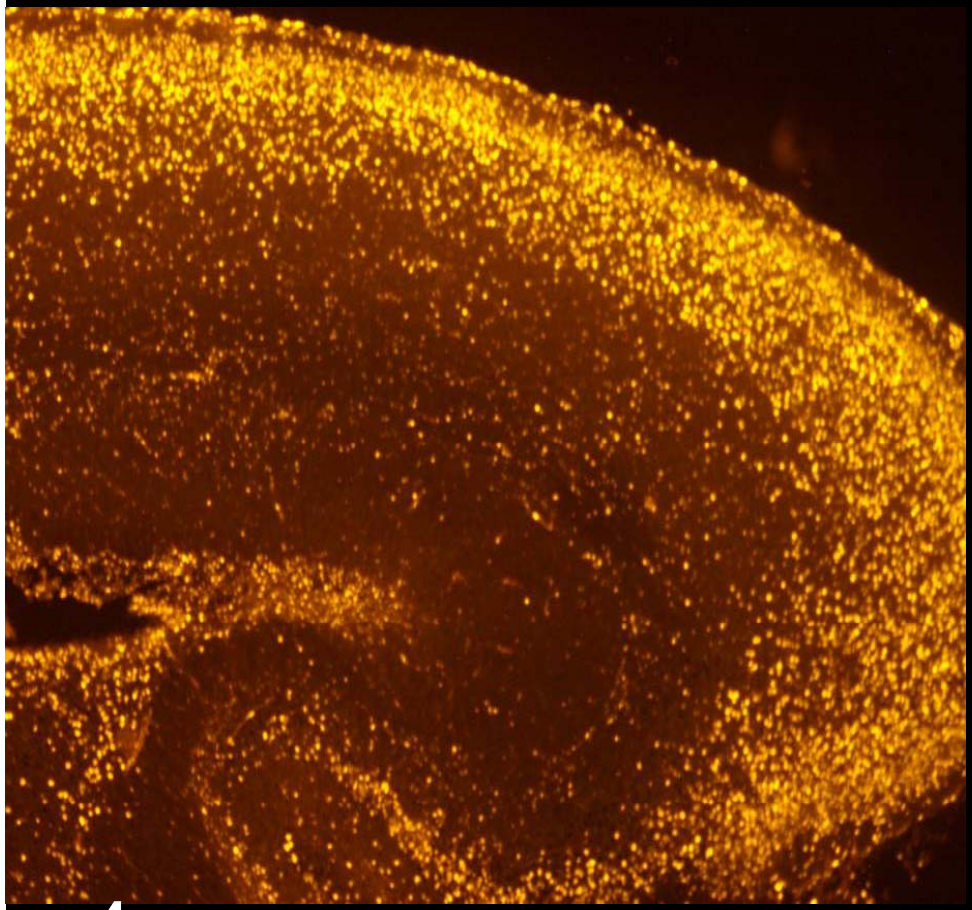
From the eye spot of the dynoflagelate to mammals, the chemistry is the same over 600 M Years of evolution (Bazan & Anderson).

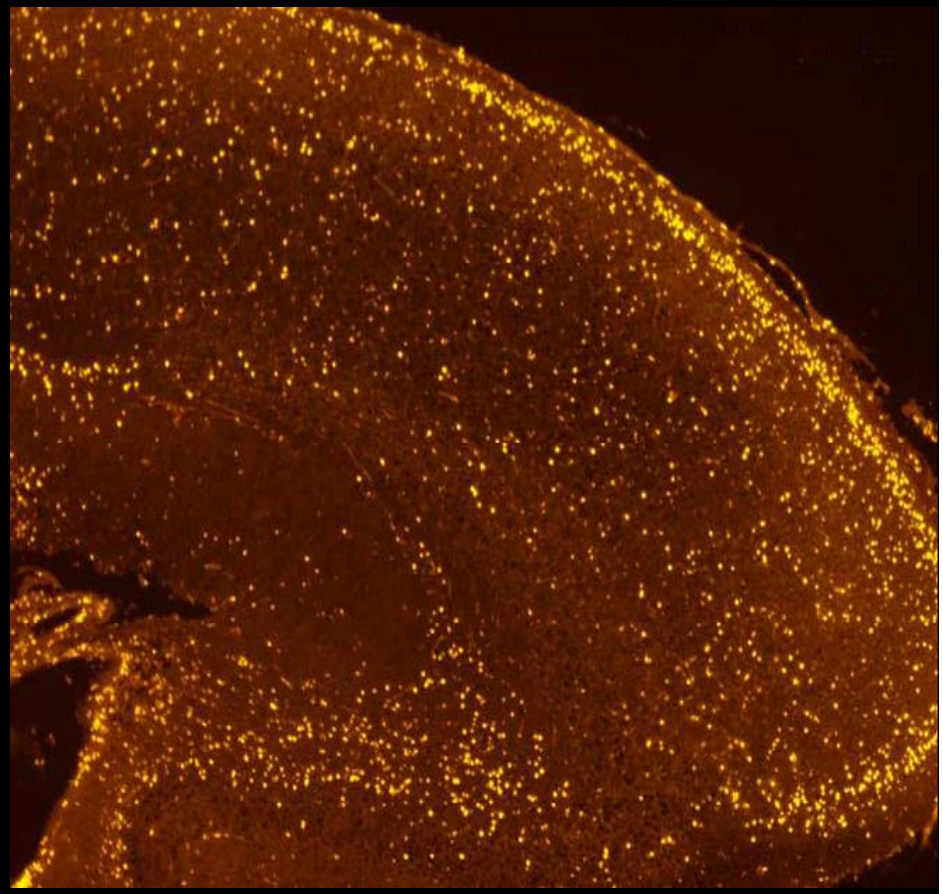


DHA deficiency (of marine fat) in the developing brain restricts migration of cortical neurones (Yavin E., Himovichi E. and Eilam R. (2009) Delayed cell migration in the developing rat brain following maternal Omega 3 alpha linolenic acid dietary deficiency. Neuroscience 162, 1011–1022.)

Maternal Diet 59 + marine fat

Diet 61 (Deficient)



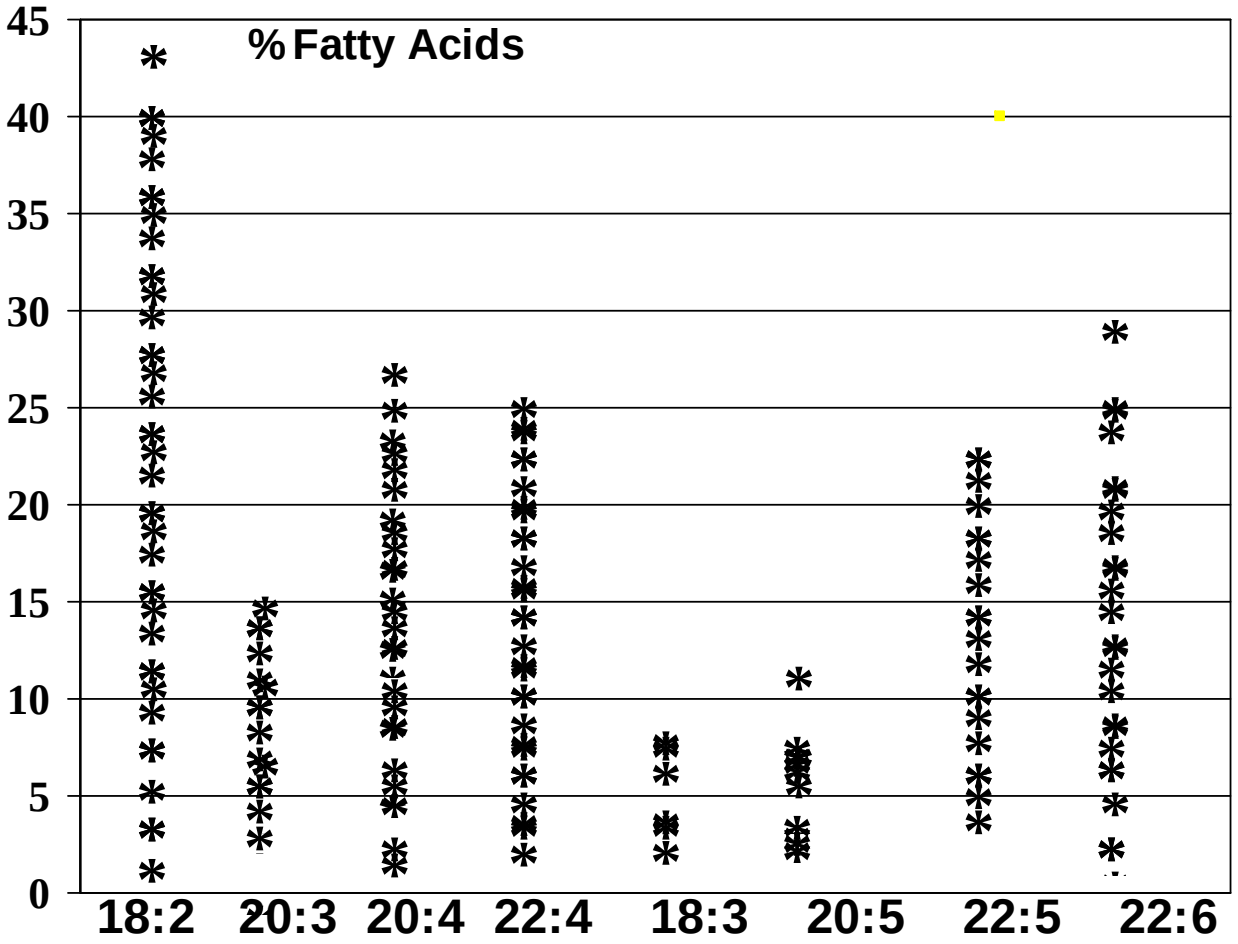


x4

PART III

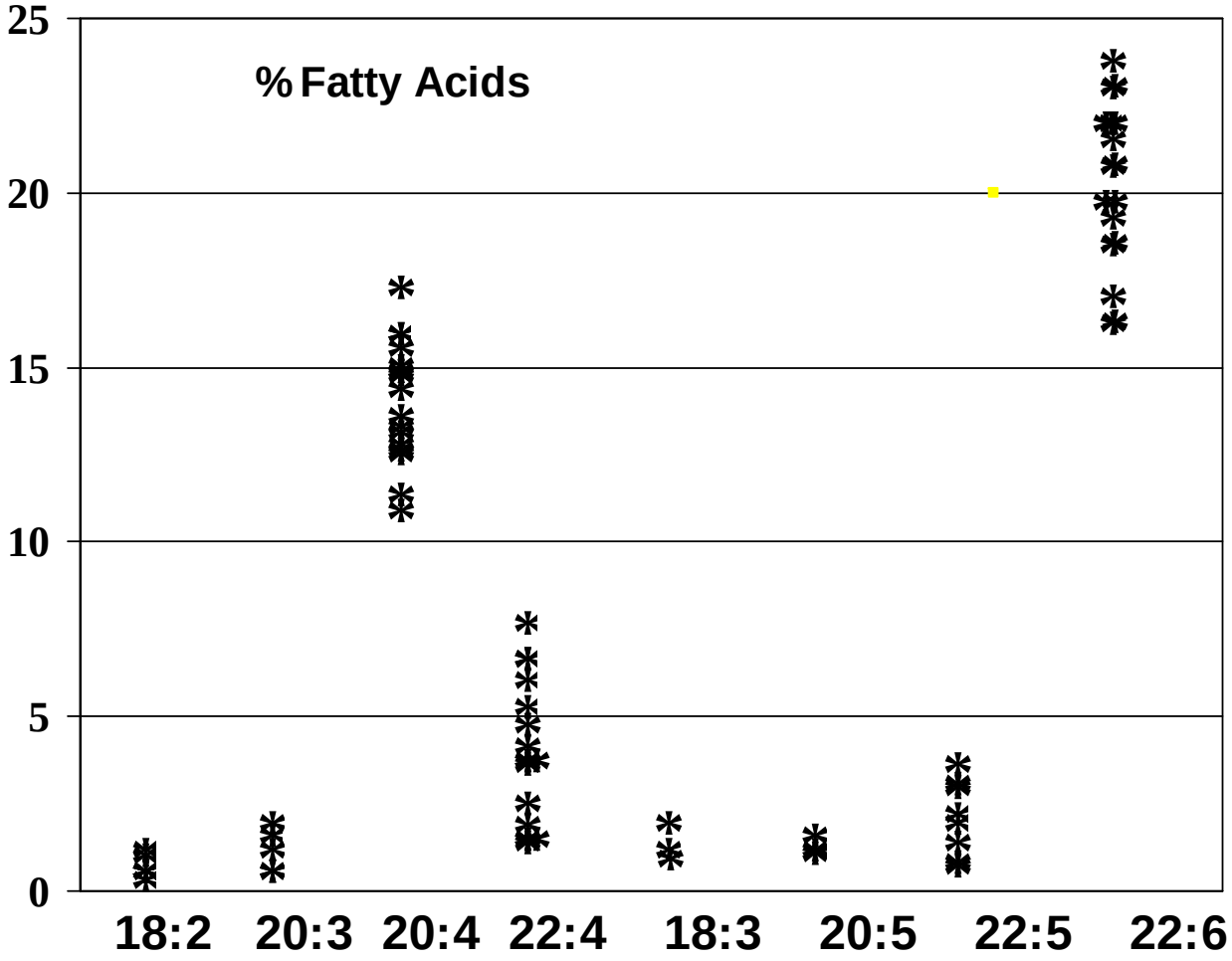
The essentiality of marine foods in the evolution of the human brain.

Liver Essential Fatty Acids
EPG – 42 SPECIES



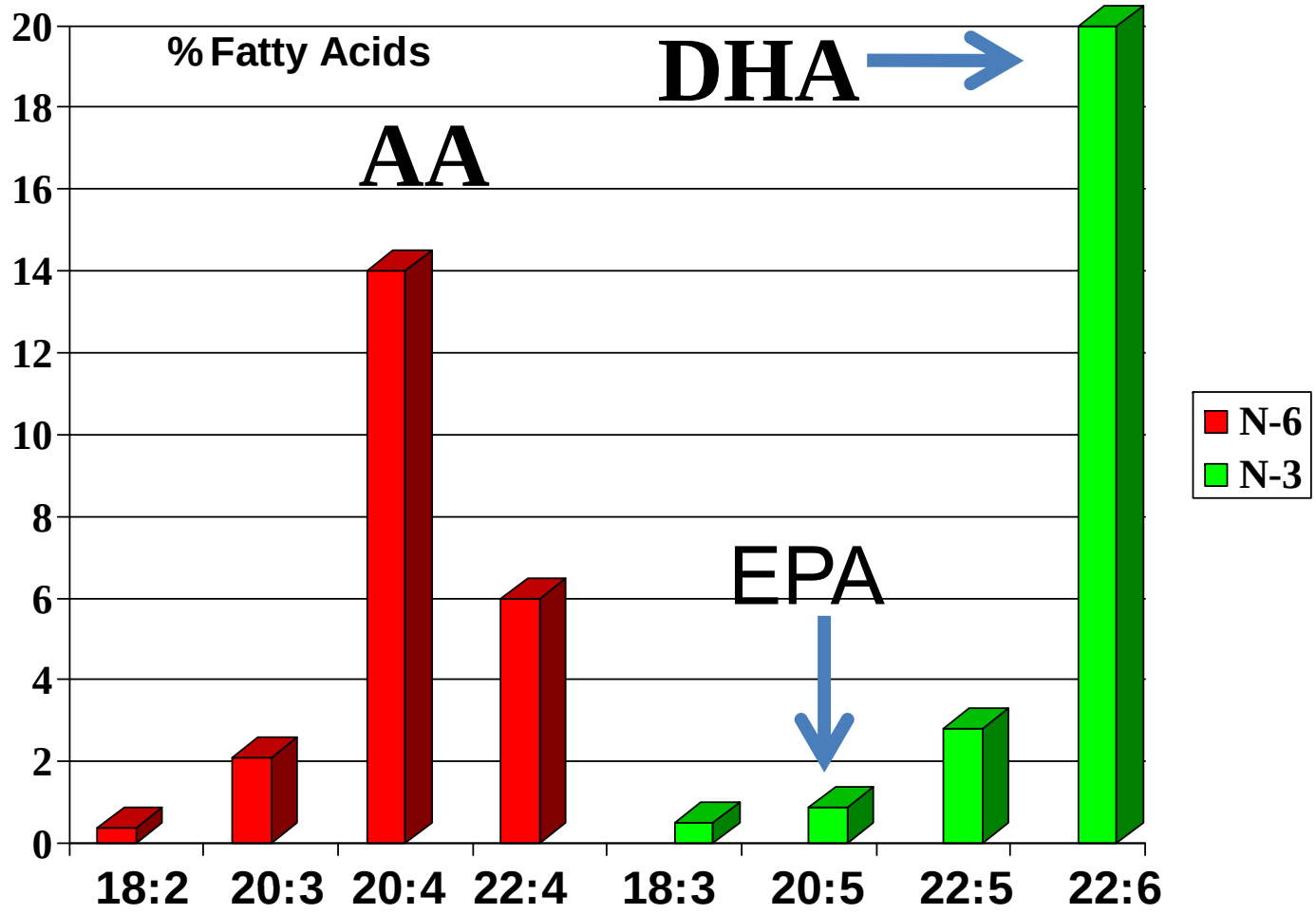
Crawford M, Casperd N. Sinclair AJ (1976) The long chain metabolites of linoleic and linolenic acids in liver and brain in herbivores and carnivores. Comp. Biochem. Physiol. 54B: 395-401.

Brain Essential Fatty Acid Composition
42 mammalian species (EPG)



Crawford M, Casperd N. Sinclair AJ (1976) The long chain metabolites of linoleic and linolenic acids in liver and brain in herbivores and carnivores. Comp. Biochem. Physiol. 54B: 395-401.

HUMAN BRAIN ESSENTIAL FATTY ACID COMPOSITION



Crawford & Sinclair (1972) "Nutritional influences in the evolution of the mammalian brain" Ciba Foundation Symposium (1971), Ed K Elliot & J Knight, 267-292

MARINE vs THE LAND:
FISH IS NOT OF VALUE FOR PROTEIN BUT DHA AND TRACE ELEMENTS

- DHA preformed is > 30 times more effective for brain growth than making it from plants.
- DHA is preferentially & selectively incorporated from the diet into cell membranes.
- Thus the carnivorous marine food web CONCENTRATES the DHA MANY FOLD.
- The land food web has been and is being progressively depleted of iodine, Se and other trace elements vital for the sustainability of brain development.



Last century, science and food policy focussed on protein and body growth.

H. Sapiens is about brain growth.

HUMAN MILK CONTAINS THE LEAST AMOUNT OF PROTEIN CFD OTHER LARGE MAMMALS



Note the similar sizes of the brain.

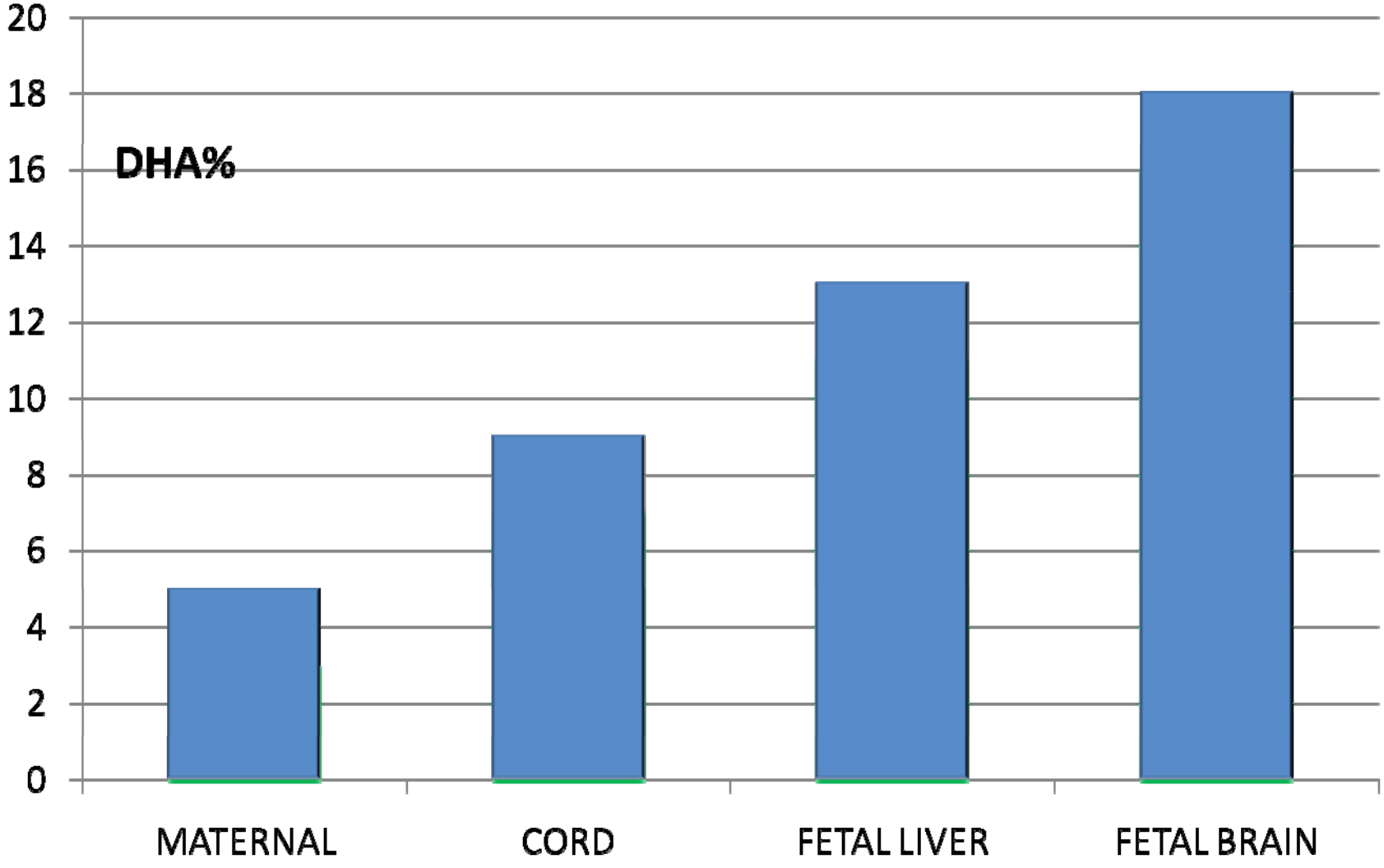
Note the sizes of the hands.

The brain is the first priority in H. sapiens

Body = protein
Brain = lipids.
<u>Priority is the brain specific lipid.</u>

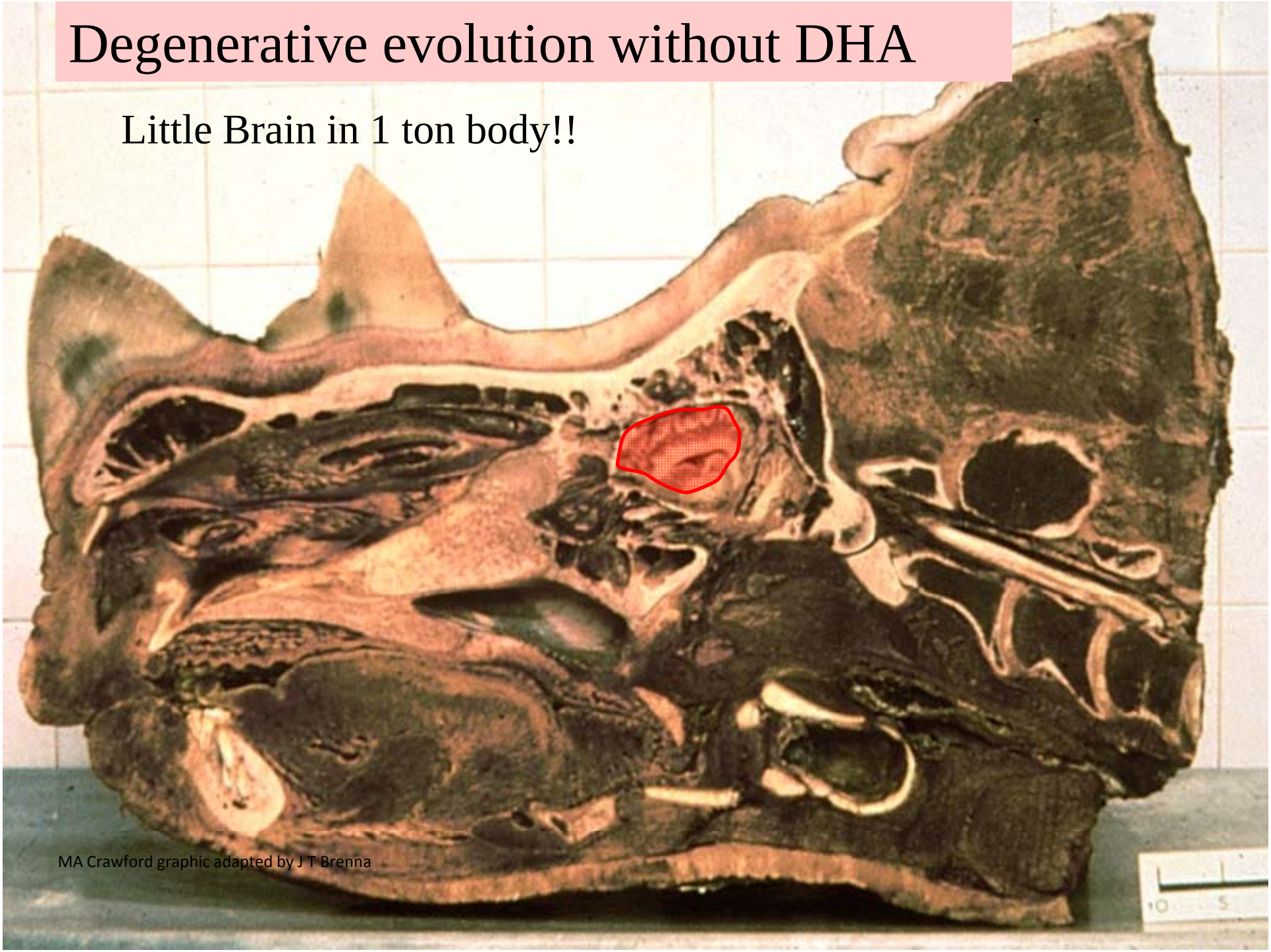
Crawford, M.A., Hassam, A.G., Williams, G. and Whitehouse, W.L. (1976) Essential fatty acids and fetal brain growth. LANCET (i): 452 453.

Biomagnification of DHA

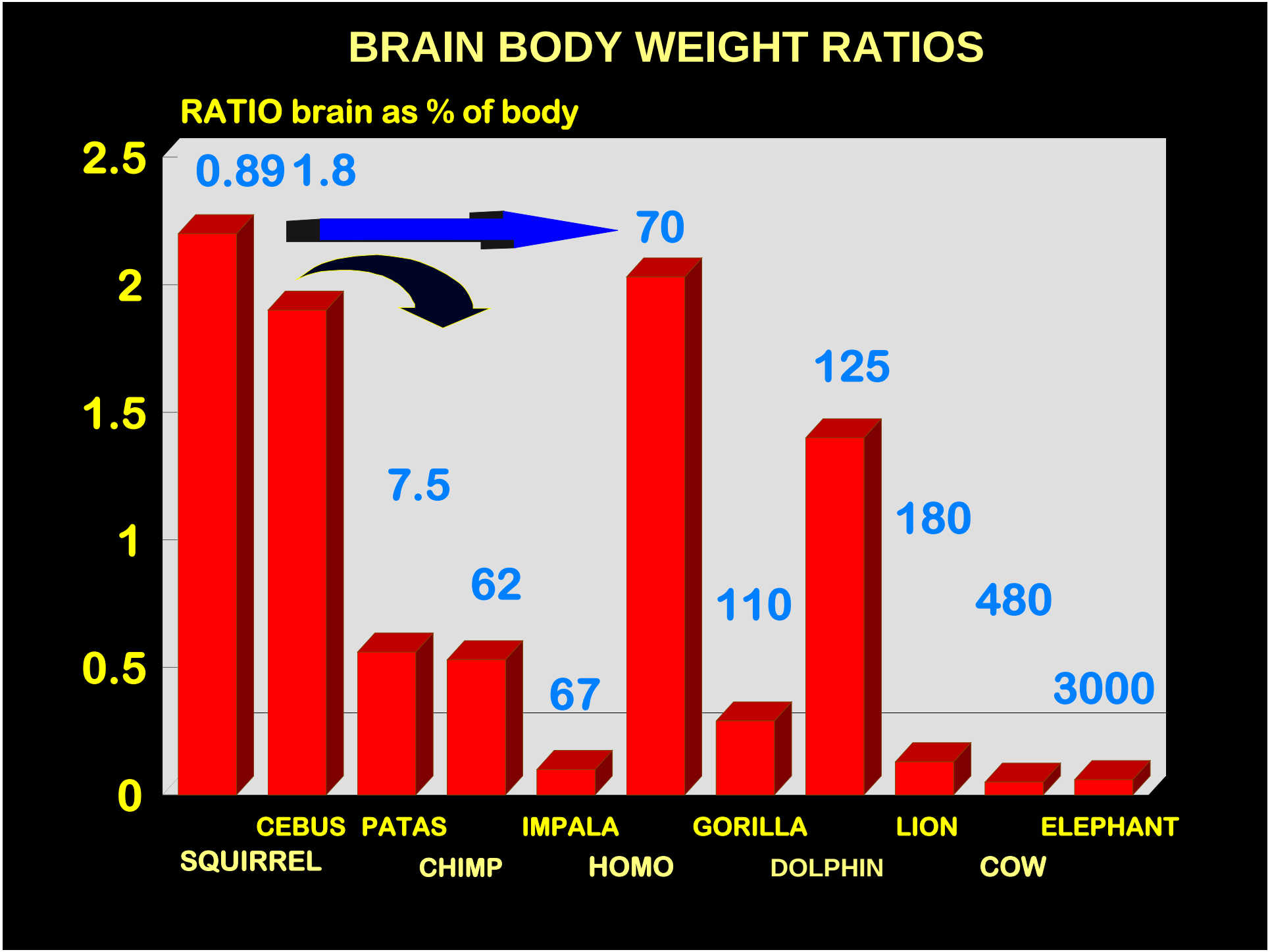


Degenerative evolution without DHA

Little Brain in 1 ton body!!



MA Crawford graphic adapted by J T Brenna

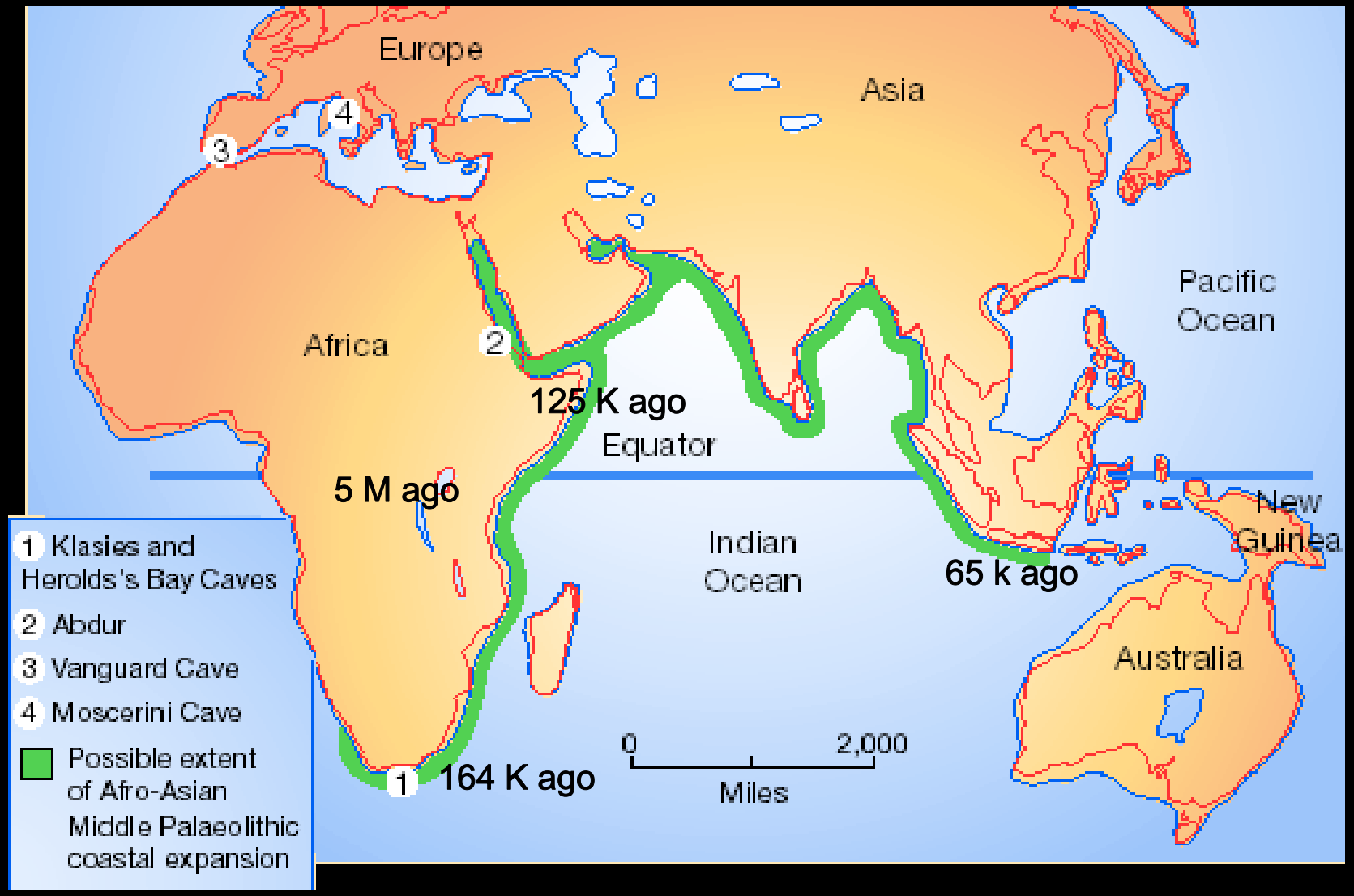

BRAIN BODY WEIGHT RATIOS
RATIO brain as % of body
2.5
2
1.5
1
0.5
0
0.89
1.8
7.5
62
67
70
110
125
180
480
3000
SQUIRREL
CEBUS
PATAS
CHIMP
IMPALA
HOMO
GORILLA
DOLPHIN
LION
COW
ELEPHANT

Early human use of marine resources and pigment in South Africa during the Middle Pleistocene

We have identified the earliest appearance of a dietary, technological and cultural package that included coastal occupation, bladelet technology, pigment use and dietary expansion to marine shellfish, and is dated to a time close to the biological emergence of modern humans (160-180kya).

Mareans CW et al 2007, Nature,449, 18 Oct. 905-908

Route of humans out of Africa about 65,000 y ago



Coasting out of Africa Stringer, C. Nature 2000; 405: 24-26

Moken Children have incredible underwater visual acuity. Born in the water, they swim and dive for food. They learn to walk on land at about 3-4 years of age . (Photo by Anna Gislén)





Philip Tobias

"We were profoundly and unutterably

R I o x S z

PART IV

THE GLOBAL NUTRITION CRISIS AND THE RISE IN MENTAL ILL HEALTH

THE GLOBAL CIRIS IN NUTRITION

- 1804 1 BILLION
- T0 1912 2 BILLION
- 1960 3 BILLION
- 2000 6 BILLION
- 2011 7 BILLION
- 2023 8 BILLION
- 2050 9 BILLION.

Foresight 2011 not enough arable land.

Selected Recommendations EPA + DHA

Norway	1100
Canada	1100
NATO	800
Belgium	650
France	500
ISSFAL	500
Australia	500
UK	450
FAO	250
EFSA	250
Netherlands	200
US	200

FAO 2010 250mg/day for pregnancy

Average
566

Variation
5.5x

The Oceans: Capture Fishing already does not provide enough omega 3!

- 7 Billion times 250 mg DHA = 1.75 Bn.g/day.
- 1.75 Bn.g/day = 1.75 M. Kg/day
- But 200 g fish need to be eaten to get 1g DHA.
- 1.75 M Kg times 200 = 350 M Kg fish/day
- 350 times 365 days = 127 M metric tons/year..
- Estimates of fish = about 104 M metric tons.
- One third of the fish is fed to animals.
- Linoleic acid from cereals and vegetable oils competes with EPA and DHA.
- Soya production increased in the diet >1,000 fold since 1945.
- REDUCE CEREALS & SOYA LA TO MAKE DHA MORE AVAILABLE.

THE REMARKABLE NEGLECT OF BRAIN AND HENCE MATERNAL NUTRION & HEALTH,

- WHO: ***The World Health Assembly 2012*** with Heads of Sates, signed up to the elimination of non – communicable diseases (NCDs).
- These are: **diabetes heart disease, cancer, stroke and lung disorders** (e.g asthma).
- No mention of brain disorders.
- Yet brain disorders now cost more than 2 NCDs combined (heart disease and cancer).*
- Yet WHO has repeatedly pressed its slogan “No
- health without mental health”.

* Dr. Jo Nurse DoH UK 2007 & 2010

1972 SUNDAY TIMES REVIEW OF THE PREDICTION# BY GRAHAM ROSE*

UNLESS SOMETHING IS DONE TO PRIOTISE BRAIN NUTRITION. THEN WE WELL BECOME

“A RACE OF MORONS”

!

Nothing has been done and the prediction that brain disorders would follow in the wake of the rise in mortality from heart disease

The prediction has now been tested and confirmed.

*Graham Rose S Times 5-11-1972 p 11 The Acid Key to your Brain Power.

#“**What We Eat Today**” by Michael and Shelagh Crawford (1972), Neville Spearman, SBN 85435 360 7. Chap 15, page 141-142.

FAO RECOGNISED THE IMPORTANCE OF DHA TO THE BRAIN AND HEART IN 1978

- **1978** a Joint International consultation between FAO and WHO: “The role of dietary fats and oils in human nutrition” FAO Nutrition report no 3, FAO, Rome.
- **1994** Second report on Fats and Oils puts numbers on the principles identified in 1978, Specifies amounts for infants.
- **2010** A third report. Recommends 250g EPA+DHA in pregnancy.

Foresight 2011 Think Tank.

- Report on the future food and agriclture.
- 300 international technical experts and 2 years in the writing.
- No mention of the specific requirements of the brain.
- Claims there is not enough arable land to meet population growth.
- Conclusion more intensification and GM.
- Why is there no serious mention of the oceans?

Why did the FDA followed by FSA and EFSA pick MeHg in fish?

- Japanese mothers eat fish and or sea food every day: their babies grew up to have the least major depression, least mental ill health, least heart disease best longevity. Where is the evidence of neurotoxicity from eating fish?
- Yet intensively reared beef is stuffed with atherogenic, thrombogenic, obesigenic fat!!
- **AND THEY ARE EXPORTING CARDIOTOXIC, AND ATHEROTOXIC PRODUCTS FROM INTENSIVE ANIMAL PRODUCTION.**


KEEPING IT FRESH
Fresh Zone
BEEF
SCOTCH FILLET STEAK
BEST BEFORE END OF
06/02/08
BATCH CODE
093599602
NET WEIGHT kg
0.668
PRICE $/kg
23.99
TOTAL PRICE
$ 16.03
0 202142 014697
SPECIAL PRICE
$/kg 21.99
$ 14.69
COOK THOROUGHLY TO 75°C. REFRIGERATE AT 4°C OR BELOW.
FREEZE IN ORIGINAL PACKAGE FOR UP TO 3 MONTHS
PACKED FOR PROGRESSIVE ENTERPRISES LTD 80 FAVONA RD MANGERE AUCKLAND
quality guarantee
Fresh Zone. Fresh products you can trust, quality you can rely on. If you are not fully satisfied, return this product. We will replace it AND refund your money.
beef & lamb
The very
Best of
New Zealand
GRILL/FRY/BBQ
COOKING GUIDE
Garnish with herbs/spices, garlic and onion to taste. Cook on preheated grill or frypan 3-7 minutes each side depending on thickness and preference.
QUALITY MARK MEAT
visit www.recipes.co.nz for meal ideas
✓ tenderness tested
✓ no added hormones
✓ free range
901561 T1068

BEIJING SUPERMARKET



Global Forum For Health

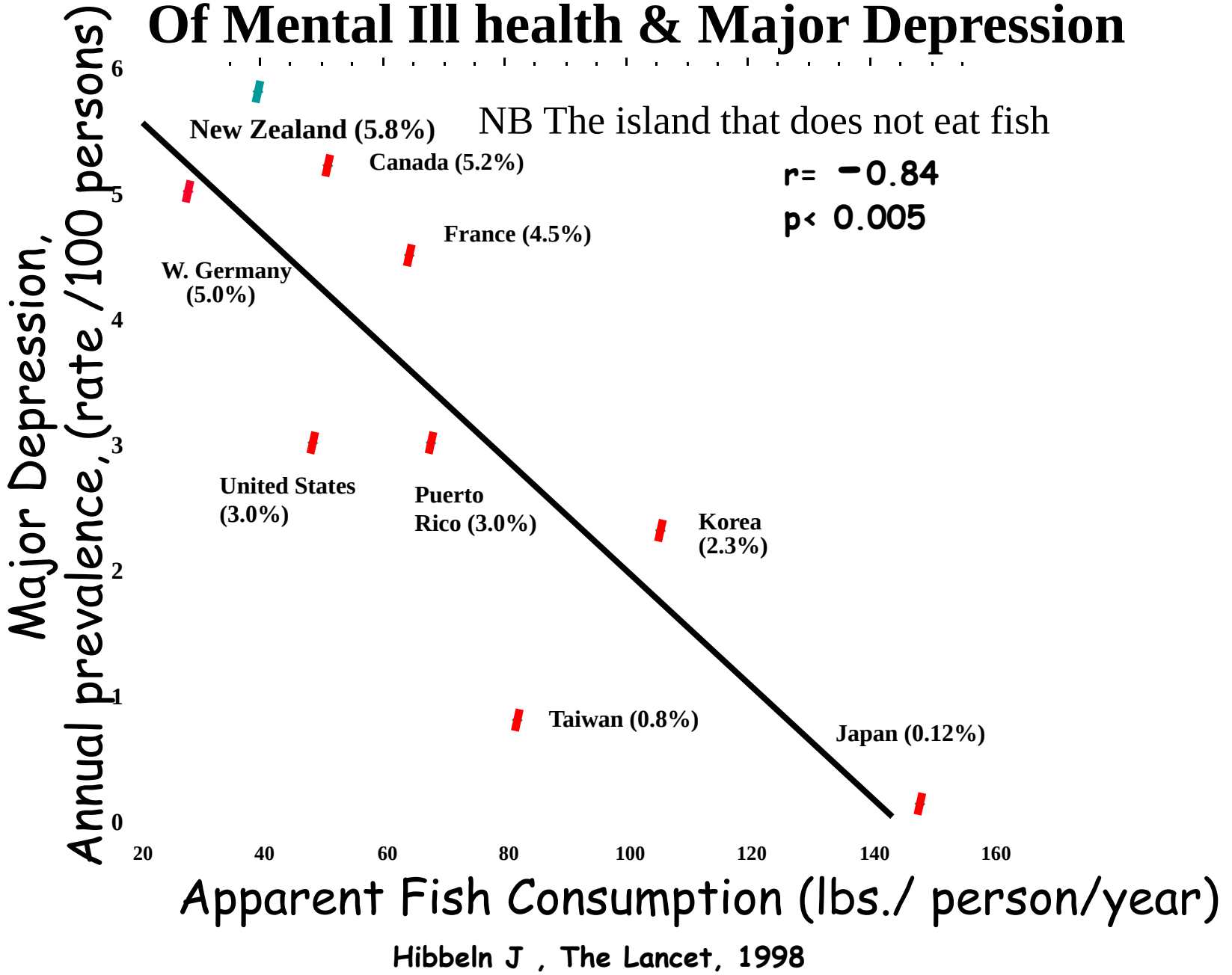
First Seven In Order Predicted for 2020.

BURDEN OF DISEASE ---------	1990	2020	
• Coronary Heart Disease	3.4	5.9	#
• Perinatal Conditions	6.7	5.7	#
• Mental ill health	3.7	5.7*	#
• Cerebrovascular disease	2.8	4.4	
• Tuberculosis	2.8	3.1	
• Lower respiratory infections	8.2	3.1	
• Diarrhorheal disease	7.2	2.7	

*** Includes schizophrenia**

All 3 are related to adverse nutrition.

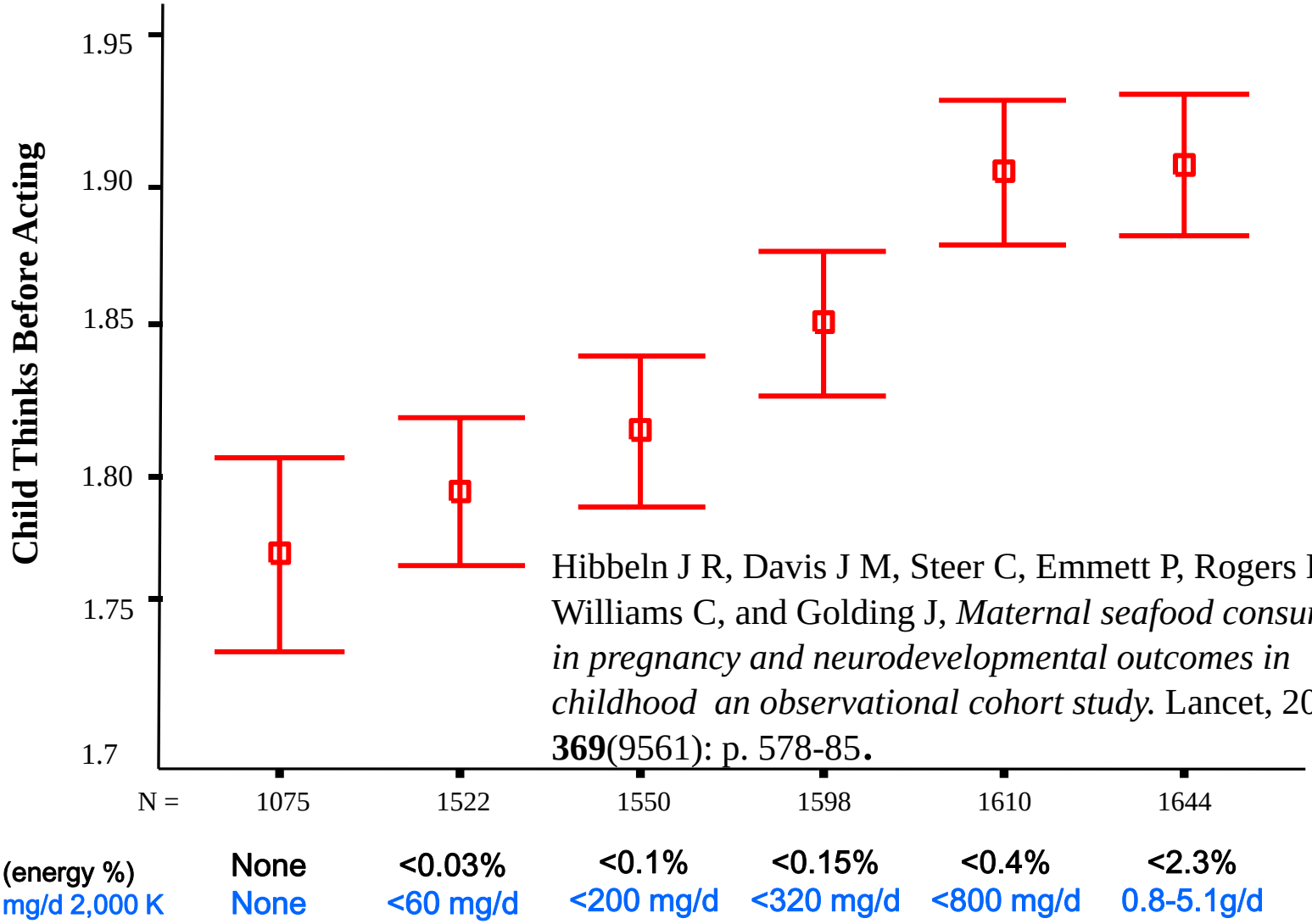
Fish Consumption and the Annual Prevalence Of Mental Ill health & Major Depression



Hibbeln J , The Lancet, 1998

ALSPAC: Child thinks before acting (8 y) and

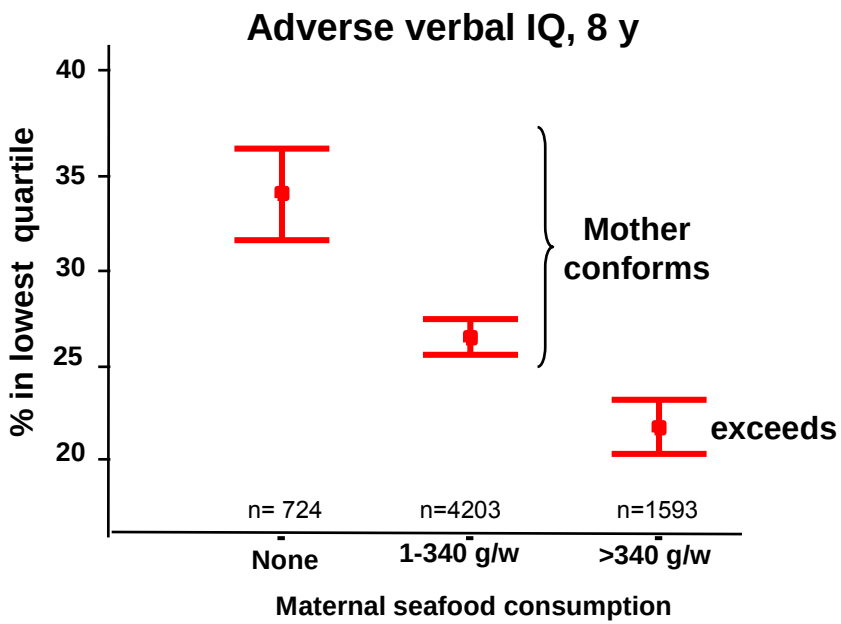
Omega-3 intake by mother in pregnancy (32 w)

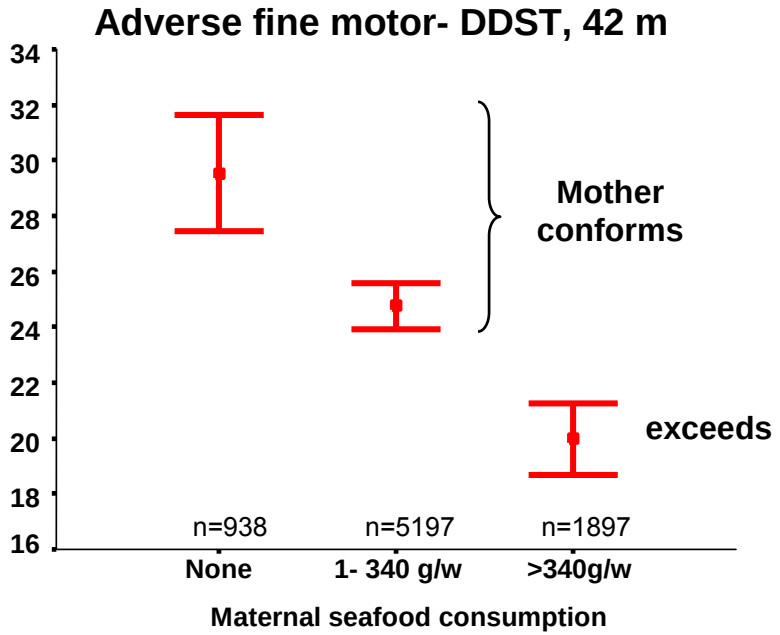


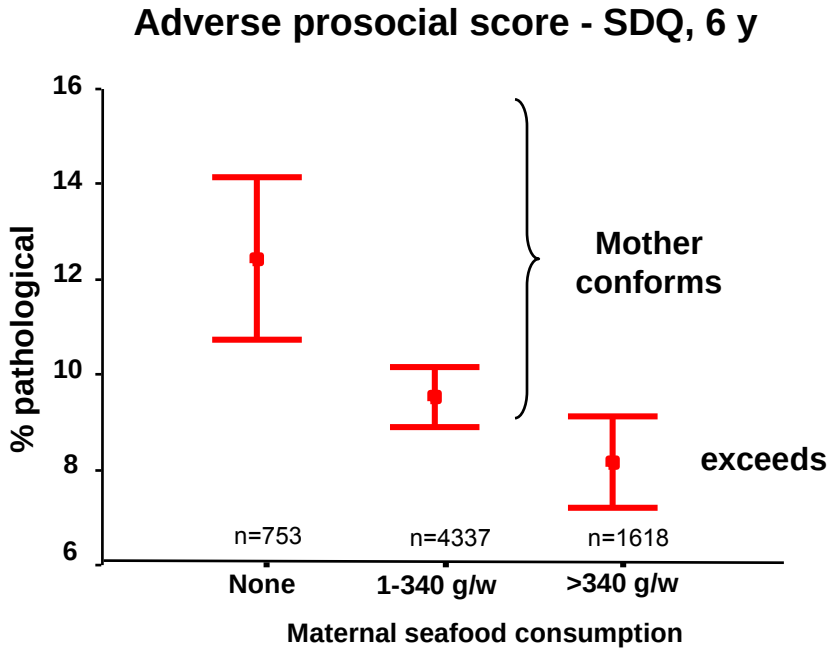
Hibbeln J R, Davis J M, Steer C, Emmett P, Rogers I, Williams C, and Golding J, *Maternal seafood consumption in pregnancy and neurodevelopmental outcomes in childhood an observational cohort study.* Lancet, 2007. **369**(9561): p. 578-85.

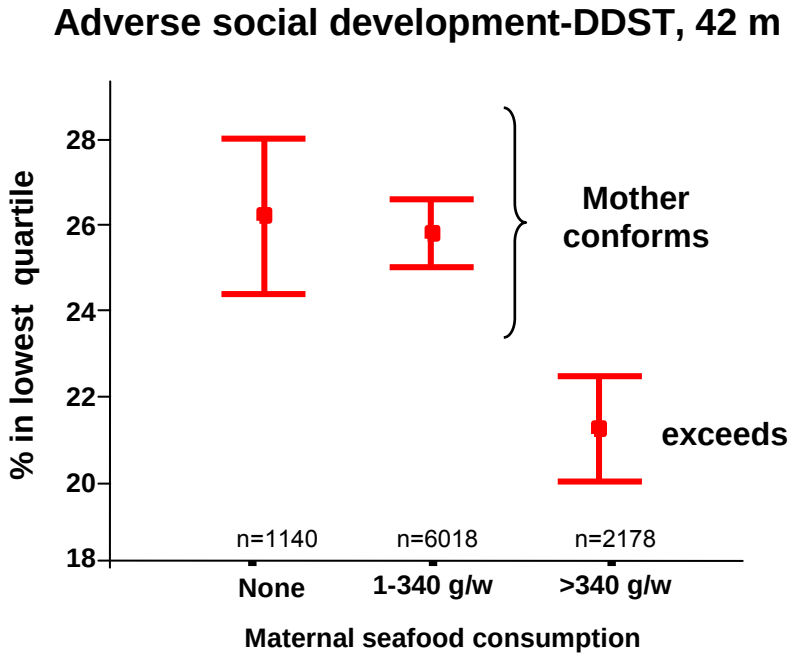
Maternal omega-3 intake from seafood at 32 wks gestation

HIBBELN J et al ALSPAC Lancet 2007





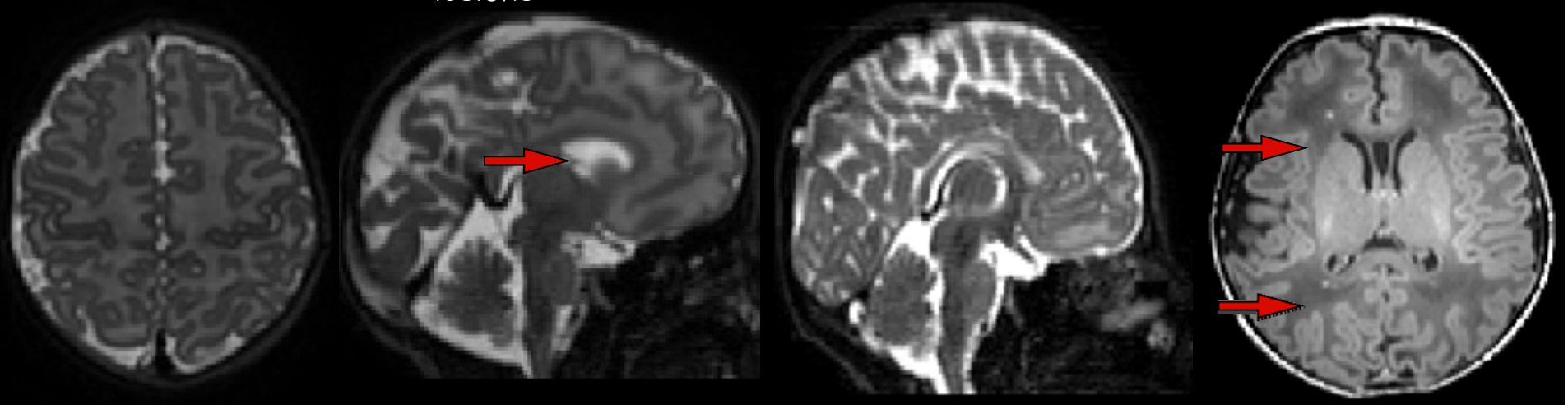




urrent work on . \ . scans at birth of allegedly normal infants. yst shown below. lso we see deep venous anomalies in /.. (<% reported in adults).

Normal

Cyst (arrow) – white matter altered signal intensity – punctate lesions



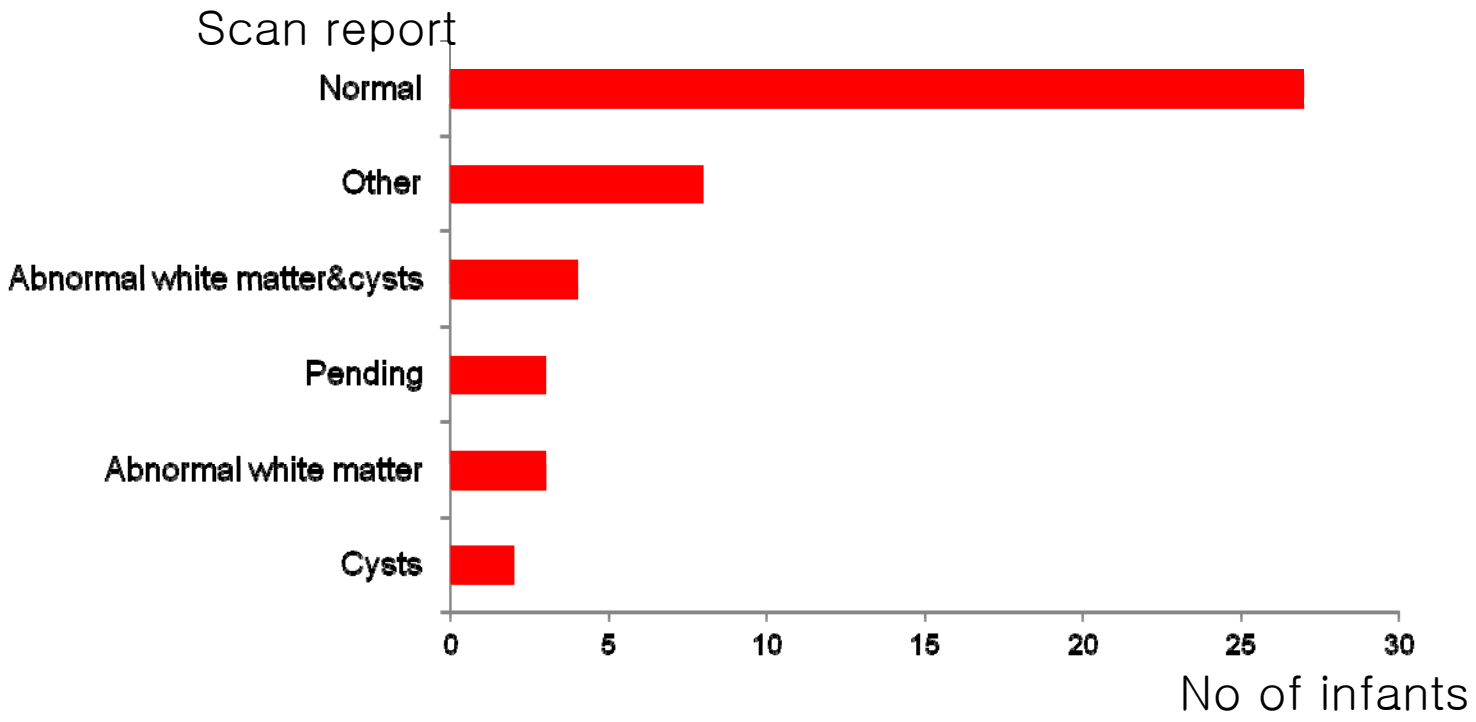
22% in preterm infants

Conclusion: poor maternal/fetal nutrition leads to a permanent diturbance of regional brain development with consequences for mental ill health, cognitive, learning and behavioural deficits with risk oif dementias later.

Imperial College London

MRC Clinical Sciences Centre

Brain MRI scan at term age – Scan results
First 56 infants.

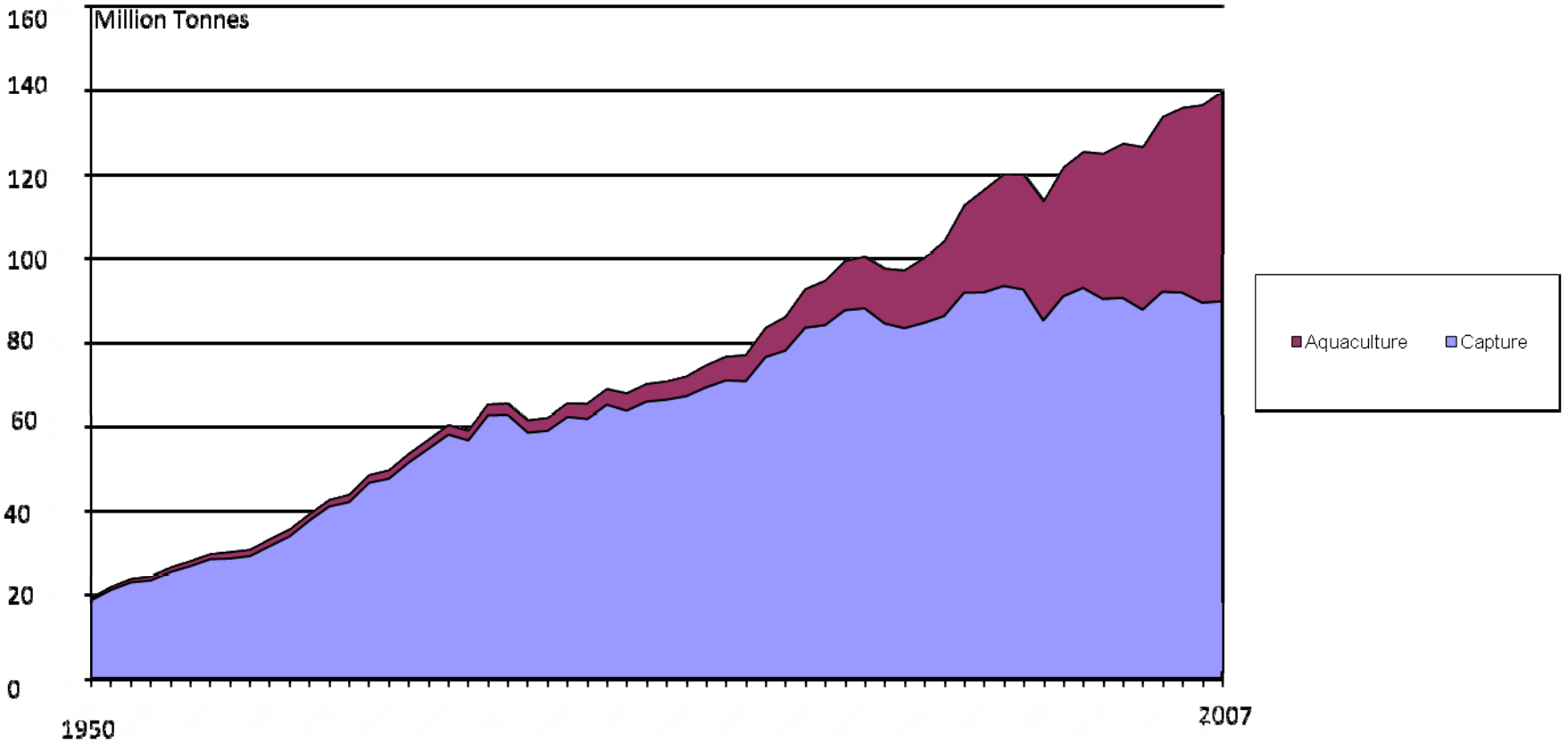


Part V Final.

Fisheries and the future.

World capture & aquaculture production.

Aquaculture of carnivorous fish depends on the wild catch and thus is limited.



Grimur Valdimarsson FAO

AQUACULTURE
is only a partial solution.

- For carnivorous fish it depends on by-products of the wild catch which has reached its limit.
- Industry is investing in producing food for such fish from the land. BUT:
- Already use of vegetable oils is negating the health benefits. Linoleic acid used to be 0.5% and is now >8%. This runs a risk of a fish BSE.
- Fish is additionally important for the trace elements but these have been depleted on land by 600 million years of rain. The loss in vegetables and fruits since 1950 has been documented.

Hunting & Gathering of Fish has Reached its Limit.

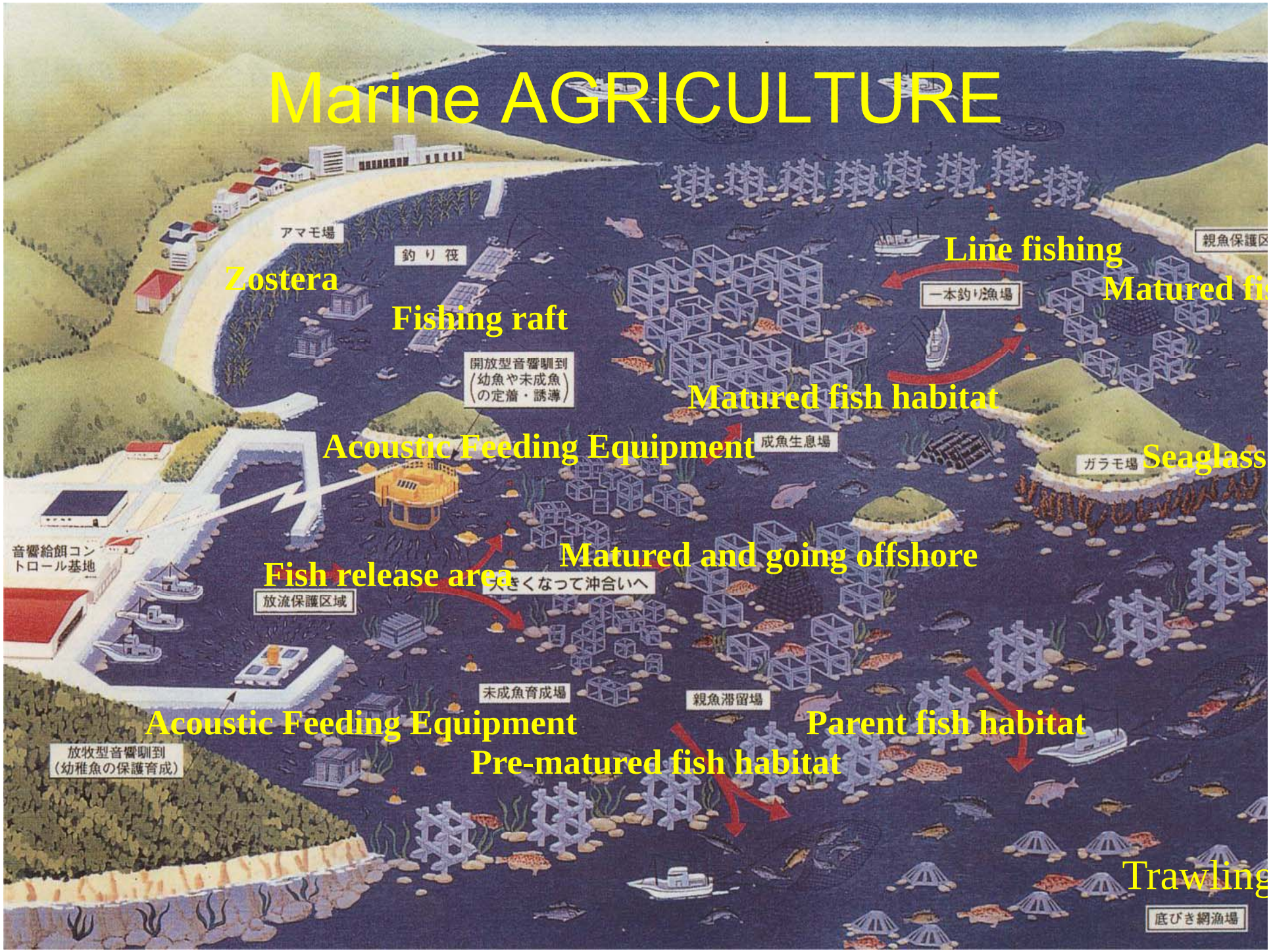
Marine Agriculture : Shiraishijima Island's Marine Ranching Project in Okayama

Takehiro Tanaka

Director of Fisheries Division,

Department of Agriculture, Forest and Fisheries

Okayama Prefectural Government


Marine AGRICULTURE
アマモ場
釣り筏
Zostera
Fishing raft
開放型音響馴到
(幼魚や未成魚
の定着・誘導)
Line fishing
一本釣り漁場
親魚保護区
Matured fi
Matured fish habitat
Acoustic Feeding Equipment
成魚生息場
ガラモ場
Seaglass
音響給餌コン
トロール基地
Fish release area
放流保護区域
Matured and going offshore
大きくなって沖合いへ
未成魚育成場
親魚滞留場
Acoustic Feeding Equipment
Parent fish habitat
放牧型音響馴到
(幼稚魚の保護育成)
Pre-matured fish habitat
Trawling
底びき網漁場

Artificial Reefs

生息環境の整備に用いた魚礁



Habitat for Juveniles

幼稚魚のための魚礁



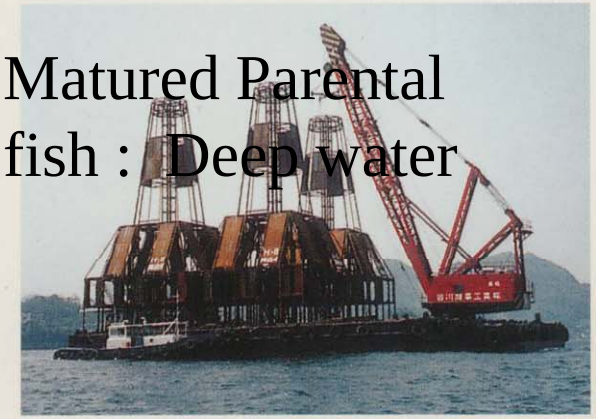
Habitat for marine plants in local feeding grounds

未成魚のための魚礁



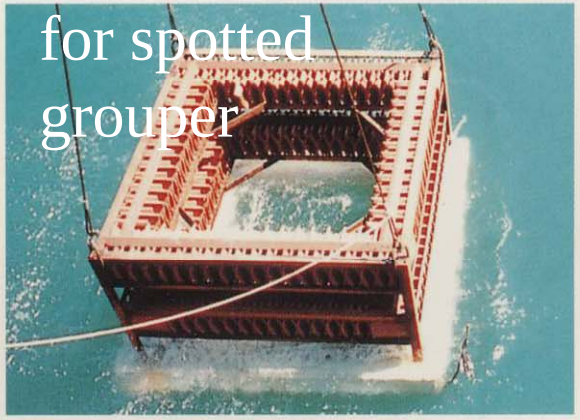
matured fish near natural reefs

成魚のための魚礁



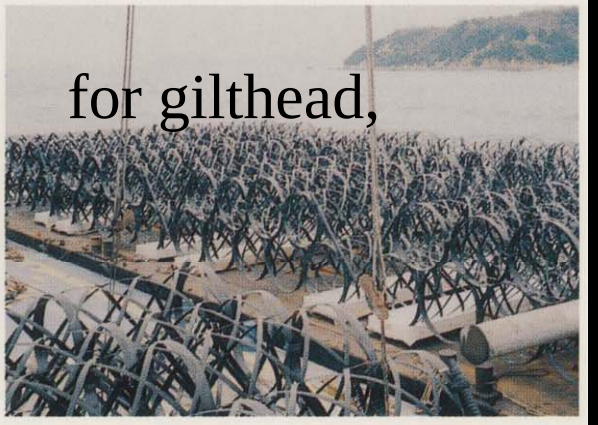
Matured Parental fish : Deep water

親魚のための魚礁



for spotted grouper

キジハタのための魚礁



for gilthead,

クロダイのための魚礁

LAND - GREEN PASTURE



Marine Pasture Development (Dr. T. Tanaka)



Eel Grass (Zostera marina)

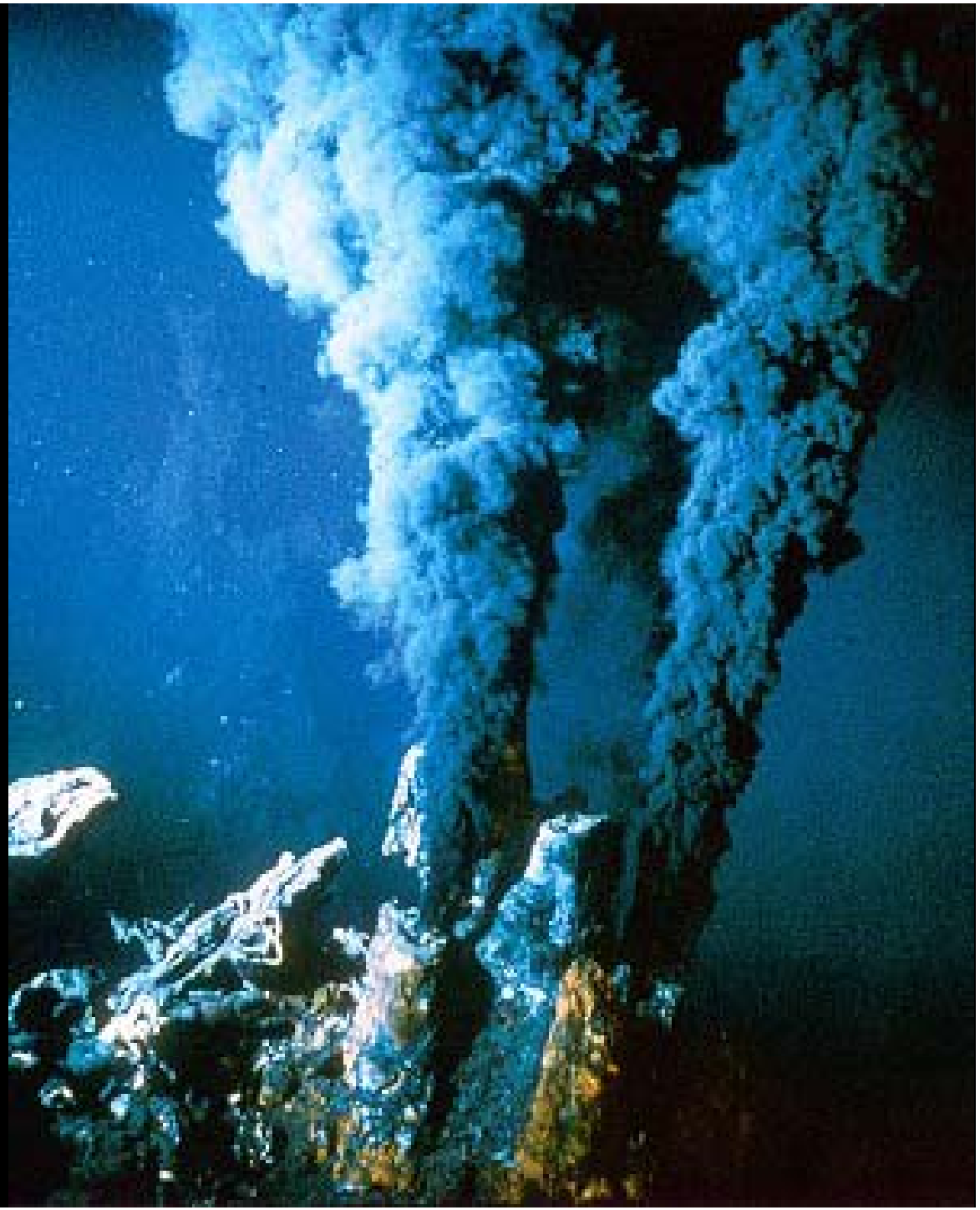
In Okayama surrounding region, specifically for the 7 target species the catch has decreased from 800t to 550t in that time.

However, in the marine ranch, the catch for the 7 species has almost doubled.

Geothermal vents inject iron, manganese especially but also a wide range of trace elements contributing to the local food web and ultimately to the web at the upper levels.

Giant tubeworms can grow to 2.4 m (7 ft 10 in)[1] tall because of the richness of nutrients.
By now, over 300 new species have been discovered at hydrothermal vents.
Little is known about the deep sea food web which will be significant as it supports the growth of the giant squid.

Without light, whale falls etc provide an important source of nourishment.



Sea Bed Kelp Farming –Bali, Indonesia



Mussel Farm, Coramandel New Zealand

Snapper and crab feast: Rich source of iodine



The <u>2009 & 2012 Declarations of Manila</u>

Priority of 11 East Asian Fishery Ministers was the arrest of river, estuary & coastal pollution.



WHAT DOES THIS ALL MEAN?

Rise in Brain disorders

EU - 2004 €386 Billion 2010 € 789 Billion

UK 2007 £77 Billion : Greater than heart disease and cancer combined.

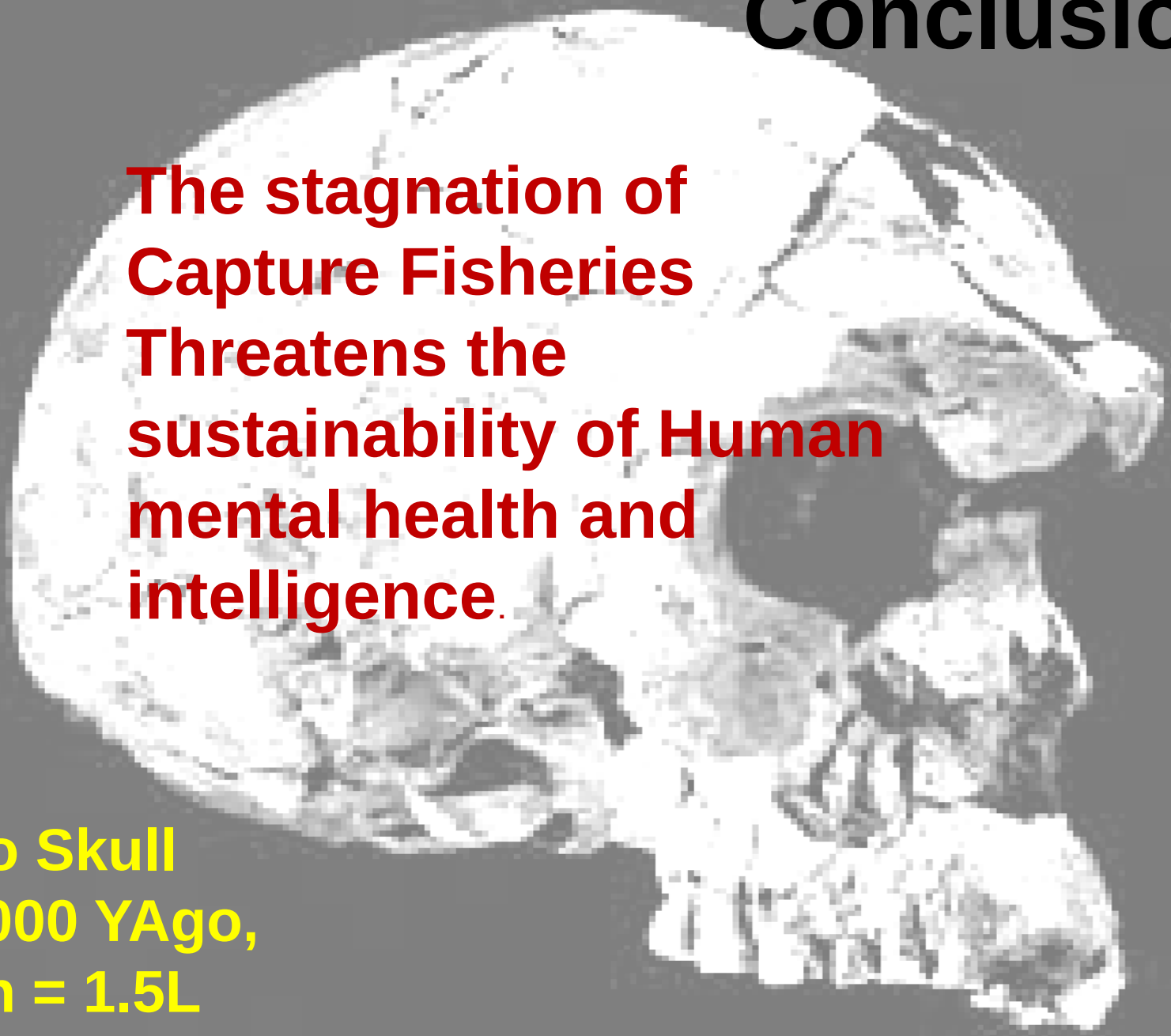
2010 £105 Billion

USA >$400 Billion

WORLD: No 2 Burden of health world wide IN 8 YEAR'S TIME.

Conclusion

The stagnation of Capture Fisheries Threatens the sustainability of Human mental health and intelligence.



Herto Skull
160,000 YAgo,
Brain = 1.5L

VISION AND THEN THE BRAIN EVOLVED IN THE OCEANS 600-500 MYA. IT STILL DEPENDS ON THE SAME SEA FOOD. THE FUTURE OF HUMANITY DEPENDS ON THE SUSTAINABILITY OF MARINE FOODS:
THAT MEANS MANAGEMENT AND MARINE AGRICULTURE.



THANK YOU



Collaborators

- **Myer Bloom – Physics, Vancouver, Canada**
- **Annette Brand, Q-Tof, Weizmann Institute, Israel***
- **Leigh Broadhurst – Geophysics & Paleoanthropology, USDA*.**
- **Stephen Cunnane –Neurodegeneration, Sherbrooke, Canada.**
- **Keb Gebremeskel – Lipidomics, London Metropolitan, UK.**
- **Martin Guest, Liverpool Hope University, UK ***
- **Laurance Harbige - Immunology Greenwich, UK**
- **Holm Holmsen – Membrane signalling Bergen, Norway**
- **David Marsh, evolution researcher, London.**
- **Atulya Nagar, Liverpool Hope University, UK ***
- **Enitan Ogundipe, Imperial College, London, UK***
- **Walt Schmidt, MD, NMR, USDA, Beltsville.***
- **Nora Tusor, Imperial College, MRC Neuroscience, UK***
- **Hiramitsu Suzuki – Synaptic uptake of DHA, NFRI, Japan**
- **Yiqun Wang – Lipidomics, London Metropolitan University UK.***
- **Ephraim Yavin – neuronal migration, Weizmann Institute, Israel***

* Specifically involved in the work involved in this presentation



International Coalition of Fisheries Associations

Making a Difference to Poverty and Hunger

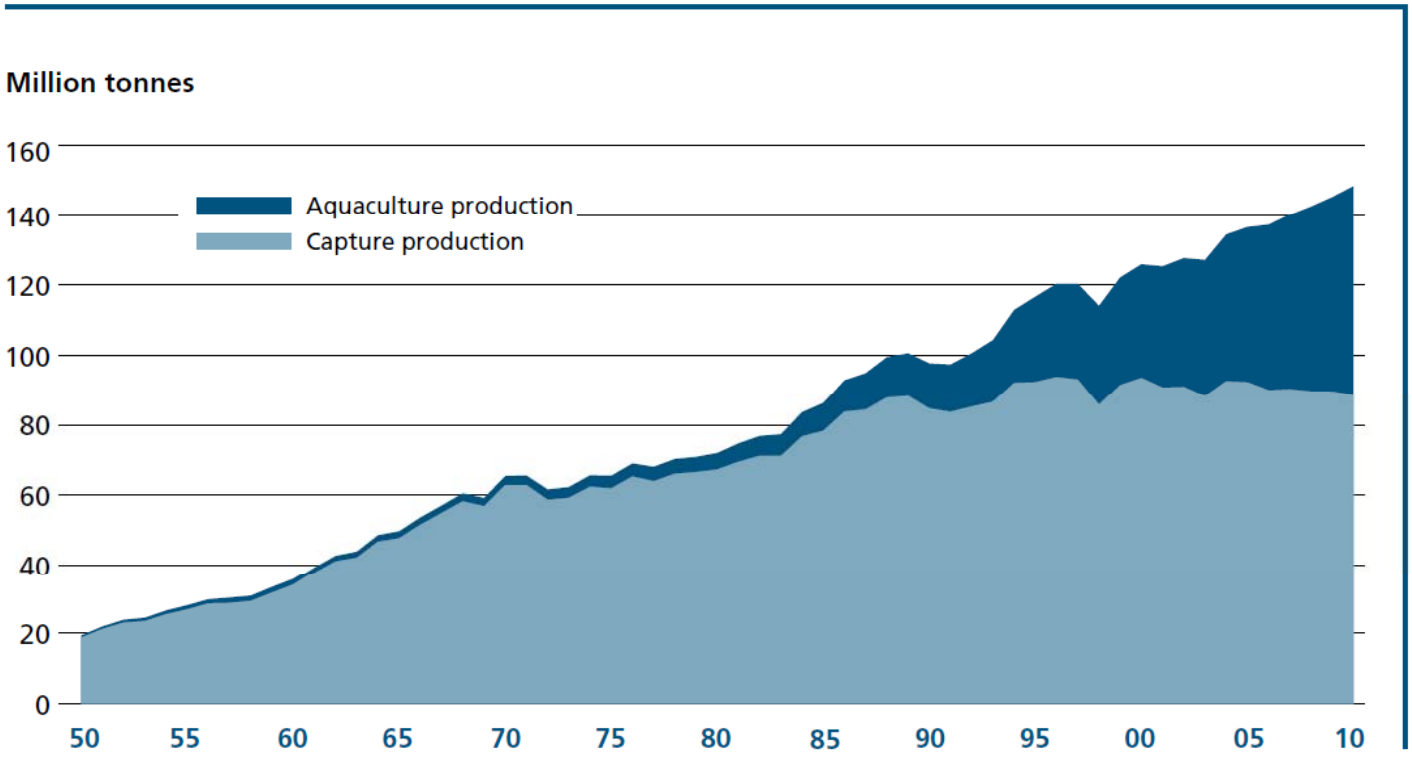
Alastair Macfarlane

Executive Secretary

Stable Capture Fisheries Supplies

Figure 1

World capture fisheries and aquaculture production

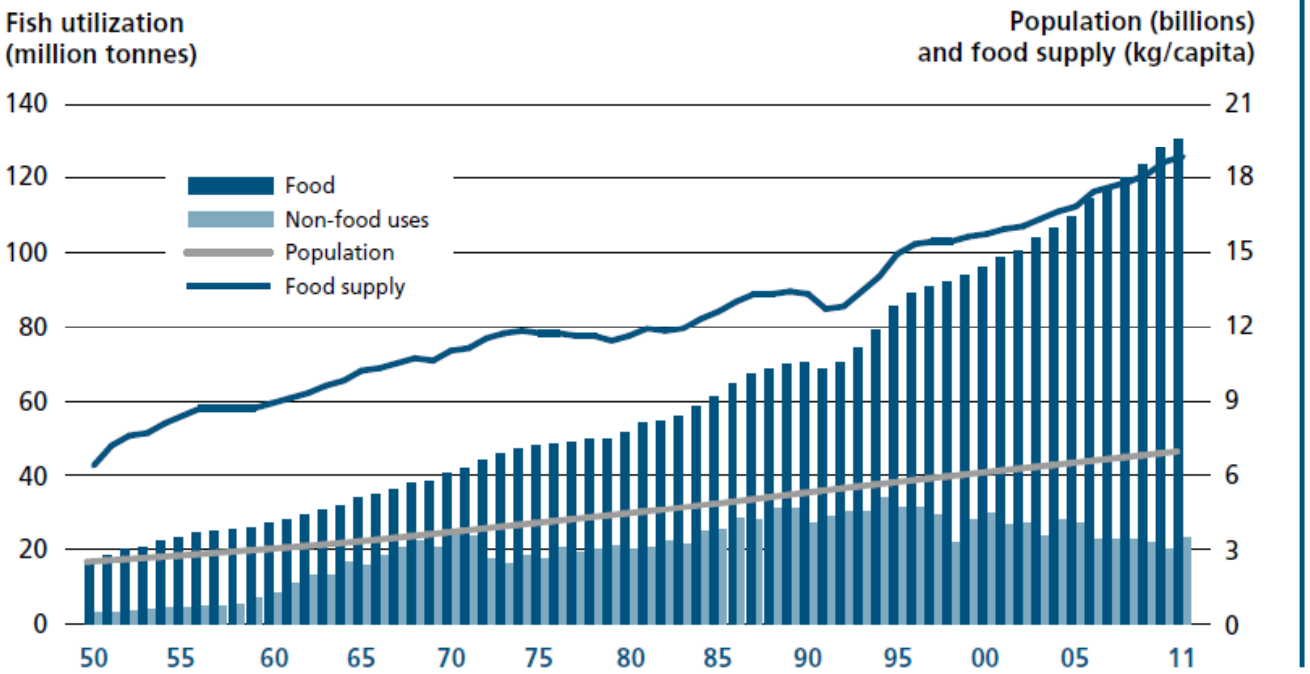


International Coalition of Fisheries Associations

Fish supply is growing faster than population

Figure 2

World fish utilization and supply



International Coalition of Fisheries Associations

Stable supplies from capture fisheries

- 80 million tonnes of fish supplied from capture fisheries;
- 56 million tonnes (70%) from sustainably managed fisheries – with a long-term stable production outlook;
- Management of the remaining 30% requires improvement in order to ensure overall stability.

Human needs for fish supplied by a relatively small number of people

- Capture fisheries employ 38 million people
- 84% are employed in fisheries in Asian countries
- The 38 million people employed in fishing produce all the captured fish that feeds the other 7 billion people in the world

People obtain fish by trading

- The overwhelming majority of people in the world get the fish they eat by buying it – in local markets, or from fish mongers, or supermarkets or in meals purchased away from home.
- Fish is the most highly traded food group. FAO reports that fish is the most internationally traded food. But fish is also supplied locally by trade from local fisheries too

Poverty alleviation and nutrition needs require viable markets

- Fishing makes its contribution to alleviating poverty and hunger by providing employment to 38 million people, who in turn supply all the capture fish eaten by the other 7 billion people in the world.
- Fishing can only make this contribution through markets – local, regional and international.



International Coalition of Fisheries Associations

"How can fisheries and Aquaculture Sectors Feature more Prominently? - The Sri Lankan Perspective"

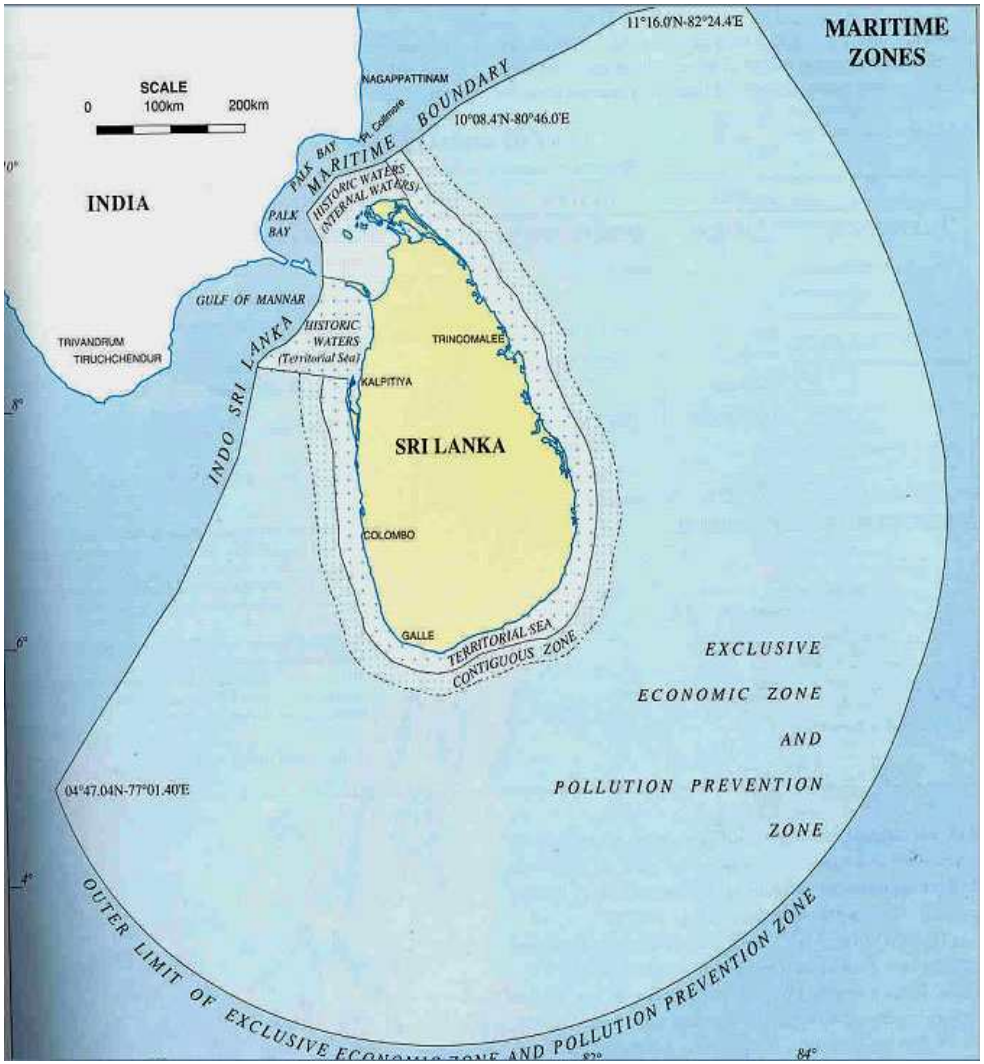
By

Dr Rajitha Senaratne

Hon. Minister of Fisheries and Aquatic Resources Development
Sri Lanka

FAO Symposium on " Alleviating Hunger and Poverty: Making a Difference with Fish"

8-9 August, Yeosu, Korea



SRILANKA - MARITIME ZONES AND INLAND ZONES

Maritime Zones

Exclusive Economic Zone (km^2)
517,000

Lagoons & Estuaries (hectares)
158,000

Mangrove Areas, Mud Flats &
71,000 (hectares**)**

Inland & Aquaculture Resources

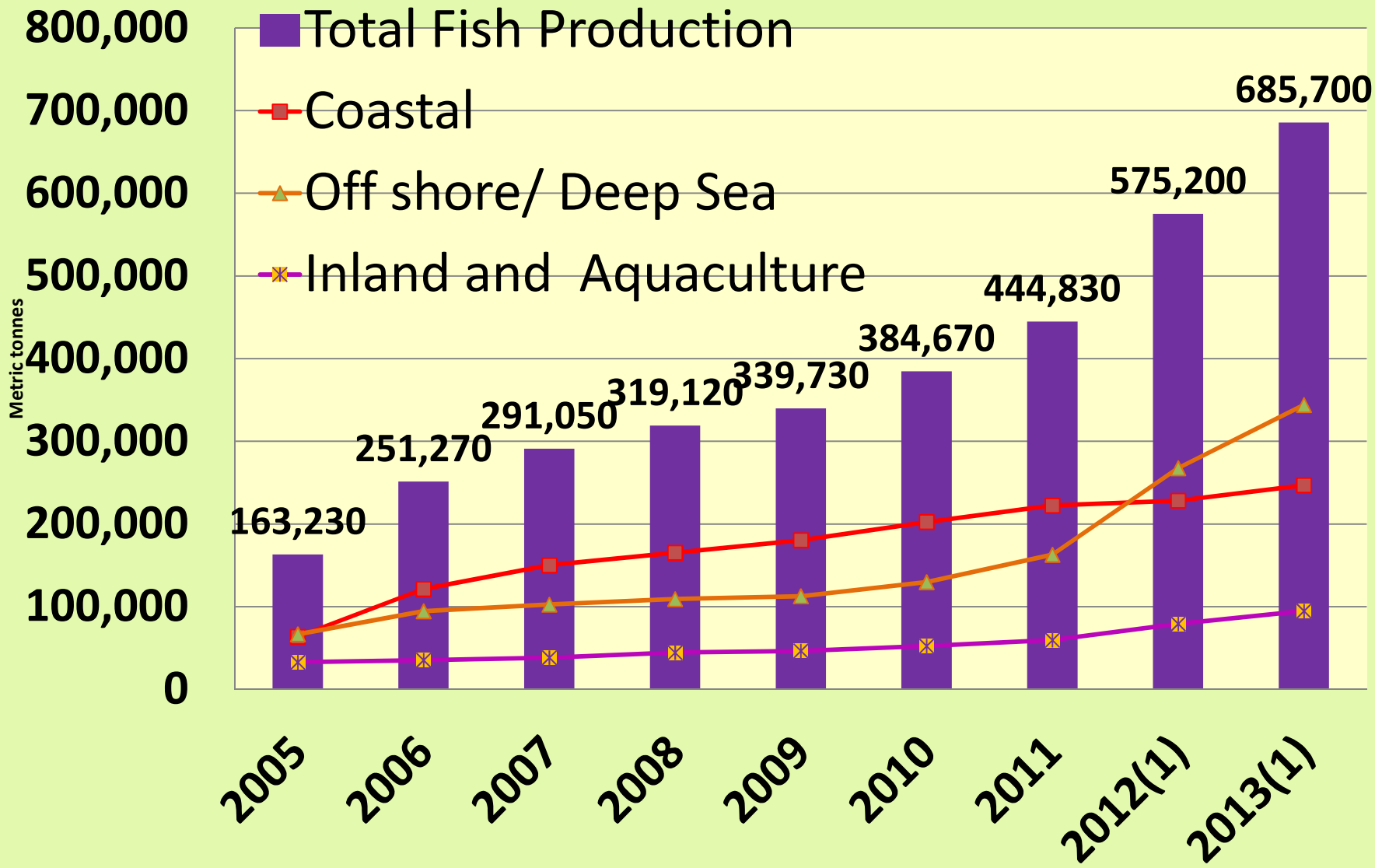
Perennial Reservoirs (hectares)
155,000

Seasonal Tanks (hectares)
100,000

No. of Minor Perennial Reservoirs
450

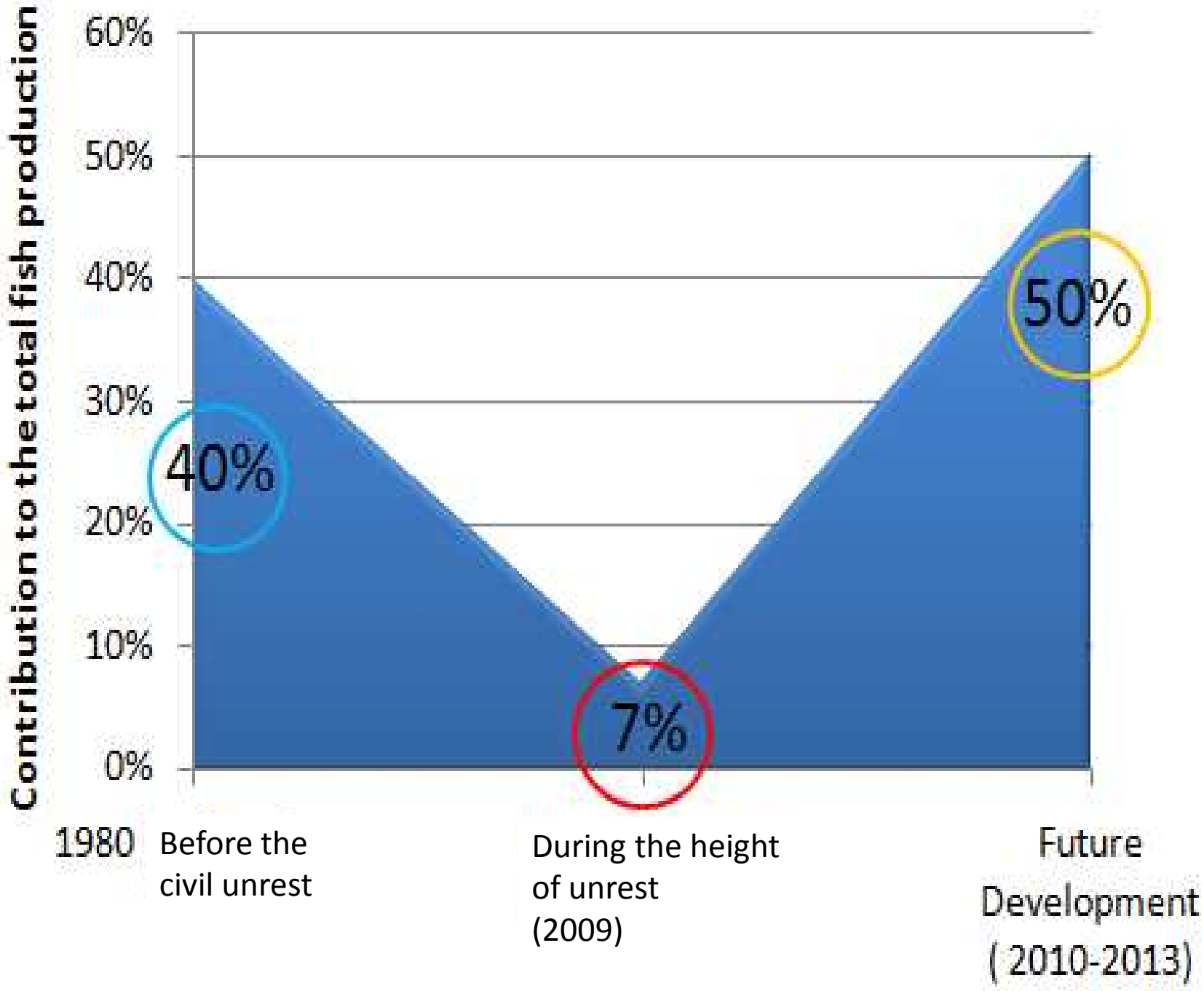
No. of Seasonal Tanks
12,000

Fish Production and Targets



Annual Fish Production (Mt) 2011

Marine Sector		**385,270**
Coastal Waters	**222,350**	
Offshore/Deep Sea Water	**162,920**	
Inland Fisheries and Aquaculture		**59,560**
Inland Capture Fisheries	**50,050**	
Aquaculture	**5,360**	
Shrimp	**4,150**	
Total Production		**444,830**


Contribution to the total fish production
60%
50%
40%
30%
20%
10%
0%
40%
7%
50%
1980
Before the civil unrest
During the height of unrest (2009)
Future Development (2010-2013)







Northern Fishery Awakening – Mulativu Distribution of fishing boats and gear for artisanal fishermen (FAO Programme)

National Fishing Fleet - 2011

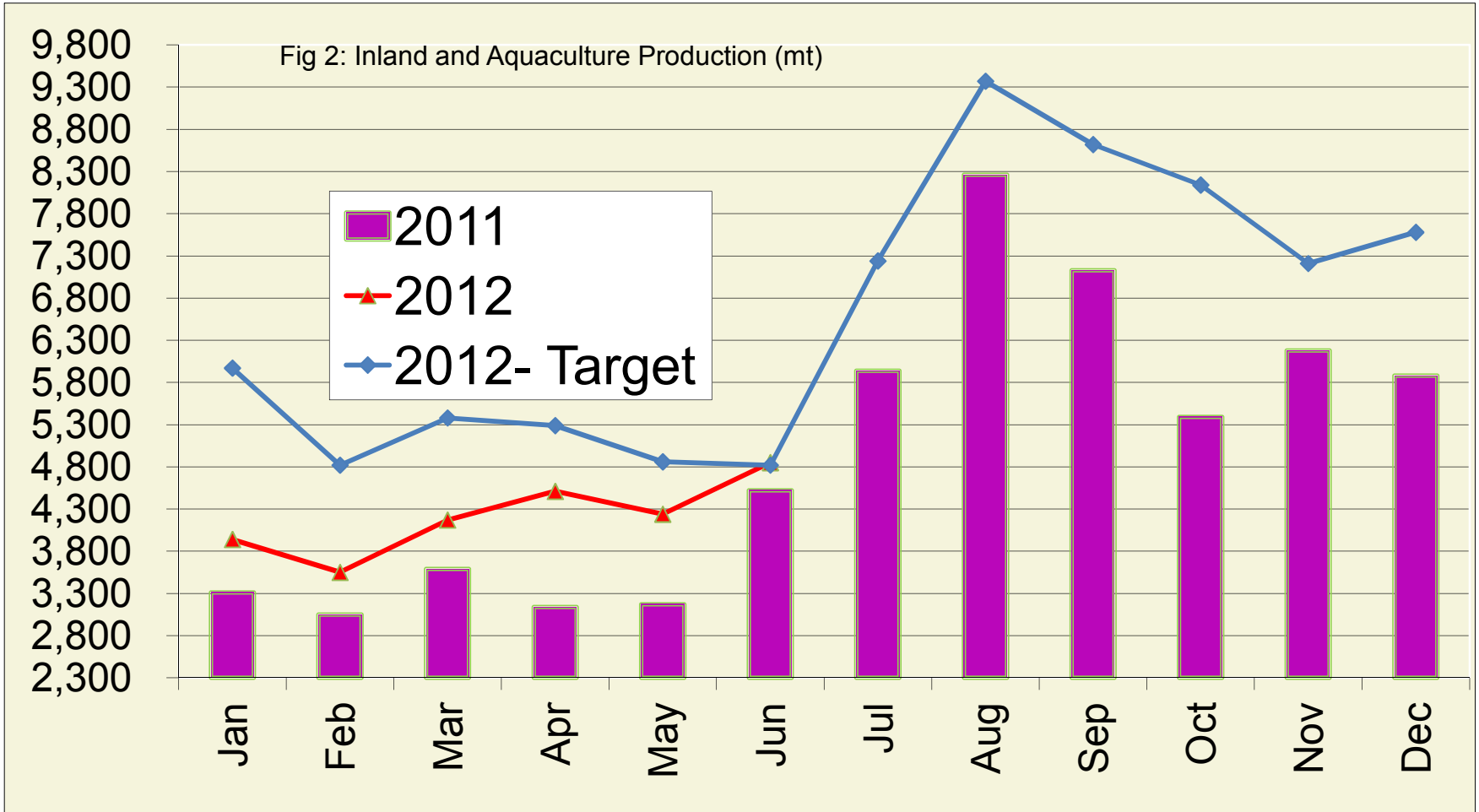
Multiday Boats –IMUL	**3,872**
Inboard Single Day Boats – IDAY	**1,120**
Outboard Motor FRP Boats – OFRP	**19,890**
Motorized Traditional Boats – MTRB	**2,960**
Non-motorized Traditional Boats	**20,430**
Total Marine Fishing Fleet	**48,272**
Beach Seines	**975**
Inland Fishing Fleet	**8,030**







Opening of the redeveloped Nilwella Fishery Harbour in the South



	2009	2010	2011	Achieved %	2012	2012- Target
Total	**46,560**	**52,410**	**59,560**	89.6%	25,260	**79,300**
Targets	48,200	55,500	66,400	19.6%		79,300

National Target of Inland and Aquaculture Production

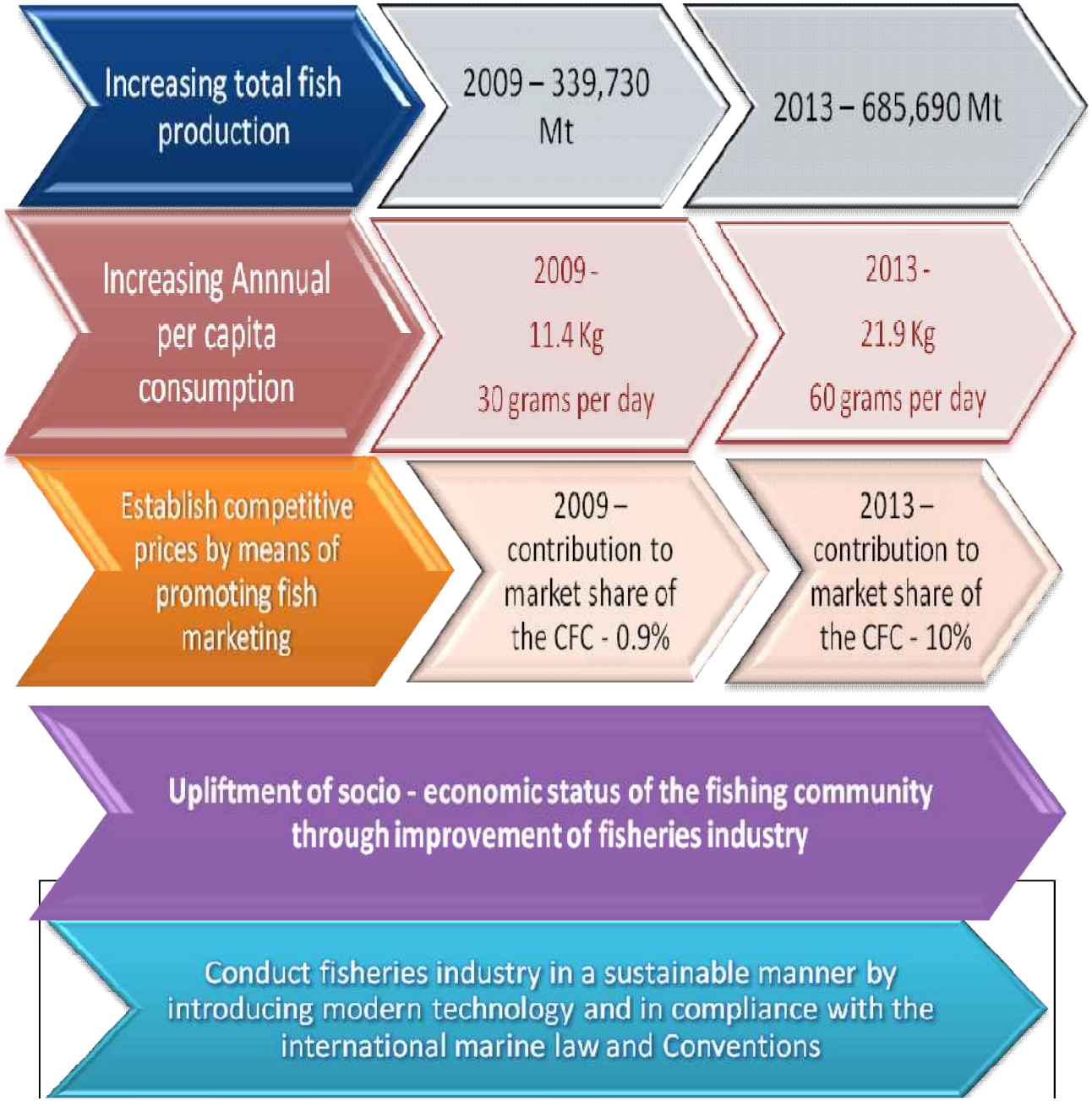






Inland Aquaculture Development Programme of Ampara in the East Coast of the country

Fisheries Sector Development way forward 2010-2013




DFAR
Strategies
Integrated awareness creation
Introduction of small scale fishing vessels
Introduction of New Multiday Long Line boats
Divi Naeguma
Re-activating inactive beach seines and inactive multiday boats
Strengthening of fisheries federation
Encourage private sector involvement
Introduction of National Fisheries Policy, introduce new policies, regulation and revision of the ACTs
Value addition
Encourage fihermen to engage in long lines CSW/RSW and quality control practices
Fisheries loans, pension scheme and insurance scheme

DEVELOPMENT OF THE DOMESTIC MARKETING NETWORK









FISH TRADE – PEROCESSING, EXPORTS & IMPORTS -2011

Fish Processing Plants (EU App.)	**25**
Fish Processing Plants (Other)	**5**
Annual Export Earnings (Rs.Mn)	**21,876 (US$190 million)**
Annual Export Volume (Mt)	**18,462**
Annual Import Expend. (Rs.Mn)	**16,239 (US$141 million)**
Annual Import Volume (Mt)	**81,958**
Balance of Fish Trade (Rs.Mn)	**5,636 (US$ 49 million)**

(1 US$ = SL Rs 115)



Export Percentage

Fish Exporting countries from Sri Lanka

European Union Countries	**- 43%**
Other European Countries	**- 03%**
Japanese market	**- 18%**
U.S.A market	**- 09%**
Others	**- 23%**

LIVELIHOOD IN FISHERIES

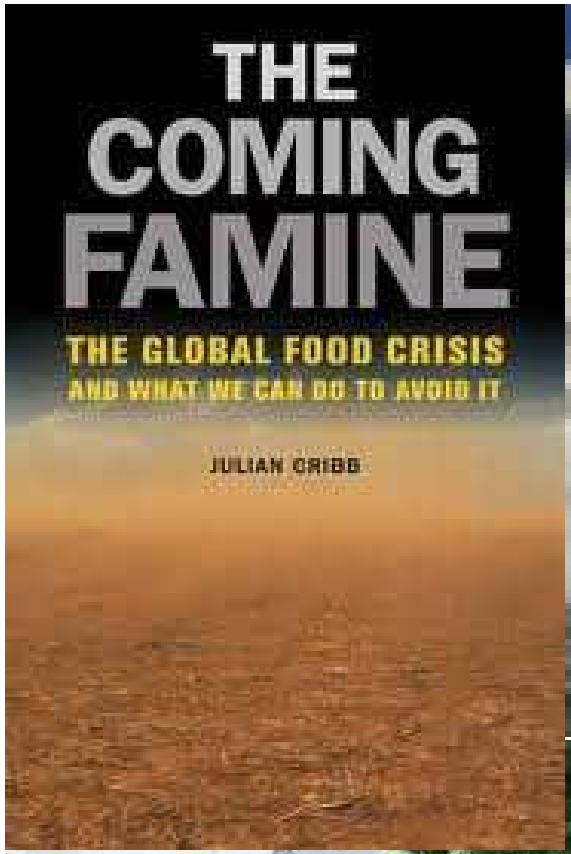
Direct Employment **220,960**

Offshore Fisheries	**38,200**
Coastal Fisheries	**111,650**
Lagoon Fisheries	**38,680**
Inland Fish. & Aqua.	**32,430**

Indirect Employment 400,000

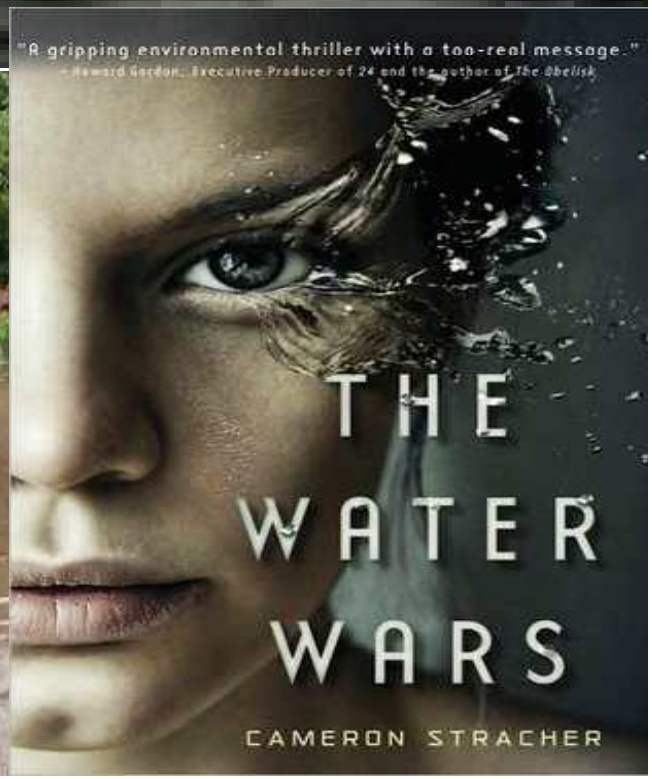
Fishing & Related Livelihoods **2.6Million**

Fisher Organizations	2010	2011	Change (%)
Fisher Organizations (FO) - Marine	622	819	32
Fisher Organizations (FO) - Inland	270	284	5
No. of Memberships in FO - Marine	46,134	70,047	52
No. of Memberships in FO - Inland	14,973	17,443	16


THE COMING FAMINE
THE GLOBAL FOOD CRISIS
AND WHAT WE CAN DO TO AVOID IT
JULIAN CRIBB


GLOBAL WARMING




"A gripping environmental thriller with a too-real message."
THE WATER WARS
CAMERON STRACHER


Click to LOOK INSIDE!
Food Wars
The Global Battle for Mouths, Minds and Markets
Tim Lang and Michael Heasman


THANK YOU
"STHUTHI"
"NANDRI"

Commercial Strategies for achieving food & nutrition security, poverty alleviation, GDP and trade

FAO Symposium – Global Fisheries Leaders' Forum
EXPO 2012 – Yeosu, Korea

Jorgen J. Lund
Managing Director
North Atlantic Seafood Forum
Norway

August 9th, 2012

Overview

One – Setting the stage

- The views from a seafood industry observer – seen from Norway perspective

Two – Visions for the Future

- World Seafood Market Outlook – seen from 2 different industry perspectives

Three – Challenges

- How to expand global Sustainable seafood supply
- Capital requirements and financing of global aquaculture expansion
- Private Sector Risk and Requirements
- The role of Governments to develop new projects

Four - Solutions

- The vital role of the private sector and capital markets
- Government and private sector cooperation – illustrative industry Business Cases
- The critical role of global seafood trade as supply expansion driver

Five – Summary and concluding remarks

One – Setting the stage

North Atlantic Seafood Forum

NASF was started in 2005 - the **8th** event will take place March 5-7, 2013

NASF - world`s largest *annual* seafood business conference
@ 100 speakers in 10+ seminars over 3 days

NASF is a leading seafood executive Meeting Place
@ 550 delegates > 350 companies > 30 countries

NASF has a global reach – business arena well recognized worldwide

Norway role @ world 2. largest exporter, leading seafood financial markets @ 20 stock-listed top seafood firms support NASF leading position

FAO became a seminar partner in 2011 – bringing 7 African coastal countries supported by Norway Ministry of Foreign Affairs grant

In 2013 - **NASF is moving home to Bergen** - the world`s seafood capital





North Atlantic Seafood Forum – Business Platform

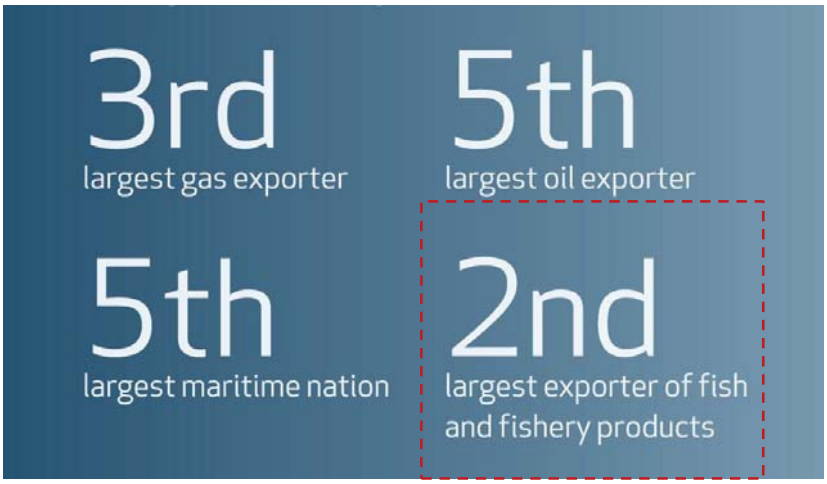
NASF: inter-phase between trade, commercialization, policy, innovation and finance/capital markets – giving key insights into the future



Since 2010 - Strong focus on sustainability @ cooperation with MSC and others

Sustainability - vital for future growth

Norway - a leading nation in Energy, Shipping and Seafood



and Oslo Børs is a preferred listing venue for an increasing number of companies representing these sectors

Source: Oslo Børs

Oslo Børs - A leading Exchange due to Norway`s natural resources



Energy

- **2nd largest in Europe** (numbers of companies)
- **2nd largest worldwide in oil service** (numbers of companies and market cap)



Shipping

- **Number 1 in Europe** (number of companies)
- **3rd largest worldwide** (number of companies)



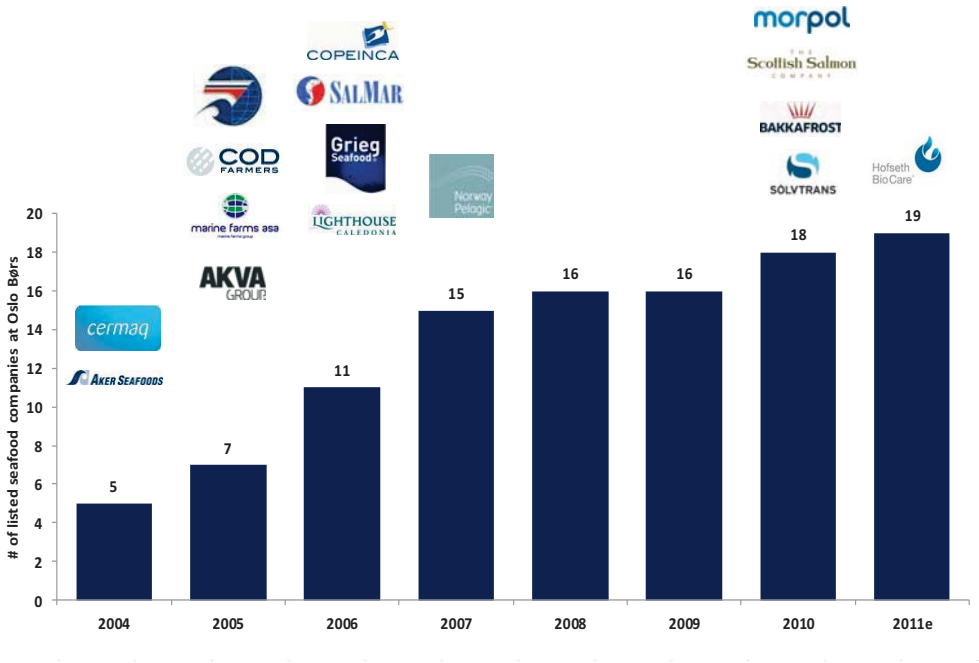
Seafood

- **Number 1 worldwide** (numbers of companies and market cap)

Source: Oslo Børs

Significant number of seafood companies listed at Oslo Børs

of listed seafood shares at Oslo Børs, 2004-2011



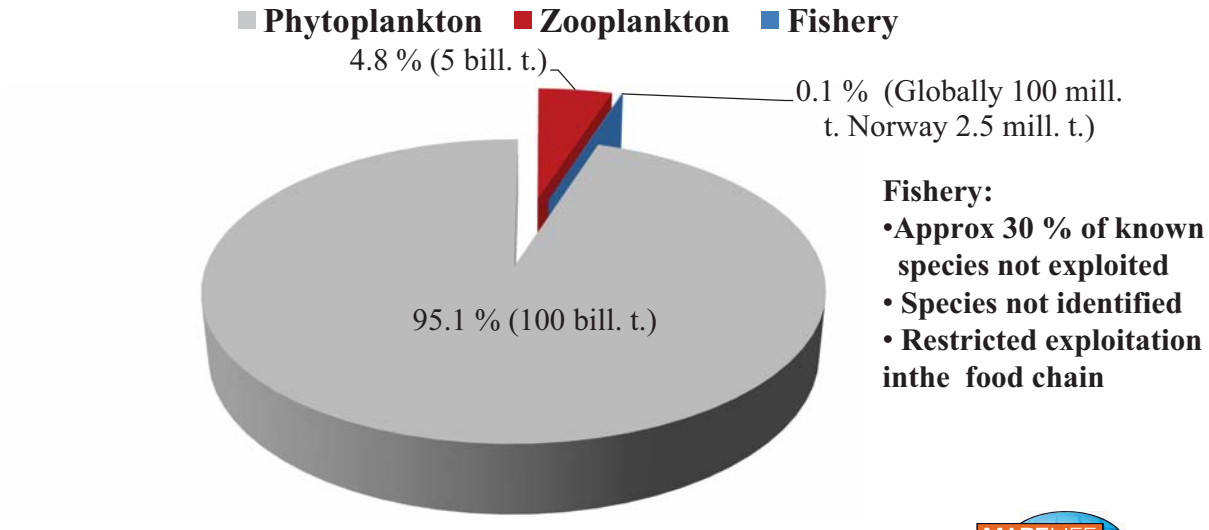
Source: Oslo Børs, Pareto

Two – Visions for the Future

Prof. Øystein Lie, Norway - BioMarine Scientist and Grunder of Genomar

«The Blue revolution» is just in the starting block

Ocean Bio Resources and Exploitation



Fishery:

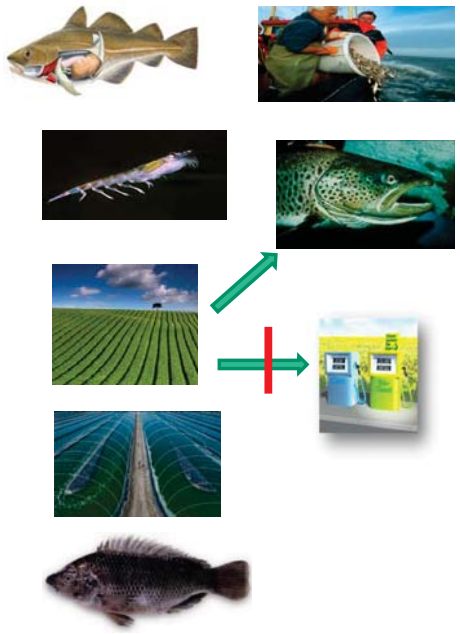
- **Approx 30 % of known species not exploited**
- **Species not identified**
- **Restricted exploitation inthe food chain**

Source: Field et al. (1998): Science, vol 281
Longhurst et al. (1995) : J.Plankt Res, vol 17

Prof Øystein Lie visions of Global seafood strategy

How to produce millions of tons new seafood supply

1. **Utilize the whole fish – reduce discards of residuals**
2. **Optimize aqua feed and Health management**
   - Reduce fish as resource
   - Use lower trophic levels
   - Crops to feed and food and not to fuel
   - Efficient vaccines and disease control
3. **Genetically advanced broodstocks**
4. **Farm «sustainable» species**
5. **Scale up algae production (for feed)**
6. **New secrets/new species from the sea**



MARELIFE BIOMARINE INNOVATION NETWORK

NORTH ATLANTIC SEAFOOD

Two – Visions for the Future

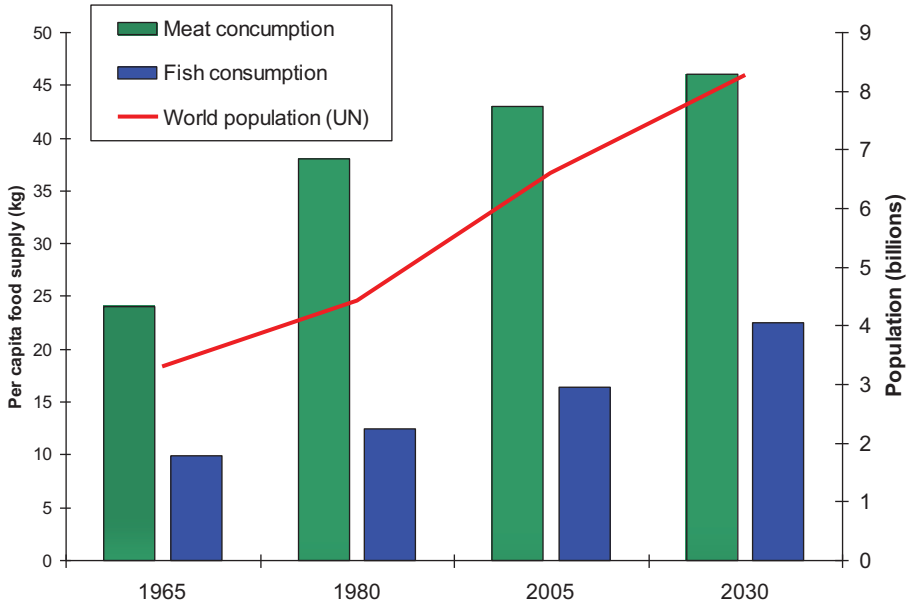
→ **The views from the world leading Capital Markets**

What do investors «see and believe in» - today ?

Pareto Securities

Pareto Corporate Finance Seafood Team
Oslo

Main Driver: Population Growth vs Food supply



Source: FAO

The increasing demand for healthy proteins will drive seafood growth

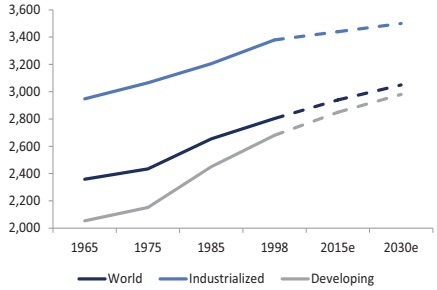
Solid long term drivers for the next decades

Demographics support higher demand for proteins

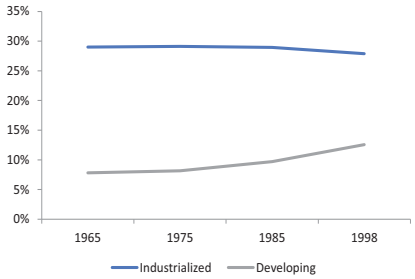


@

World per capita kcal intake is increasing…



….as well as animal protein share

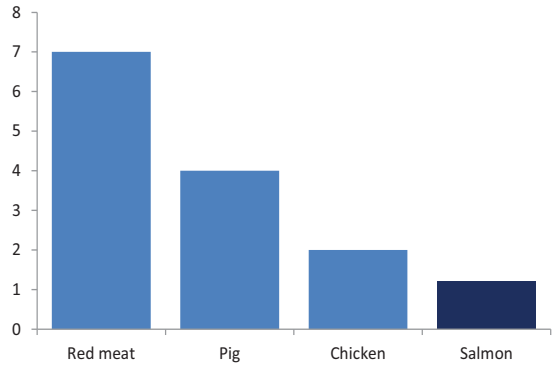


Source: Nutreco, FAO, Pareto Securities

Aquaculture is a sustainable growth story

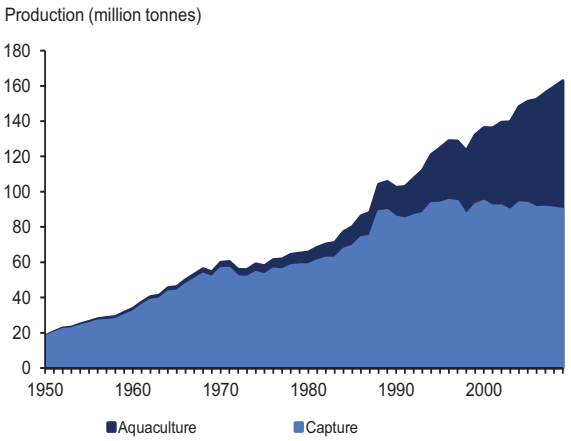
Marine fishery resources are scarce/not expanding → Demand must be supplied by aquaculture

Highly competitive feed conversion rate (FCR) – (x)



- Feed conversion rate is the amount of feed needed to produce the same amount of meat
  - Salmon has a FCR of 1.3x
  - Chicken has a FCR of 2x
  - Red meat has a FCR of 7x

Demand is to be met by Aquaculture production



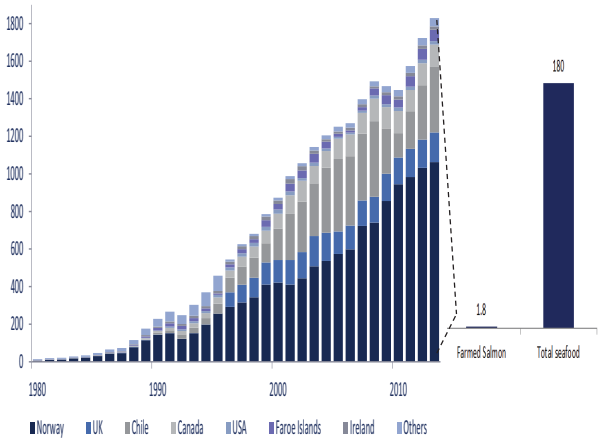
- Future demand growth will be a function of increase in per capita consumption and growth in global population
- FAO estimates global demand for fish for human consumption to double in 2030

Salmon farming - a growth industry

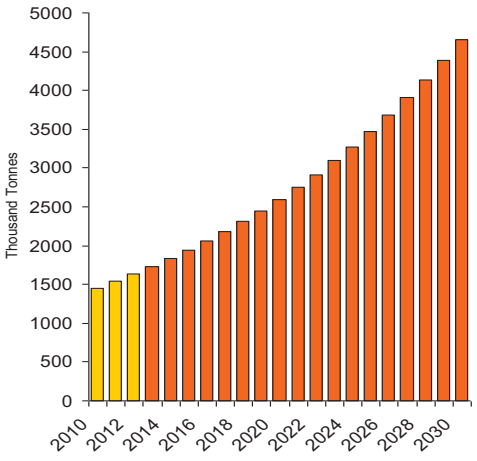
still in early stages of industry development

1990-2010 global supply Atlantic salmon +10% CAGR, +5% CAGR 2000-2012, + 6 % GAGR 2012- 2030

1980-2012 global supply



forecast 2012-2032



Salmon Farming is still ~ 1% of seafood consumption in 2012

Source: FAO, Kontali Analyse, Pareto Securities. Aquagen - Note: tons WFE (whole fish equivalents)

Three – Challenges

- ***How to expand global fisheries and aquaculture supply in a sustainable way?***
- **Contraints to a massive future global aquaculture supply expansion**
- **Capital requirements and financing of global aquaculture expansion**
- **Private sector Risks and Requirements**
- **The role of Governments: the need for stable policies and predictable long-term concessions and operating conditions**

Expected global seafood supply expansion

@ How to finance supply gap - need for capital funding

OECD-FAO forecast to 2021

- Foresees 15 % demand growth to 172 million tons by 2021
- **Supply Gap** of 16 million tons
- Aquaculture sector main supplier expanding 33 % by 2021
- China to account for 61 %, rest Asia 28 %, rest world only 11 %
- Role of China/Asia vital to meet new demands
- Seafood sector to be come increasingly globalized
- World trade to expand

Question of capital funding?

World Bank: USD 100 billion in new aquaculture investments by 2030

We envision global capital requirements ~ USD 40-50 billion by 2022

China share of investment USD 25-30 billion to be funded internally = OK

Other world capital needs USD 20-25 BN

Salmon sector – may need USD 5-8 BN

@ Private sector - key to facilitate new investments and provide risk capital

Global aquaculture expansion - Key Private Sector Risk Factors

Biological Risks: Health risks: The fish is exposed to health risk from pests, disease and toxins.

Environmental risk: Risk of product quality and traceability:

Commercial risks

- PRICES : Risk of changes in input prices - International price trends:
- DEMAND: Changes in consumption in the target markets: Changes in the economy of the consumer countries: Behavior of the global and national economy, Changes in conditions could affect the global demand for protein and salmon
- Currency Risk
- Sales and Operations risks
- Liquidity risk: salmon price volatility, raw material costs , credit risks/customer payments

Governmental Policy Risks

- Changes in legislation (aquaculture and farm site concessions policies) and related risks

Project risks - Aquaculture Farming

Working Capital Considerations - Time to reach harvestable size by key species



SALAR SALMON



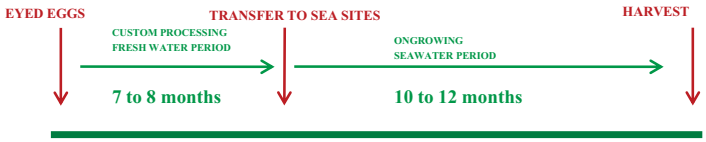
Import of eyed eggs from Iceland

100 g smolts are transferred to Farm Sites at Sea

Targeted weight at harvest: 4.5 kg.



COHO SALMON



Health certified eggs are acquired in July

100 g smolts are transferred to Farm Sites at Sea

Targeted weight at harvest: 3.0 kg.



TROUT

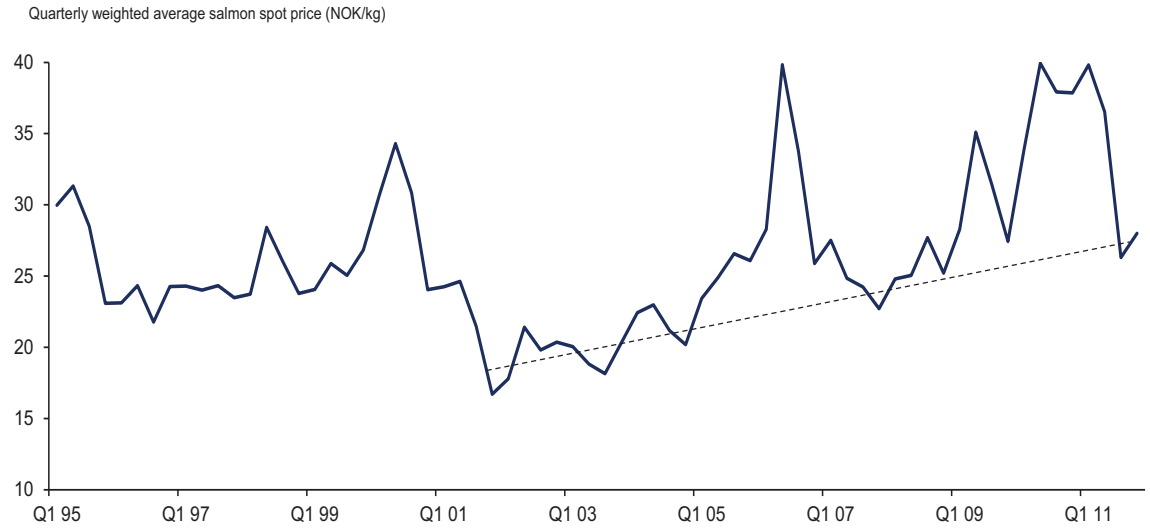


Acquisition of health certified eggs

100 g smolts are transferred to Farm Sites at Sea

Targeted weight at harvest: 2.9 kg.

Project risks - Salmon is a highly volatile commodity market



Source: FHL/NOS, Pareto Securities. Note: Q4 11 price of NOK 28 represents Pareto's price estimate.

The role of Governments: the need for stable policies and predictable long-term concessions and operating conditions

Bjorn Myrseth, leading expert and a founding father of Norway`s aquaculture industry + succesful entrepreneur, 30 years experience @ fish farming operations in Europe/Asia/Latin America

- **Salmon majors to date - cautious to enter into new areas and species - focus today on buying companies rather than undertake grass-root development projects**
- **The legal concessions frame-work must be right**

Key parameters include:

1. **Legal frame work** must be in place - and give solid predictability
2. Farming Concessions must be **long term** - minimum 20 years duration
3. Concessions must be **transferable**
4. The concession allocation, award and approval process must be **transparent**
5. **Sustainable planning of how areas are used** (ref ILA problem in Chile)
6. **Control and compliance**
7. **Government support**

Four - Solutions

Role and value-added of the private seafood sector

- Benefits of involving larger international fisheries and seafood companies
- **Key points**:
  - These firms are in general - **sustainable**
  - Most are stock-listed or large operators – subject to scrutiny from investors, analysts, lenders, regulators, NGOs and other stakeholders
  - The have high competence and know-how as operators - with very skilled organizations and managers
  - The can bring knowledge and expertise into JVs with local firms or government institutions
  - They will bring international market access and market know how
  - They have access to capital markets and project funding
  - Larger fishing companies will - in time - diversify into aquaculture sector

Business Case:

Salmon Majors - Controlling the entire value chain

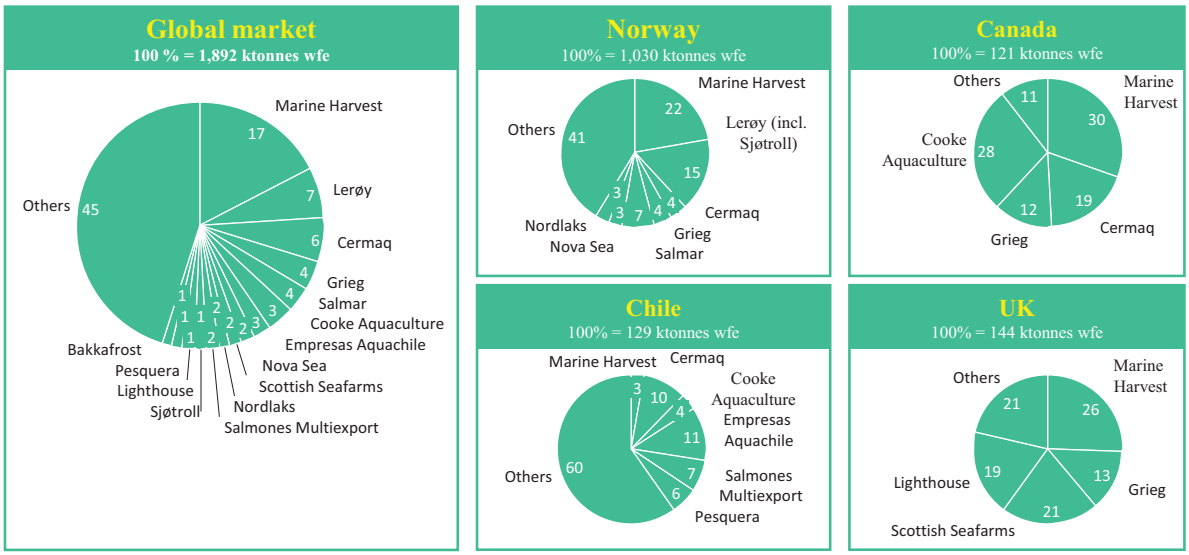


- Salmon Majors are global - and have multi-task competence
- Companies have huge technical insights and know-how in all facets of salmon farming, processing and sales & marketing
- Controlling entire value chain minimizes risks - optimizes costs and streamlines operations, giving best chances for profitable business
- One major advantage is these firms` ability and capability to handle risks and mitigate problems including large-scale incidents
- Sustainability is of critical importance in all parts of operations
- Focused on value added products
- Market Diversity: U.S., Japan, Europe, BRIC, other markets
- Market Access - sales network worldwide
- Brand developments

Salmon Industry - despite ongoing consolidation, industry fragmented

~ 40 % of world production controlled by 6 largest companies

Production of the 15 largest players globally split by region - Market share, production



SOURCE: Kontali; McKinsey analysis

Solutions

Seafood Supply Expansion - vital role public/private sector cooperation

- **Benefits of international seafood companies and investor involvement**
  - **The case for joint – ventures and direct investments**
- **Illustrative Business Cases:**
  - **Namibia – public-private cooperation and private sector JVs**
  - **Genomar – Asia telapia aquaculture business development**
  - **Vietnam and EWOS - feed supplier JV**
  - **New Frontier – Antarctic krill**

Namibia – business case

succesful public-private cooperation and joint ventures

Namibia fishing sector – history

- Since liberation some 20 years ago, Namibia has emerged as one of the most successful Fisheries nations in Africa
- **Main reason for success:**
  - Responsible government policies
  - Excellent fisheries and ocean management procedures and control
    - Norway contributor 1990-2005
    - Norway FAO Nansen EAF program
  - **Liberal attitude towards private sector involvement and joint ventures with 1st class foreign fishing companies and national firms**
  - **Major investments from national and foreign companies have secured the build-up of 1st class and viable fisheries and processing industry**

Namibia Fishing industry today

Key facts:

- **One of the largest fisheries in Africa** @ 430.000 tons/year TAC
- Main species: Hake, monk, pelagic
- **One of largest employers** @ 14.000 people in total at sea and onland
- ~ 200 vessels fish in Namibia waters
- **Export values N$ 5.0 billion (2011)**
- **Major contributor to Namibia GDP totalling ~ USD 3.0 billion/yr (4.0 %)**
- **The 2nd largest currency export earner**
- **Good position to expand international exports and trade**
- **Namibian Hake to be launched as global brand**

Namibia fishing sector

2 examples of world-class fishing companies and processors

Hangana (Namibia) wetfish hake factory in Walvis Bay



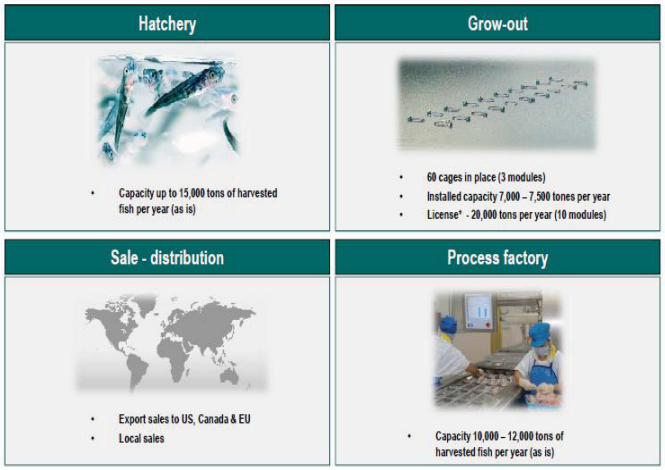
Merlus (Spain) processing sea frozen hake Walvis Bay Factory



Genomar – private sector aquaculture in Malaysia

founded by Prof. Øystein Lie 1996 – major shareholder Fred Olsen Group Norway

Value chain



Located in Malaysia



- Lake Termeggor ideal for grow-out production - Very large - 150 km2
- Highly supportive Government - 30 years license (lease)
- Contract farming
- State-of art facility and "Rolls-Royce" environmental operation

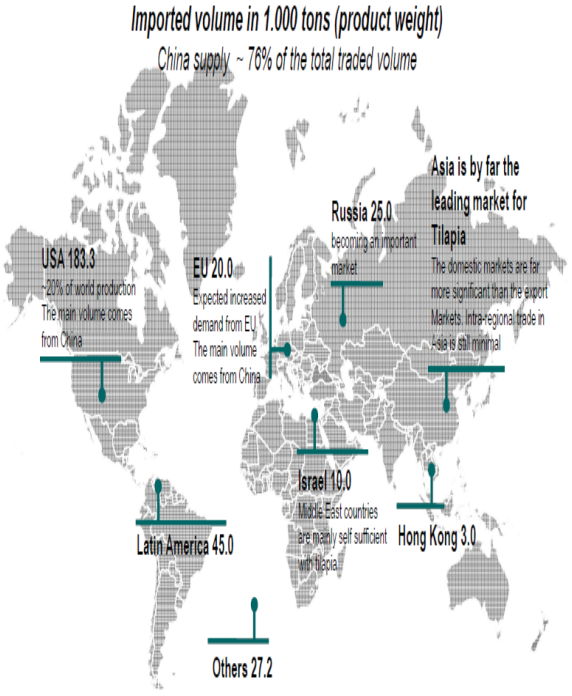
Source: Genomar

Tilapia – "the aquatic chicken" - is gaining market share

World production now exceeds 3.0 million tons/year

Tilapia Fish Farming - Upside Potential

- Among the easiest and high volume fish to farm at profitable levels
  - Very low feed conversion ratio
  - Hardiness good
- Adaptable to a wide variety of water conditions
  - Fresh water inland farmed, ponds or cages
  - Grows rapidly in low oxygen levels
- Tilapia characteristics:
  - An excellent source of high quality animal protein
  - Well suited for health-conscious and quality-seeking consumers
- Tilapia is one of the alternative sustainable source to wild caught white fish
- World trade > 300.000 tons/year!
- One of the most popular seafood items in developed countries fish and no. 5 most consumed seafood in the US market



Source: FAO, Genomar

Business Case
LDC and technical Supplier EWOS in Vietnam

Canada · Scotland · Norway · Vietnam · Chile

A World Leader in Fish Nutrition

- Operations in Norway, UK, Chile, Canada and Vietnam
- 36% share of the world salmon feed market - 1.1 mill ton sales in 2011

EWOS in Vietnam

> Knowledge transfer from salmon industry
> JV located in Long An province Mekong, 51 % EWOS owned
> Operation of factory - capacity 70.000 tons/year - 170 employees
> Significant R&D activities in place

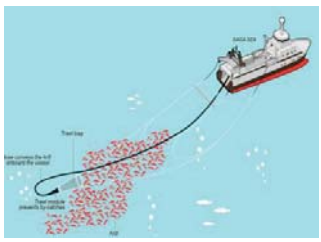
Solutions
New Frontiers for deep-sea fishing - Antarctic Krill

Aker Biomarine - integrated full value chain biotechnology company

Eco-Harvesting™	Cooperation with WWF Norway	Research on Krill
▪ Unique fishing technology invented by Aker BioMarine	▪ Developed and implemented improved operational stand…	▪ Cooperation with Institute of Marine Research (Norway) and British Antarctic Survey

High environmental standards in place

Eco-Harvesting



Processing

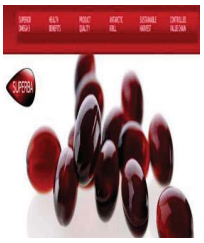


Product testing: biomarkers for human health





Marketing



AkerBioMarine

Solutions

Capital Markets – funding for future expansion

- **International capital markets and investors – much interest today in providing investments and project funding – if framework conditions are OK**
- **New Capital can be raised via IPOs, private placements, bonds, syndicated bank lending, private equity firms or by other means**
- **Governments, World Bank and other multi-government bodies may/can provide part capital - sharing some project risks**
- **Norway - an important global capital market for private sector seafood industry and project development funding**
- **Host government role as facilitator and regulator is a critical factor for foreign capital investments to encourage new aquaculture projects**
    - Policies to favor private sector development and foreign JVs
    - Grant incentives in R&D and financial support at attractive funding costs
    - Favorable tax regimes and other incentive schemes
    - Provide land and infrastructure support

Solutions

The critical role of global seafood trade expansion

- **Global seafood and fisheries trade is big business !**
- Seafood is one of the most widely traded commodities in the world, totalling ~ 57 million tons or ~ USD 125 billion in value terms per year
- Developing world will account for 2/3 of exports with Asia the major player
- World seafood trade plays a major role as income generator and contributor to economic growth, food supplies and creator of employment
- Trade fosters global cooperation, opportunities for partnerships, JVs, transfer of vital knowhow, R&D as well as capital investments
- Seafood trade will be increasingly important as a contributor to supply expansion
- OECD expects seafood sector to become more globalized driven by sustained world demand and processing/transport and logistics improvements
- World trade is expected to grow to around 65 million tons/year by 2021

Five: Concluding Remarks

- OECD - global seafood demand to expand 15 % by 2021, resulting in a supply gap of 16 million tons/year, to be met by aquaculture - largely in Asia/China.
- Seafood supply expansion will require capital investments of ~ USD 40-50 billion. By 2030, the capital investments requirements could double..!
- New aquaculture projects considered high risk - but (*location dependent*) manageable. Host governments role as regulators and facilitators vital
- Capital markets and global investors are positive to the seafood/aquaculture sector. Much investment capital is on the side-lines - stronger involvement of global institutions such as World Bank, African/Asian Development Banks/others would help
- Seafood trade continue to expand ~ 65 million tons in 2021 ~ 1/3 of future supply
- Seafood trade will be an important driver for new supply growth
- Seafood market volatility and trading conditions are seen to become more challenging, requiring more competence, size and capital
- Further consolidation to continue in white fish, pelagic and salmon markets..

Five: Concluding Remarks (2)

Commercial Strategies for securing new supplies

Large international fisheries and aquaculture companies - and major technical suppliers - can be partners with governments and local firms to make new required seafood supply expansion viable

Such firms will provide know how, knowledge transfer, market access, and risk capital - making this supply expansion viable without jeopardizing national budgets

We believe that host governments will benefit from engaging 1st class international seafood firms in win-win joint ventures and other partnership arrangements - when developing larger aquaculture projects

Visions for the future of global aquaculture

Tilapia is smart farming - Feeding the world
Saving the oceans





Many thanks for your attention !

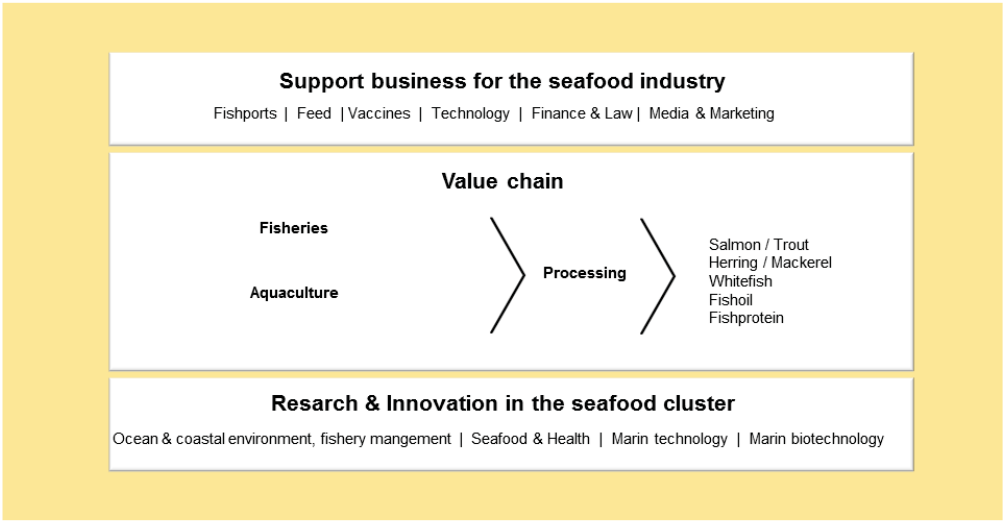
Addendum

FAO Symposium – Global Fisheries Leaders' Forum
EXPO 2012 – Yeosu, Korea

August 9th, 2012

Jorgen J. Lund
North Atlantic Seafood Forum
Norway

Seafood Cluster in Bergen



Bergen – the seafood capital

BERGEN KOMMUNE

Bergen Næringsråd
Bergen Chamber of Commerce and Industry

FFV

Pareto Securities in brief

An independent full service investment bank established in 1986

One of the largest investment banks in Norway by any measure

Focus on Norwegian capital markets combined with international presence in key sectors

~330 employees located in offices across Norway, as well as in Stockholm, Malmö, New York and Singapore

Part of the Pareto Group which also provides services such as shipbroking, project financing and asset management

Pareto Securities

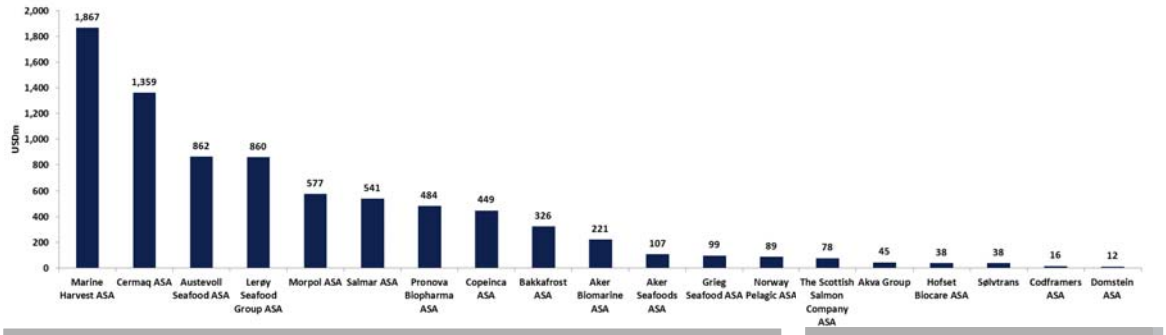
Corporate Finance & Advisory Services	Equity Capital Markets	Debt Capital Markets	Research	Asset & Contract Brokerage
▸ Financing ▸ IPOs / listings ▸ Capital management and strategy ▸ M&A and demergers ▸ Work-outs and restructurings ▸ Debt advisory	▸ Equity sales & trading ▸ Equity issuance ▸ Listed and OTC securities ▸ Block-trades ▸ Acquisition of strategic stakes	▸ Debt sales & trading ▸ Bond and convertible bond issuance ▸ Public, private and club deals ▸ Daily price run of ~150 securities ▸ FX trading & advisory	▸ Equity research ▸ Credit research ▸ Investment strategy ▸ Macro ▸ Corporate access	▸ Sale & purchase of offshore rigs ▸ Sale & purchase of shipping vessels ▸ Freight futures ▸ Commodities
▸ ~75 professionals ▸ Norway ▸ Sweden ▸ New York ▸ Singapore	▸ ~90 professionals ▸ Norway ▸ Sweden ▸ New York ▸ Singapore	▸ ~35 professionals ▸ Norway ▸ Sweden ▸ New York ▸ Singapore	▸ ~40 professionals ▸ Norway ▸ Sweden	▸ ~10 professionals ▸ Norway

~80 employees providing support and back-office services

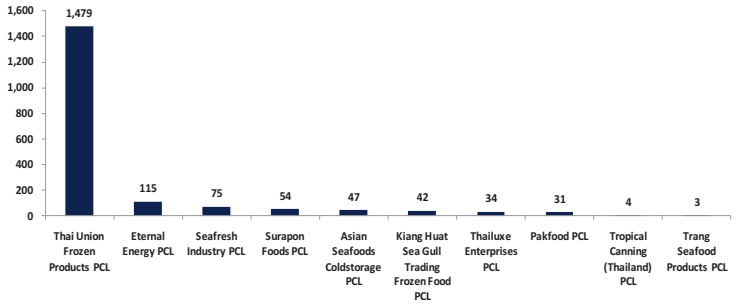
Oslo - the most attractive stock exchange for fishing companies

Market cap fishing shares: Oslo vs. selected "fish" stock exchanges

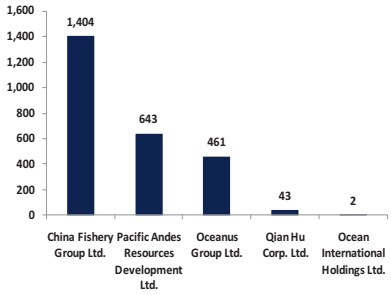
Market cap fishing shares Oslo Børs (USDm)



Market cap fishing shares Thailand (USDm)



Mcap fish shares Singapore SE (USDm)



Source: Oslo Børs, Pareto

EWOS added-value to Vietnamese aquaculture

Vietnam – world`s largest pangasius producer @ exports 1.5 mill tons/year

EWOS value-added

- **Research based feed development**
  - **Knowledge transfer from salmon industry**
- Cost effective formulations
- Quality and safety are essential for pangasius aimed for demanding international markets – EWOS Inside (fish fed with EWOS feed are safe)
- Disease prevention rather than curing – functional feeds
- Sustainable sourcing and production – in Vietnam with the same routines as other OPCO's in the EWOS family

EWOS Approach :

- Joint-venture with one local partner
- Long term commitment
- Careful entry, learn and grow
- Implement corporate CSR policy from day one
- Work with local partners and in close cooperation with the local authorities

Namibia Business case

Value added products from onshore processing factories

- Frozen hake fillets for the foodservice. Portions are value added while whole fillets are commodity
- **Hangana** also sells same VAP products directly into retail chains in Europe/USA



- Retail 'central' portions of the fillet
  - **Pescanova joint venture**



INTERNATIONAL SUSTAINABILITY UNIT

Strategies for Raising Awareness of the Contribution of the Fisheries sectors to Food & Nutrition Security, Poverty Alleviation, GDP and Trade



Inspired and led by HRH The Prince of Wales to gain consensu key environmental challenges facing the world - such as fooc security, ecosystem resilience and the depletion of Natural Capital.

- **Legacy of The Prince's Rainforests Project**
- **Sustainable Agriculture Programme**
- **Marine Fisheries Programme**

The ISU Marine Programme

- Team research from Jan 2010 – Jan 2011
- McKinsey economic analysis of food systems
- MRAG case studies of the drivers of change
- Draft Consultative Report – March 2010

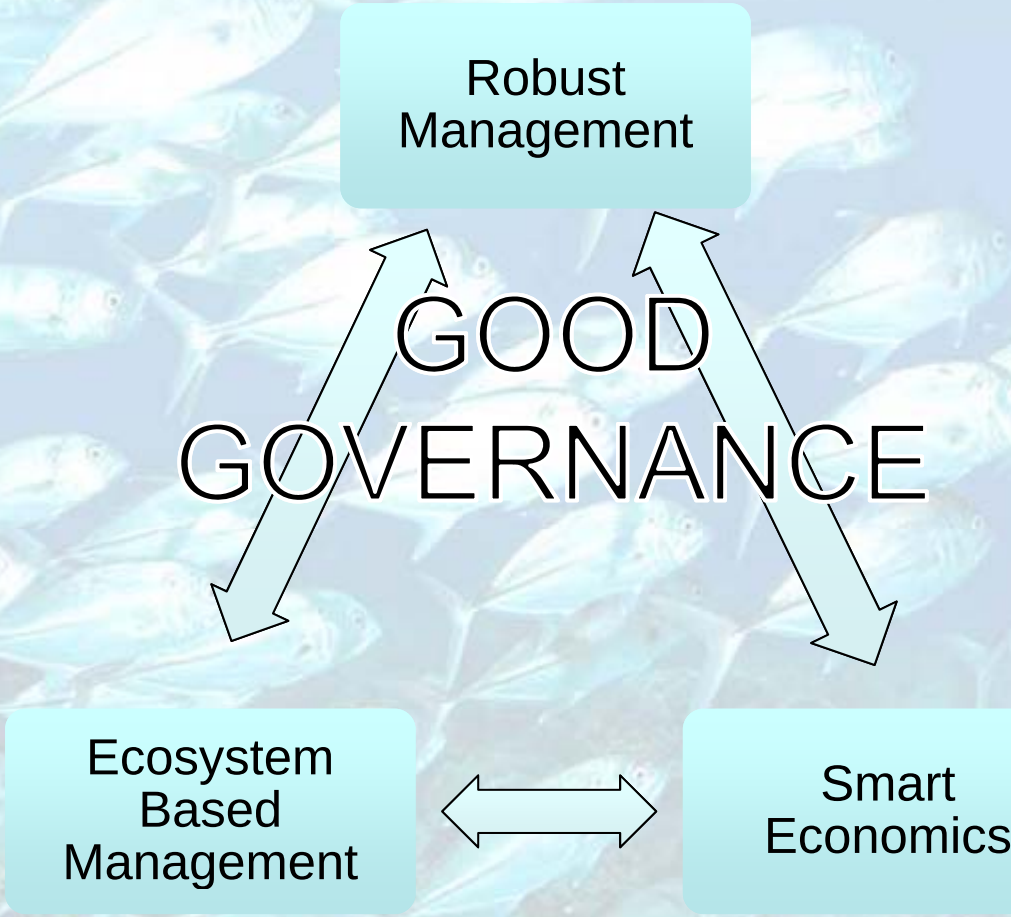
  Transitioning to Sustainable and Resilient Fisheries

The ISU Marine Programme

Transitioning to Sustainable and Resilient Fisheries

Managed sustainably, global fisheries can produce more food, increase profitability and secure employment

Sustainable Fisheries management must be based on the three pillars



The ISU Marine Programme - 2011

- **Global engagement – March to December 2011**
  is there consensus and support for our narrative (the consultation document)**?**
- **Focus on the catching sector**
- **Recruited a team of international Ambassadors fo**
  the catching sector

Our Conclusion

✓**Consensus and support for change**

✓**Optimism for the long term**

✓**A sea change**

HRH with ISU Ambassadors



Ambassadors

Australia
Annie Jarrett, Managing Director, Pro-Fish Pty Ltd

Bahamas
Mia Isaacs, President, Marine Bahamas Exporters

Canada
Christine Penney, Director, Corporate Affairs, Clearwater Seafoods

Denmark
Niels Wichmann, Chairman, Danish Fishermen's Association

The Gambia
Ousman Bojang, President, Gambia Artisanal Fisheries Development Agency

Ambassadors

celand
Kristján Þórarinsson, Federation f Icelandic Fishing Vessel Owners

ndonesia
Arianto Yohan, SVP Marketing, CP Prima

apan
Norio Koyama, President, Yokohama Coastal Fisheries Association

Mozambique
João Marcos Mangave, President, Mozambican Association of Industrial Prawn Fishing Companies

The Netherlands
Gerard van Balsfoort, President, Pelagic Freezer-trawler Association

New Zealand
George Clement, Chief Executive, Deepwater Group

Ambassadors

orway
hannnes Nakken, Managing
rector, Norwegian Fishermen's
ales Association

arties to the Nauru Agreement
aurice Brownjohn, Commercial
anager

eru
driana Giudice Alva, CEO,
ustral Group CAA

South Africa
Roy Bross, Executive Secretary, Deep Sea Trawling Industry Association

Spain
Javier Garat, President, Europeche

United Kingdom (England)
Barrie Deas, Chief Executive, National Federation of Fishermen's Organisations

Ambassadors

nited Kingdom (Scotland)
ike Park, Executive Chairman,
cottish Whitefish Producers'
ssociation

nited States of America
om Kraft, Owner, Norpac
isheries Export

eremy Brown, Fisher and board
ember, Commercial Fishermen
f America

Vietnam
Nguyen Duy Lam, Vice Chair, Binh Dinh Tuna Association

The ISU Marine Programme

f managed responsibly, wild fish stocks can play a crucial role in food security, healthier communities with more livelihood opportunities and more resilient economies.

There are already many good examples of best practice from around the world. How do we leverage these? What are the barriers to change?

Towards Global Sustainable Fisheries; the Opportunity for Transition

50 Interviews with the Fishing sector; demonstrating good practice and change in action. What are the catalysers of change?

Next Steps 2012

Continue to build on the deepening consensus of the imperative and opportunity of responsibly managed wild capture fisheries

Knowledge, awareness changing conversations

Data & Science

Transition Finance

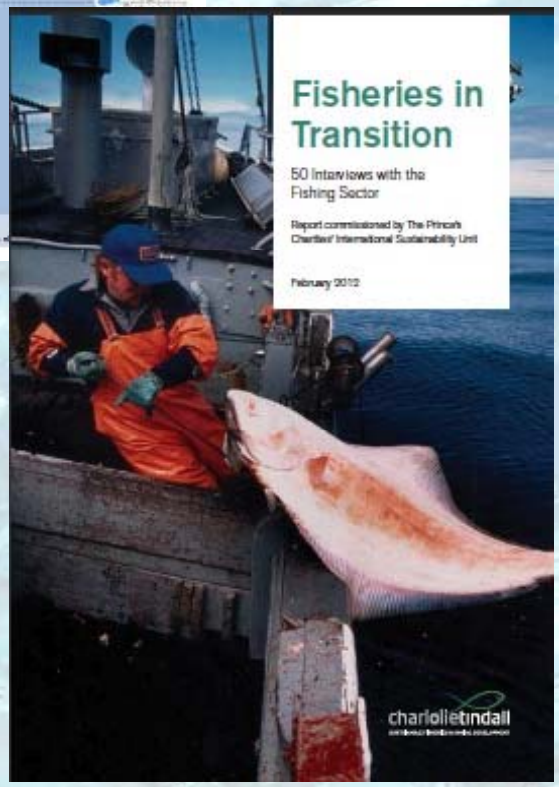
Private sector

Fisheries Improvement Projects

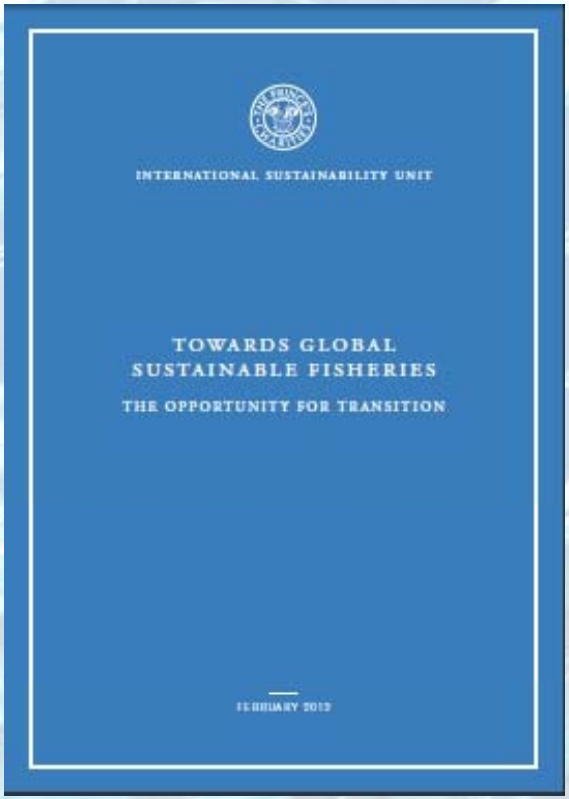


ISU can convene and can support but leadership and ownersh must come from all stakeholders





INTERNATIONAL SUSTAINABILITY UNIT



w.pcfisu.org/reports

w.princeofwales.gov.uk/speechesandarticles

melanie.siggs@royal.gsx.gov.

Raising awareness about the contribution of the fisheries & aquaculture sectors

What strategies and tactics will work?

(a Latin-American vision)



FAO International Symposium
EXPO – 2012
Yeosu – Korea
9th August 2012

By
Roland Wiefels
INFOPESCA

Antipodes Map

See the other side of the world

Original map

(-34.921971036163754, -56.162109375)

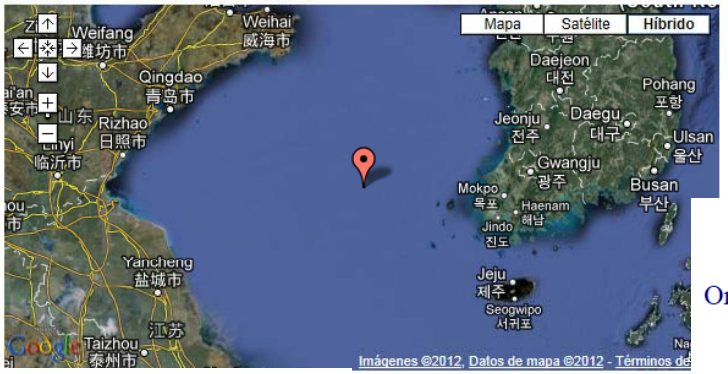
Swap locations

Antipodes of Montevideo

Antipode map

(34.92197103616377, 123.837890625)







Greetings from the other side of the world!

Antipodes Map

See the other side of the world

Original map

(34.75966612466248, 127.6556396484375)

Swap locations

Antipodes of Yeosu

Antipode map

(-34.75966612466248, -52.3443603515625)





1st Step: Diagnosis of the situation

We can observe a very positive and promising fisheries and aquaculture sector:

-The **increase** of worldwide demand for seafood

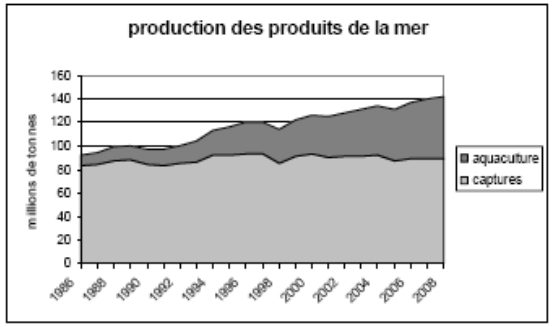
- The **increase** of worldwide production of seafood, basically through fish farming

- The **increase** of Latin American demand of seafood

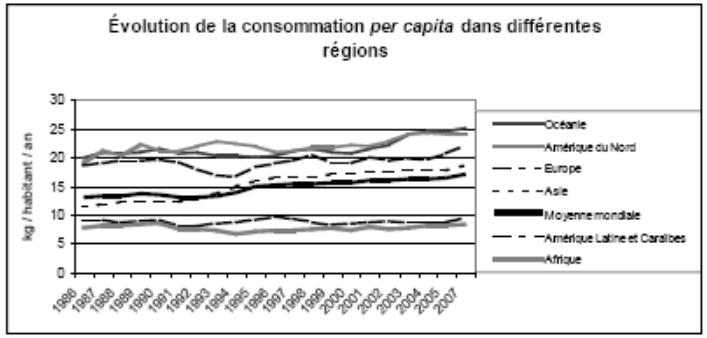
-The **increase** of Latin American production of seafood, basically through fish farming

All global curves go upwards

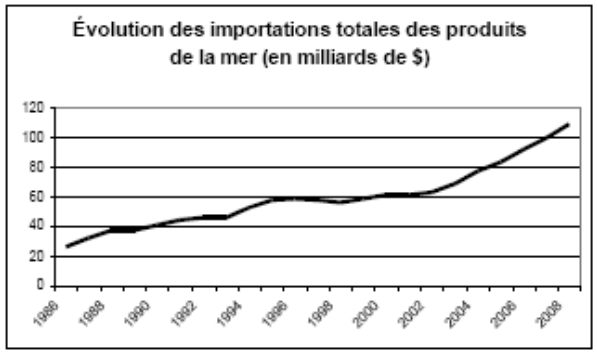
Production



per capita Consumption



Trade



2nd Step: Defining figures

Some important figures / orders of greatness about fisheries and aquaculture

World:

Seafood represents currently a business of over USD 537 billion per year (at retail level)

Average per capita consumption : 19.2 kg per year (expected by FAO for 2012)
Total 7 billion consumers

Each additional annual kg per capita consumed in the world means:
7,000,000,000 kg X USD 4.00 (average retail price) = USD 28 billion

Latin America:

Seafood represents currently a business of over USD 22.5 billion per year (at retail level)

Average per capita consumption : 9.4 kg per year*in 2009
Total 600 million consumers

Each additional annual kg per capita consumed in Latin America means:
600,000,000 kg X USD 4.00 (average retail price) = USD 2.4 billion

* Latin American countries with higher annual per capita consumption: Chile: 23 kg; Peru: 19.9 kg; Venezuela: 18.5 kg

3rd Step: Having good success stories to tell and images to show

Stories about the producers and their communities

Stories about the producing region (including geographical indications of origin)

Stories about the fishing grounds and the environment, fishermen stories

Stories about the species

Stories about cooking seafood and the nutritional benefits of the different products (Ω3…)

Stories about successful entrepreneurs

Stories about the fishermen, their communities and their fishing grounds















Stories about freshwater aquaculture

Besides traditional freshwater farming of

- Tilapia
- Colossoma
- Trout

Fish farming is developing all around Latin America with the development of farming technologies for new species











Paiche (*Arapaima gigas*)





Surubí *(Pseudoplatystoma spp.)*





Cuiú-cuiú (*Oxydoras niger*)



Some of the new species beginning to be farmed in the Amazonian region (13.445.000 Km²)

Stories about marine aquaculture

Besides traditional marine farming of

- Shrimp
- Bivalves (mussels, oysters, scallops...) and
- Salmon

Marine fish farming is developing all around Latin America with the development of farming technologies for new species

Latin America has over 50.000 km coastline





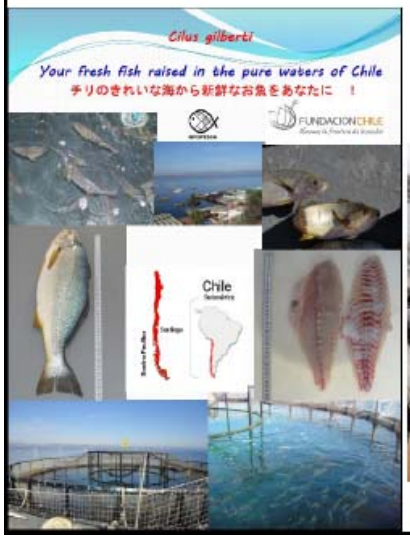
Marine farming of Cobia: Belize, Mexico, Colombia, Brazil…







Marine farming of bluefin Tuna: Mexico, Panama…



チリのきれいな海から新鮮なお魚をあなたに ！








Marine farming of *Cilus gilberti*: Chile

4th Step: Communicating

Raising awareness about the contribution of the fisheries & aquaculture sectors in Latin America

3 levels of communication:

-**To consumers:** in order to increase their seafood culture and their consumption levels
Communication through doctors and nutritionists (seafood as healthy food)
Communication through gastronomy schools and chefs (seafood as delicious food)
Communication through school canteens (seafood as an habit)
Communication through specialized agencies (COMEPESCA in Mexico, for instance)

-To investors: in order to encourage them to invest in fisheries / aquaculture
Communication through general and economics media
Communication through fisheries and aquaculture trade chambers
Communication through investment banks (BNDES in Brazil, for instance)

-To government authorities: in order to encourage them to adopt ambitious sector policies
Communication through ministries
Communication through Parliaments (fisheries / aquaculture lobbies)
Communication at provincial and municipal levels

INFOPESCA

Thank You!

감사합니다 !

Raising awareness of the contribution of fisheries and aquaculture sectors: strategies and tactics

Panel session EXPO 2012 Yeosu Korea-
FAO International Symposium
8-9 August, 2012



Simon Funge-Smith
Food & Agriculture Organization of the United Nations
Regional Office for Asia and the Pacific, Bangkok, Thailand

Global contribution of fish to the diet

- Fish production and consumption are massive contributors to global food and nutritional security.
- Fish provides about **3 billion** people with at least 15 **%** of their intake of animal protein
  - Of them **1.5 billion** people with **over 20%** of animal protein.
- Differences among developed and developing countries
  - Fish provides **19.2%** of animal protein in developing countries
  - Fish provides **24%** animal protein in LIFDCs
- Beyond this, as we heard yesterday, **fish proves dietary quality and nutrients** that have fundamental implications for our health and development…
- ..so even minor amounts of consumption may be critical for our development.



Fish production is often overlooked or undervalued in national food policy

- It seems that this contribution is often overlooked in food security and agricultural policy development!
  - The spotlight is often shone on cereal and grain security "rice security",
  - Often a simplistic approach to calories in the diet or total protein, irrespective of its origin.
- The real nutritional implications of a good diet (and hoe fish can contribute) remain slow to spread.
- In the developed world we entrust our diets largely to industrial food production and marketing systems
  - These provide safe food
  - do not necessarily ensure our diets are balanced
  - through aggressive advertising, may even encourage us to make poor food choices.



Environmental criticisms of fishery and aquaculture often overstated

- Wild capture fisheries and aquaculture are a popular focus of criticism from environmental advocates.
  - Land-based agricultural and food production systems have already irreversibly changed their ecosystems,
  - The hope is that the seas and inland waters could be protected from change.
- Whilst overfishing is a threat to marine resources
  - there are equally grave threats from habitat change and land based pollution
  - These pose equal threats to the marine and freshwater environment.
- These do not attract a similar level of attention
  - their causes are grounded in terrestrial agriculture, land use changes, population growth and urbanization and industrialization
  - Too difficult for environmental advocacy



Result is a misdirection of public opinion

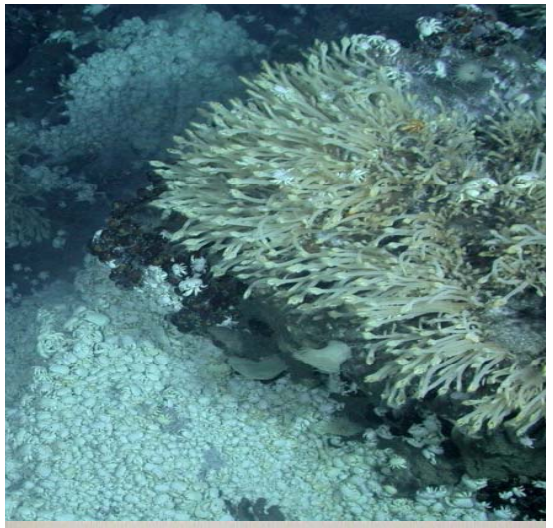
- Global public impression of fisheries and agriculture as unacceptably damaging to the environment
- Elsewhere, developing country policy focusses on cereal food security
  - fisheries/aquaculture are largely irrelevant in terms of food security and nutrition!
- Both perspectives allow us to assume that these production systems could be:
  - stopped in favour of conservation
  - or lost through pollution/degradation
  - without really affecting the worlds food supply and nutrition….!!



In this global context of:

- Consumer ignorance
- Increasing health problems in the developed world
- Continued food and nutritional insecurity in developing world
- Policy blindness overfocussing on quantity not quality
- Changing dietary habits as a result of urbanization

- How can marine and freshwater fisheries resources be given the same level of importance as other food production systems?
- Can we balance food production with sustaining the ecosystem services that underpin this?
- How do we challenge public ignorance of the benefits of wild capture fisheries and aquaculture?
- How do we cultivate an appreciation of the nutritional value and benefit of fish as food (rather than as feed for other livestock!)?
- How we improve understanding of the ecosystem services that support these food production systems?







How do we change this global perspective and how can we create the political will and public awareness necessary to drive this?

- My panelists today are:
  - Myung-Saeng Joung, (Director, Fisheries Resources Department, Korea Maritime Institute, Korea)
  - Terence Loveday, Director of Seafood Solutions
  - Roland Wiefels, Director of INFOPESCA,
  - Jun-Suk Kwang, Director General of the Distant Water Fisheries Cooperation Bureau, MIFAFF, Korea

- Each of these panellists will provide a different perspective on how these challenges could or should be addressed.













MILLENNIUM DEVELOPMENT GOALS IN FISHERIES AND AQUACULTURE

Árni M. Mathiesen
Assistant Director General
Fisheries & Aquaculture Department
Food and Agriculture Organization of the United Nations
Rome, Italy











Millennium Development Goals

1 ERADICATE EXTREME POVERTY AND HUNGER

Our cookstoves are energy efficient, freeing up families to dedicate more time to income-generating and educational activities that will help them break the cycle of extreme poverty.

2 ACHIEVE UNIVERSAL PRIMARY EDUCATION

Energy efficiency means less biofuels are needed for the cookstoves. Children, whose chores are often to gather wood, will be able to spend more time concentrating on their studies.

3 PROMOTE GENDER EQUALITY AND EMPOWER WOMEN

Women are one of the most affected by the toxic smoke from stoves. Our cookstoves will not only improve their health, but reduce time spent gathering wood. We consult with women head of households and encourage them to participate actively in decision-making.

4 REDUCE CHILD MORTALITY

Half of all deaths among children under age 5 from acute lower respiratory infections are due to indoor air pollution. We're eliminating the toxic gases inside homes with our cookstoves, and we're also reducing the number of accidents children have as they cut and gather wood.

5 IMPROVE MATERNAL HEALTH

Since they're the ones laboring and cooking over old smoky stoves, mothers will be one of the first to benefit from our cookstoves. Our cookstoves eliminate indoor pollution, improving maternal health and the whole family's health.

6 COMBAT HIV/AIDS, MALARIA AND OTHER DISEASES

Our clean stoves prevent the number of illnesses caused by toxic smoke including emphysema, lung cancer, cardiovascular disease, and lower respiratory infections.

7 ENSURE ENVIRONMENTAL SUSTAINABILITY

Our efficient cookstoves require less fuel. This translates to less deforestation, pollution, and climate change. Our tree planting campaign also encourages families to plant trees.

8 A GLOBAL PARTNERSHIP FOR DEVELOPMENT

We're not doing this alone. Our partnership with local community leaders, health workers, families, and individuals like you is what makes Project Cookstoves possible.











CONTENT :

- Nutrition
- Supply/ demand of fish
- Aquaculture
- Capture Fisheries
- Gender











Food and Nutrition security

1 billion hungry

-18,4 kilos per capita

-primary source of protein for 17% of world population

1 billion nutritionally deficient

1 billion overconsumption











Nutrition

Protein quality- growth
Omega3-brain development
Micronutrients-various deficiencies-perfect package

First 1000 days
Maternal and child health
Learning ability
Stunting-cannot make up



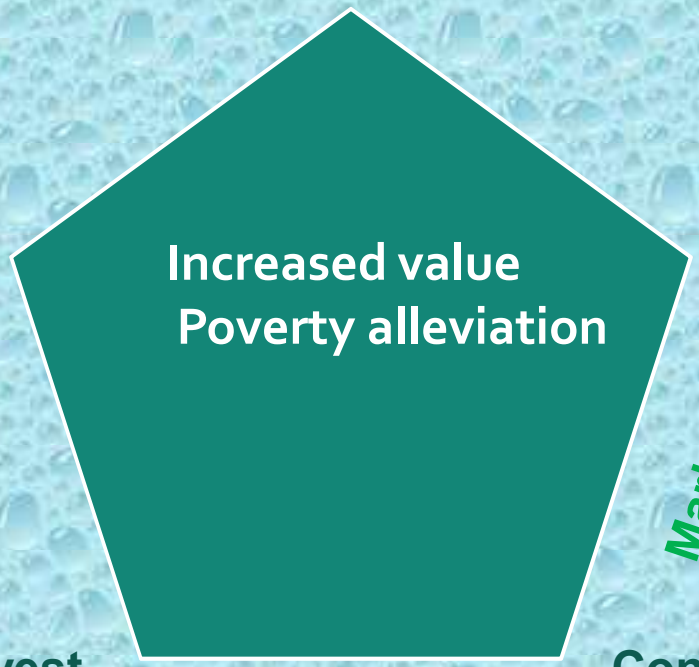

I am a BMU member
My Boat is registered
I fish legally







Value Chain:


Transport & Storage
Food safety
Quality
Post-harvest
Increased value
Poverty alleviation
Distribution
Marketing
Harvest
Consumption





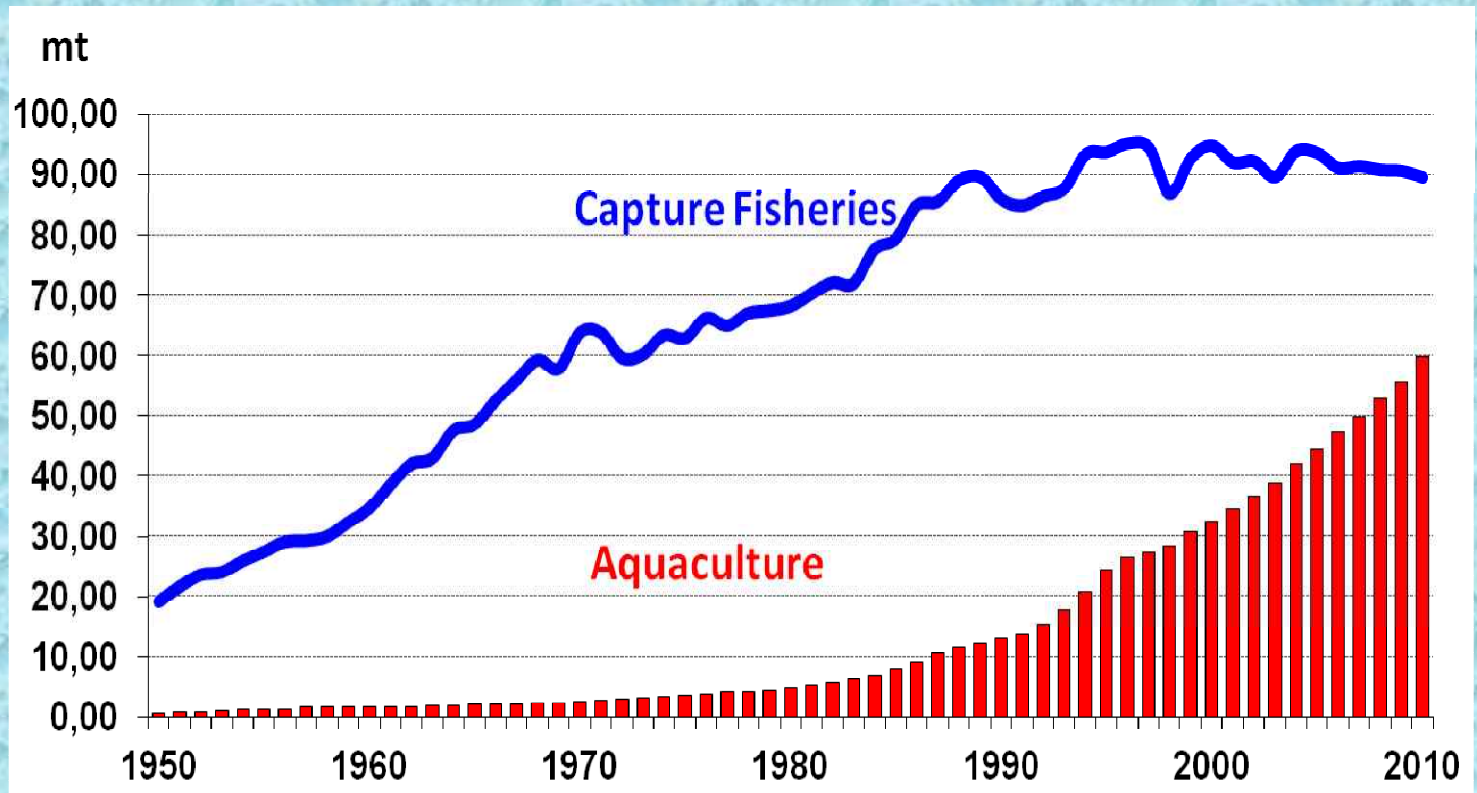






Supply/demand of fish

Trends in fish supplies







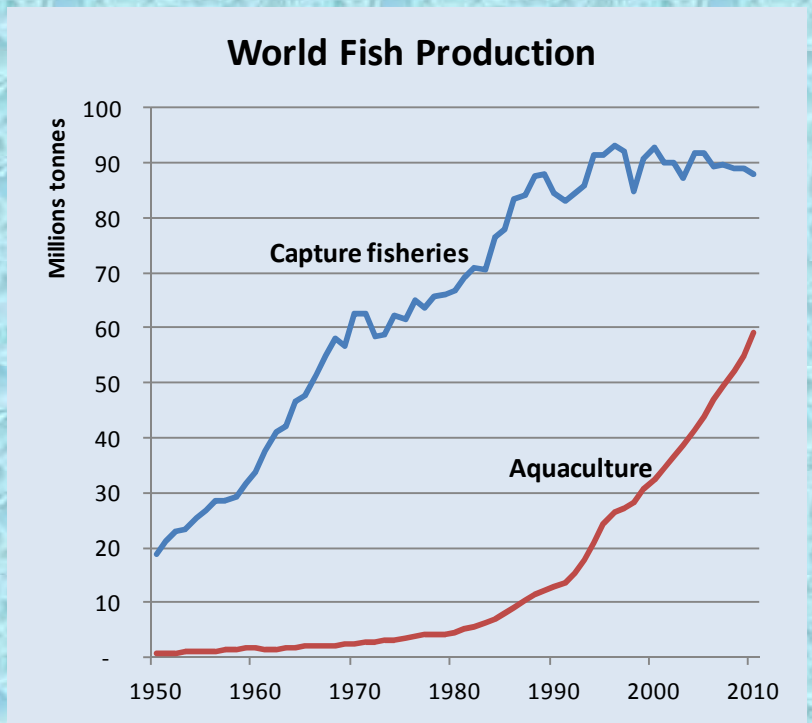






Fish supply

Fish supply (mt)	2010 (baseline)	2030 (projection)
Aquaculture	59	123
Capture fisheries	88	88
Total supply	**147**	**211**
% of aquaculture:	40	58
Source: Estimation of FI Department		



- Aquaculture follow recent trend
- Capture fisheries remain stationary
  → 211 million tonnes fish in 2030

Is the supply enough to feed future population?



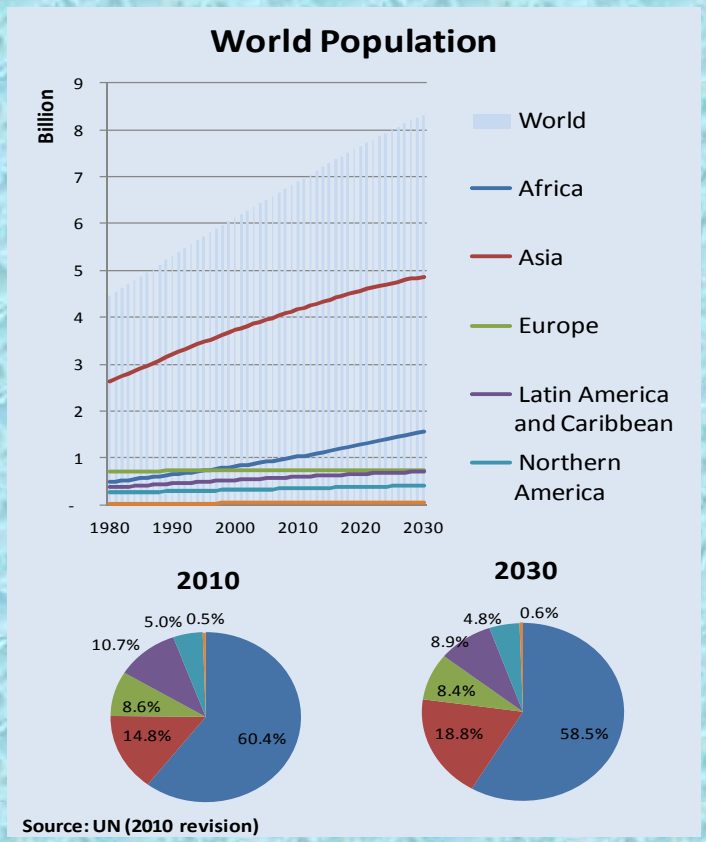








Fish demand
population growth only



Fish Demand (mt)	2007 (baseline)	2030 (projection)
Africa	9.0	14.0
Asia	86.4	96.3
Europe	19.4	19.9
L.A. & C.	15.2	16.4
Northern A.	9.1	10.7
Oceania	1.1	1.4
World	**140.3**	**158.8**
Source: Estimation of FI Department		

- To maintain baseline consumption in every country, 159 million tonnes of fish needed to feed world population in 2030.
- Total supply (211 mt) > Total demand (159 mt)



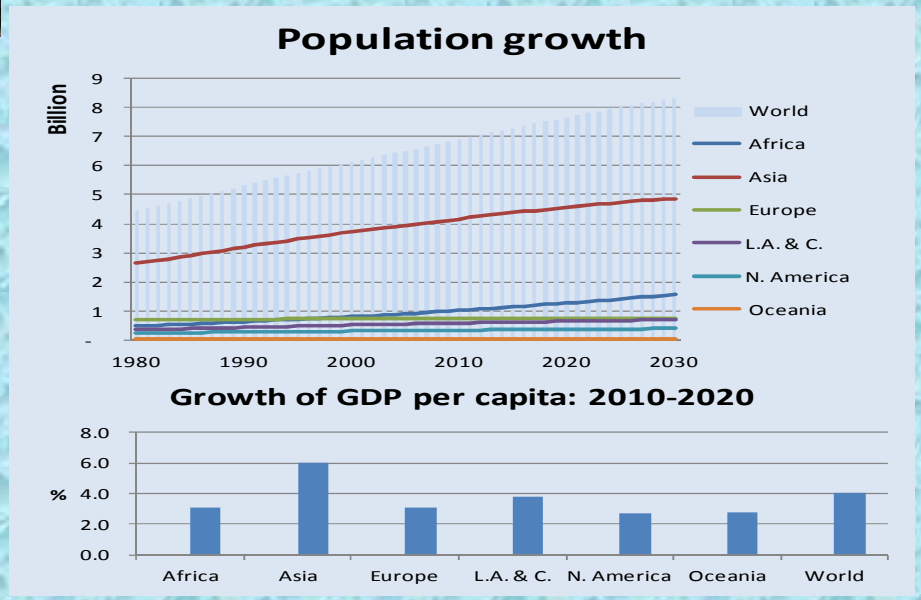








Fish demand
driven by population and income growth



Fish Demand (mt)	2007 (baseline)	2030 (projection)
Africa	9.0	18.7
Asia	86.4	186.3
Europe	19.4	23.4
L.A. & C.	15.2	18.3
Northern A.	9.1	12.9
Oceania	1.1	1.8
World	**140.3**	**261.2**
Source: Estimation of FI Department		











Fish supply-demand gaps

S-D gap (mt)	Supply 2030	Demand 2030	S-D gap 2030
Africa	11.7	18.7	-7.0
Asia	156.5	186.3	-29.8
Europe	18.6	23.4	-4.8
L.A. & C.	16.2	18.3	-2.1
Northern A.	6.2	12.9	-6.6
Oceania	1.5	1.8	-0.3
World	**210.7**	**261.2**	**-50.6**

Source: Estimation of FI Department

- **Per capita fish demand in 2020 estimated based on assumptions:**
  - –GDP per capita projection by IMF
  - –Prices unchanged
  - –Preference unchanged
- **Total fish demand in 2030 estimated based on:**
  - –Estimated per capita demand in 2020.
  - –UN population projection in 2030.
  - –Non-food fish demand unchanged
- **Results:**
  - –Supply < Demand
    - **•51 mt shortage**
  - –S-D gaps decline in all regions
    - •Largest insufficiency in Asia





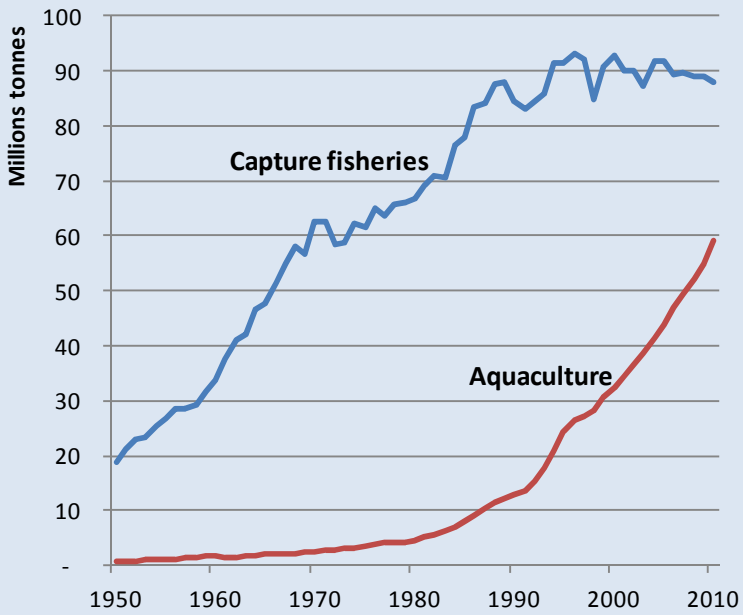






Fish supply – demand

Fish supply - demand(mt)	2030 (supply projection)	2010 (baseline)	2030 (demand projection)	GAP
Aquaculture	123	59	?	?
Capture fisheries	88	88	?	?
Total supply	**211**	**147**	**262**	**51**
% of aquaculture:	40	58	?	?
Source: Estimation of FI Department				



- Aquaculture follow recent trend
- Capture fisheries remain stationary

➔211 million tonnes fish in 2030

Is the supply enough to feed future population?
NO!





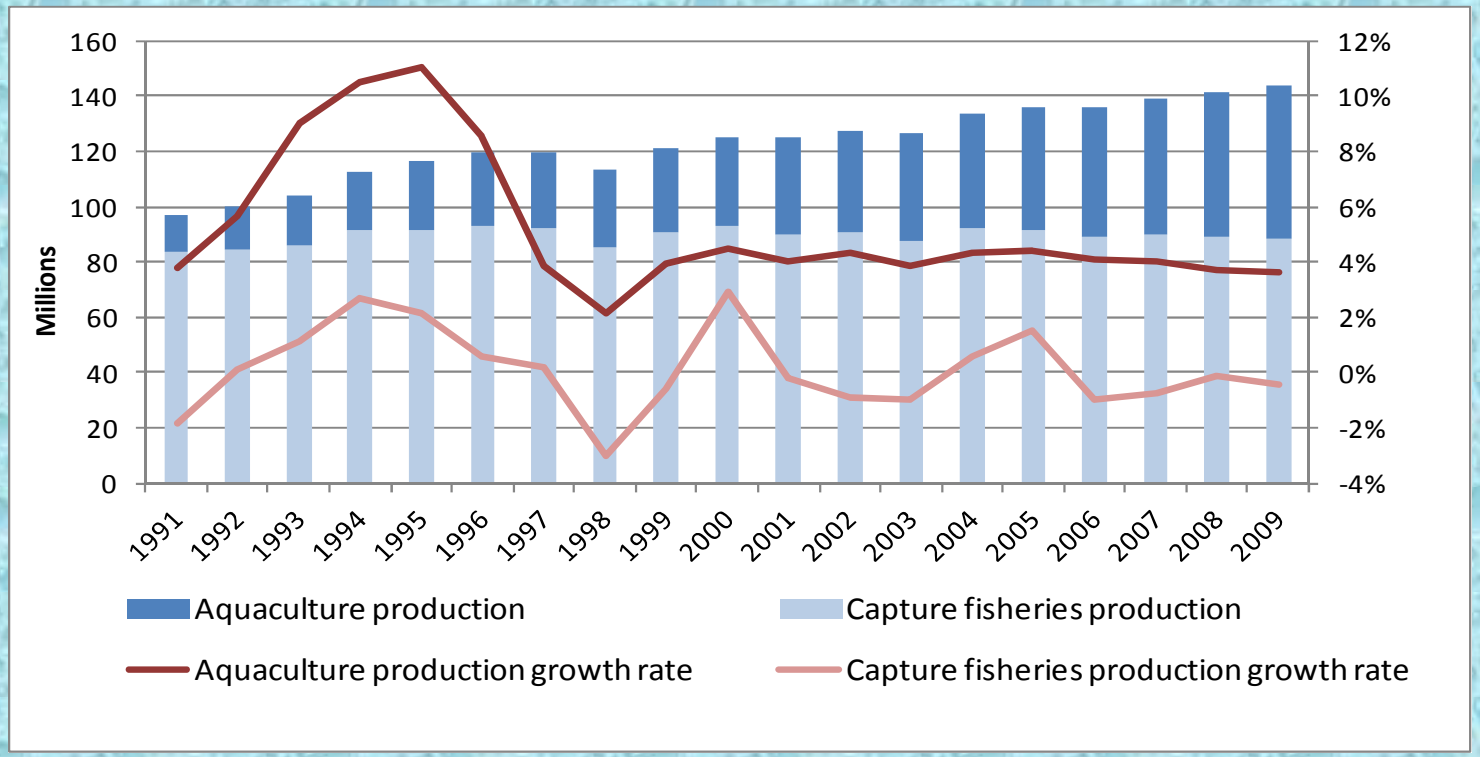






Aquaculture

Aquaculture growth rate is declining!













Bridging the supply-demand gaps

Aquaculture growth rate during 2007-2030	Expected APR (%)	Required APR (%)
World	**4.0**	**5.6**
Africa	7.2	11.5
Asia	4.0	5.3
Europe	3.1	4.0
L.A. & C.	4.4	7.6
Northern A.	0.4	9.0
Oceania	2.6	7.9
Source: Estimation of FI Department		

- If countries aquaculture production follow the recent trend, expected aquaculture growth rate:
  - –4.0 percent annually.
- To feed growing and wealthier world population, required aquaculture growth rate:
  - –5.5 percent annually.
- Improved capture fisheries 10-20 mill. t.
- ➔ -ca. 5.0 percent annually

➔ Avoid insufficiency ➔











Aquaculture challenges to avoid insufficiency

General

-Land and water
-Cost and energy efficient productivity
-Ecosystem impacts
-Technology and knowledge
-Biosecurity and health
-Finance and investment
-Conducive policies

Special

-Feed- protein and omega3s
-Non-fed aquaculture
-Low input-(fresh water)
-High input- income generation-(marine)











What do we need to do?

- Global programme for advancing aquaculture.

- FAO, other UN agencies, other IGOs, IFIs, NGOs, Private sector.

-Coordination, Solutions, Incremental finance.

- Global fund for new initiatives and innovations.











Capture Fisheries













Improved Fisheries Governance
CC-EAF













Gender

- 650 million people rely on fisheries for their livelihoods
- Half of them are women
- Precarious existence for many
- Unjust
- No economic sense
  - -Mainstreaming
  - -Small scale fisheries guidelines
  - -Tenure guidelines











THANK YOU

국민과 함께하는 선진원조

KOREA's Efforts for Poverty Reduction

Presented by Dr. CHANG Hyun-sik
Vice President of KOICA

KOICA
Korea International Cooperation Agency

WORLD FRIENDS KOREA

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I. Korea's ODA System & Policy

II. Korea's Development Experience

III. Capacity Development

IV. Economic Development

V. Social Development

VI. KOICA's Plan for Aid Effectiveness

국민과 함께하는 선진원조

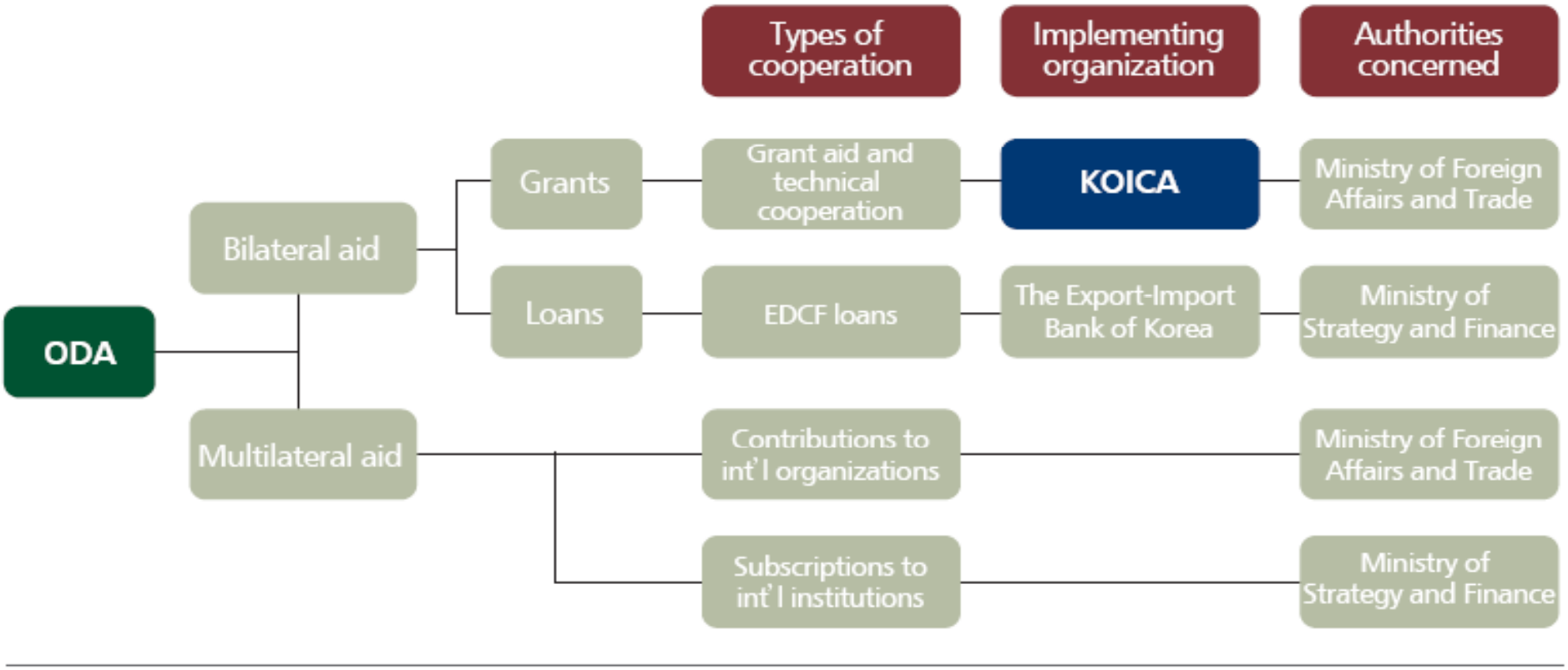
I. KOREA'S ODA SYSTEM & POLICY

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I. Korea's ODA System

Organizational Structure of ODA



I. Korea's ODA Policy

Philosophy of Korea's ODA

ODA Law (2010)

- Poverty reduction of developing countries.
- Enhancement of human rights of women and children, and realization of gender equality.
- Realization of sustainable development and humanitarianism.
- Promotion of economic cooperation with partner countries.
- Peace and prosperity of international community.

I. Korea's ODA Policy

Principles of Korea's ODA

❖ Combine development needs of partner countries and accumulated assets of Korea

❖ Maximize aid effectiveness by integrated approach

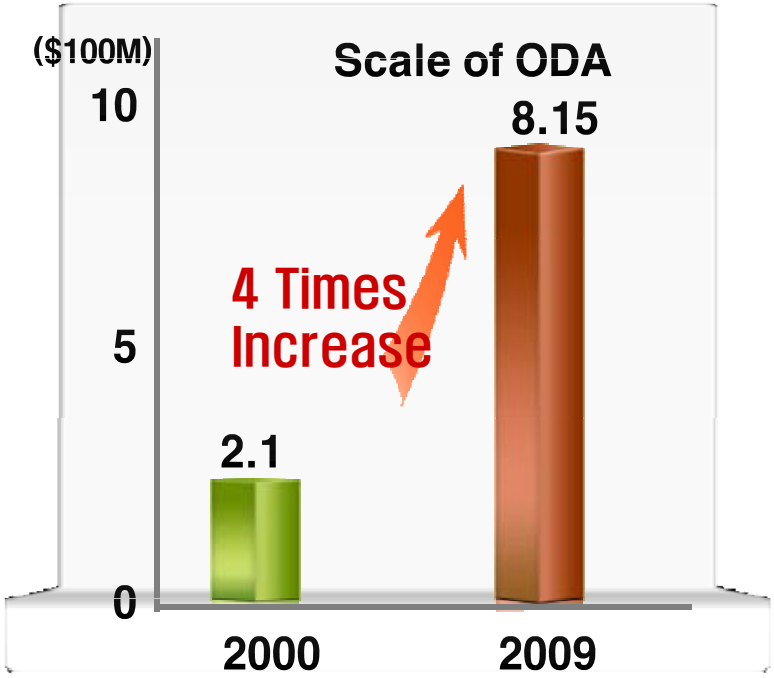
❖ Deliver aid sincerely with two hands

Source: www.odakorea.go.kr

I. Korea's ODA Policy

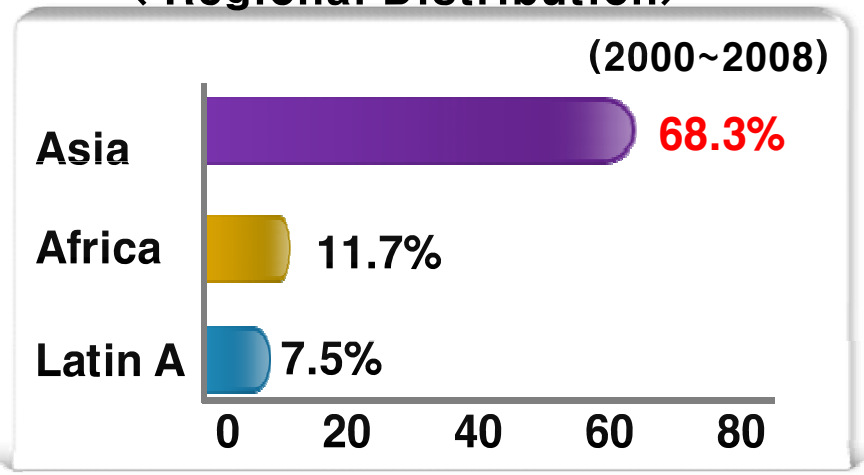
Korea's ODA at a Glance

Scale : $210mil('00) ⇒ $815mil ('09)
4 times increase

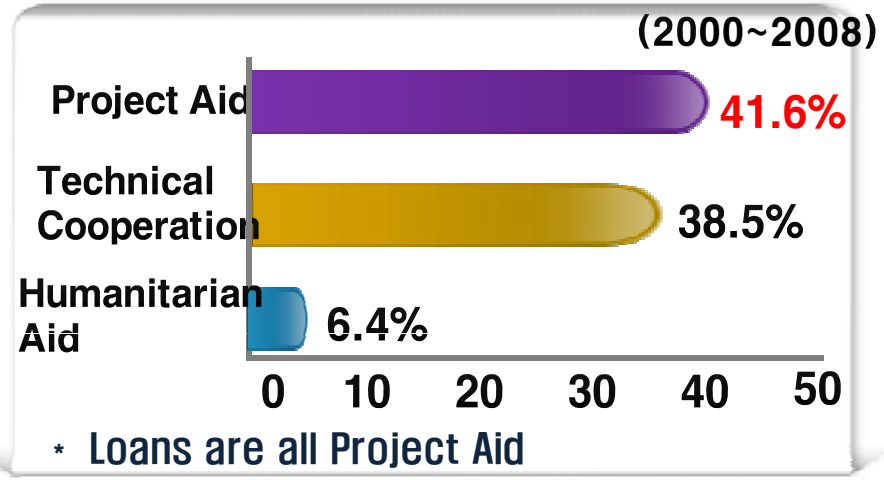


Source: PM's Office('11.3.24)

〈 Regional Distribution〉



〈 Modality(Grants) 〉



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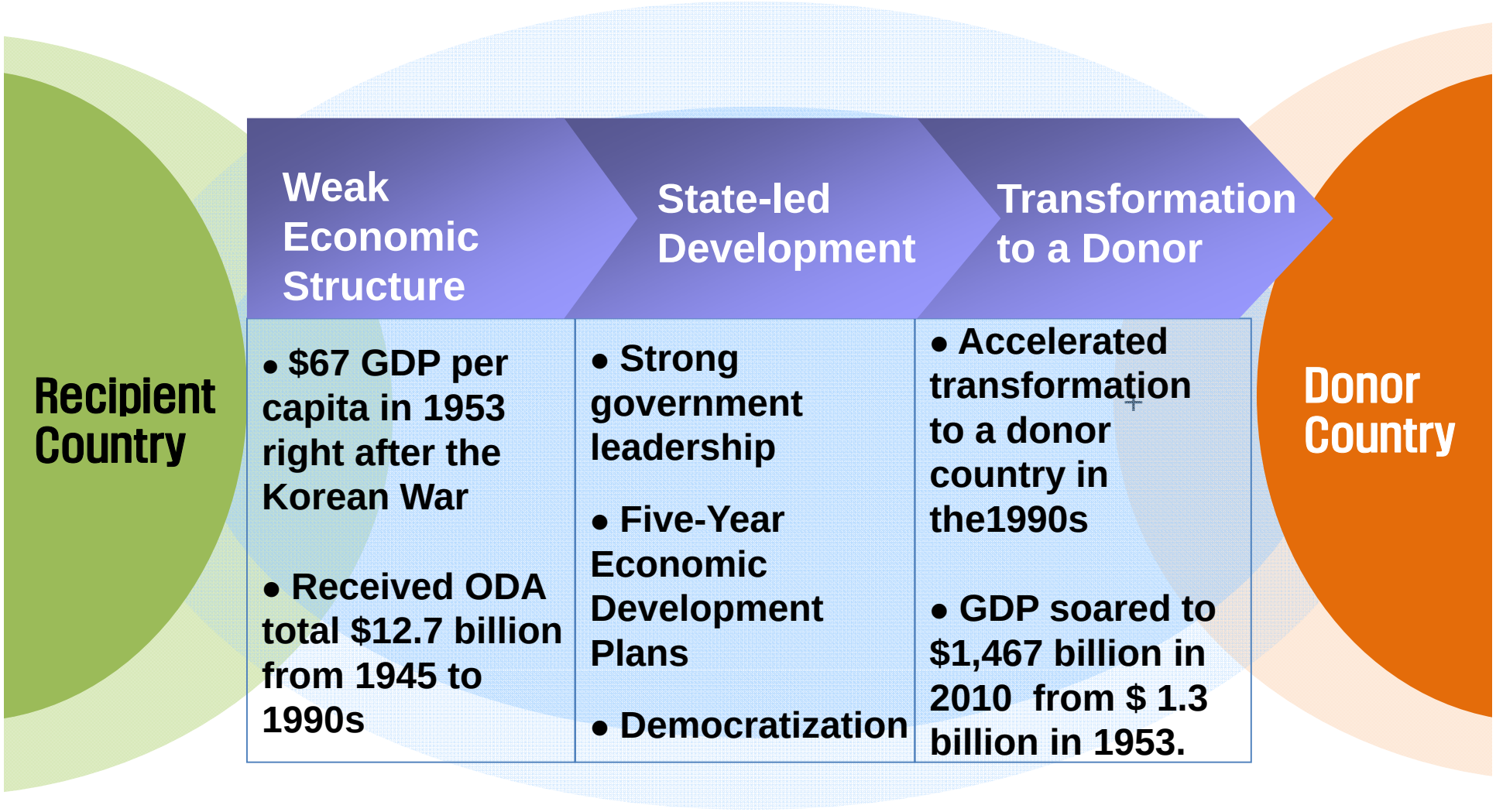
II. KOREA'S DEVELOPMENT EXPERIENCE

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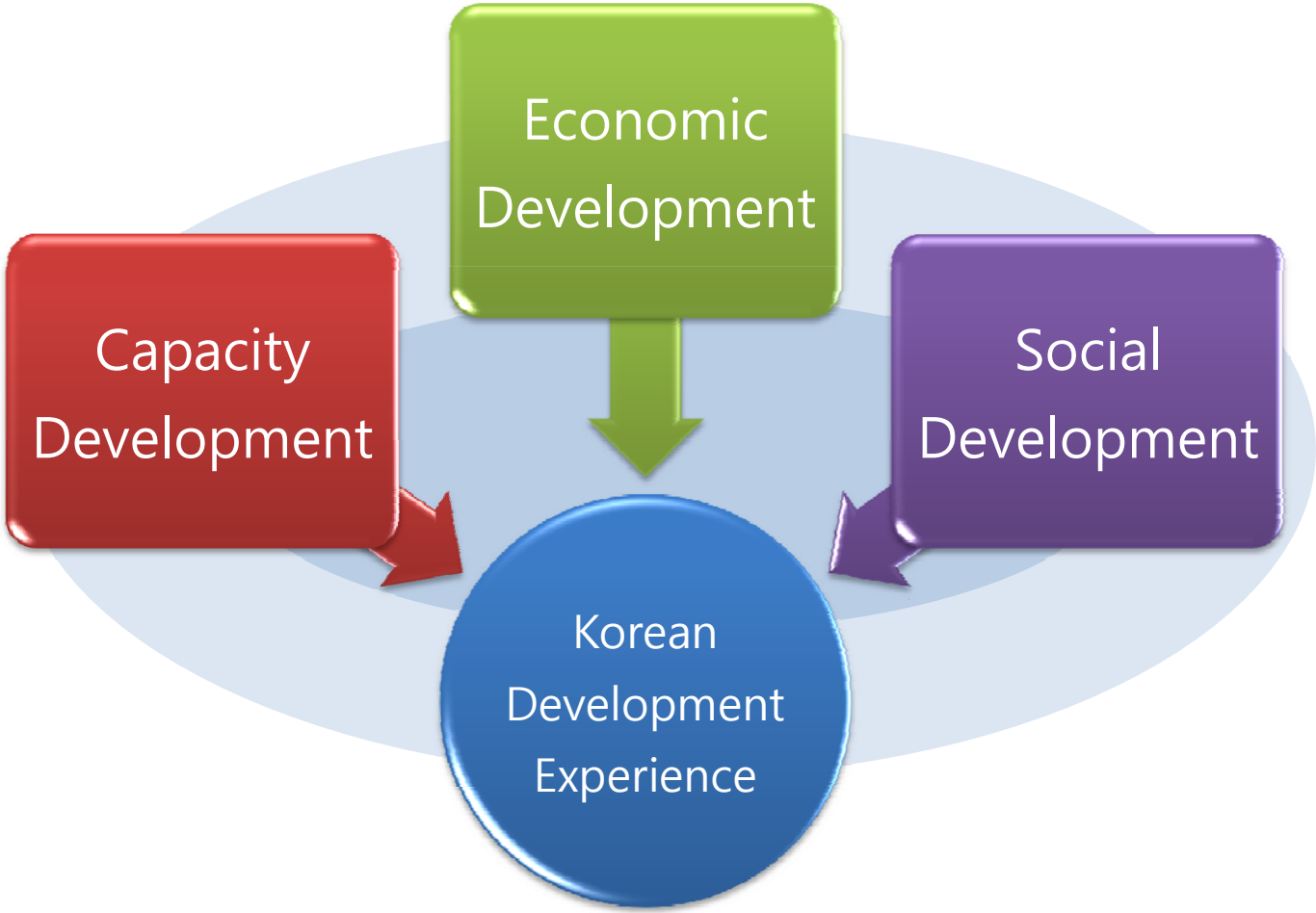
II. Korea's Development Experience

Korea's Experience



II. Korea's Development Experience

Korean ODA





III. CAPACITY DEVELOPMENT



III. Capacity Development

Key Element for Korean Development

Capacity Building

- Abundant human resource
- High enrollment rate in primary education
- Skilled labor force for economic growth

State-led Development

- Five-Year Economic Development Plans
- Foreign assistance aligned with national development priority
- Endeavored to prevent corruption

III. Capacity Development

❖ Supporting Capacity Development and Institution Building for self-reliance



III. Capacity Development

Public Capacity Development Program

- From 1991 to 2010, KOICA provided education service for 1,876 trainees in the area of Fisheries and Aquaculture
- Scholarship Program
  - Master's degree programs of Fisheries Science at Pukyung Univ. offered to 60 government officials from 43 countries (2010~2012)



III. Capacity Development

Laos Stock Exchange System

- KOICA established ‘Laos Stock Exchange System’ training program from 2007 to 2010.
- Korea Securities Depository trained Laos public officers from Bank of Lao PDR, Ministry of Finance, and Stock Market Establishment Committee.
- Laos government is now planning to establish ‘The Laos Stock Exchange’.



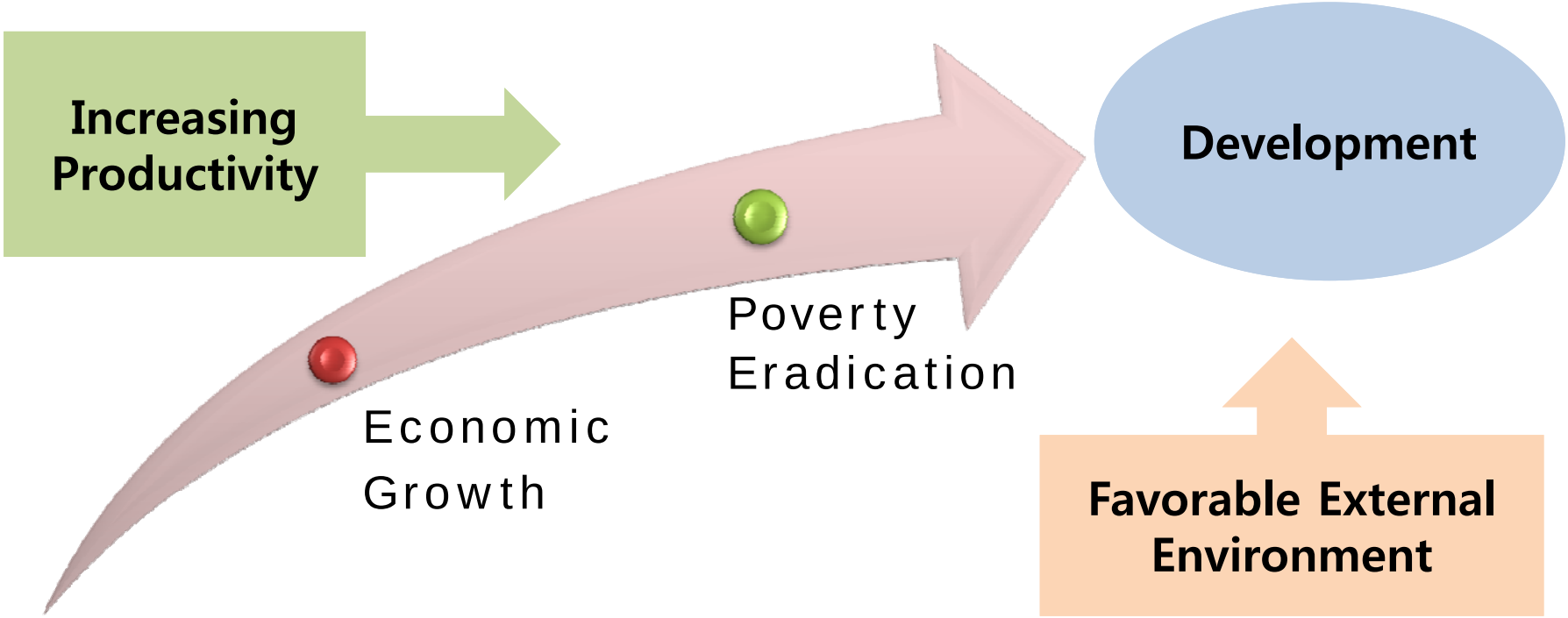


IV. ECONOMIC DEVELOPMENT



IV. Economic Development

- Sound and sustainable economic growth is important to poverty eradication and development.
- Increasing productivity and making the most of external environment for effective development



IV. Economic Development

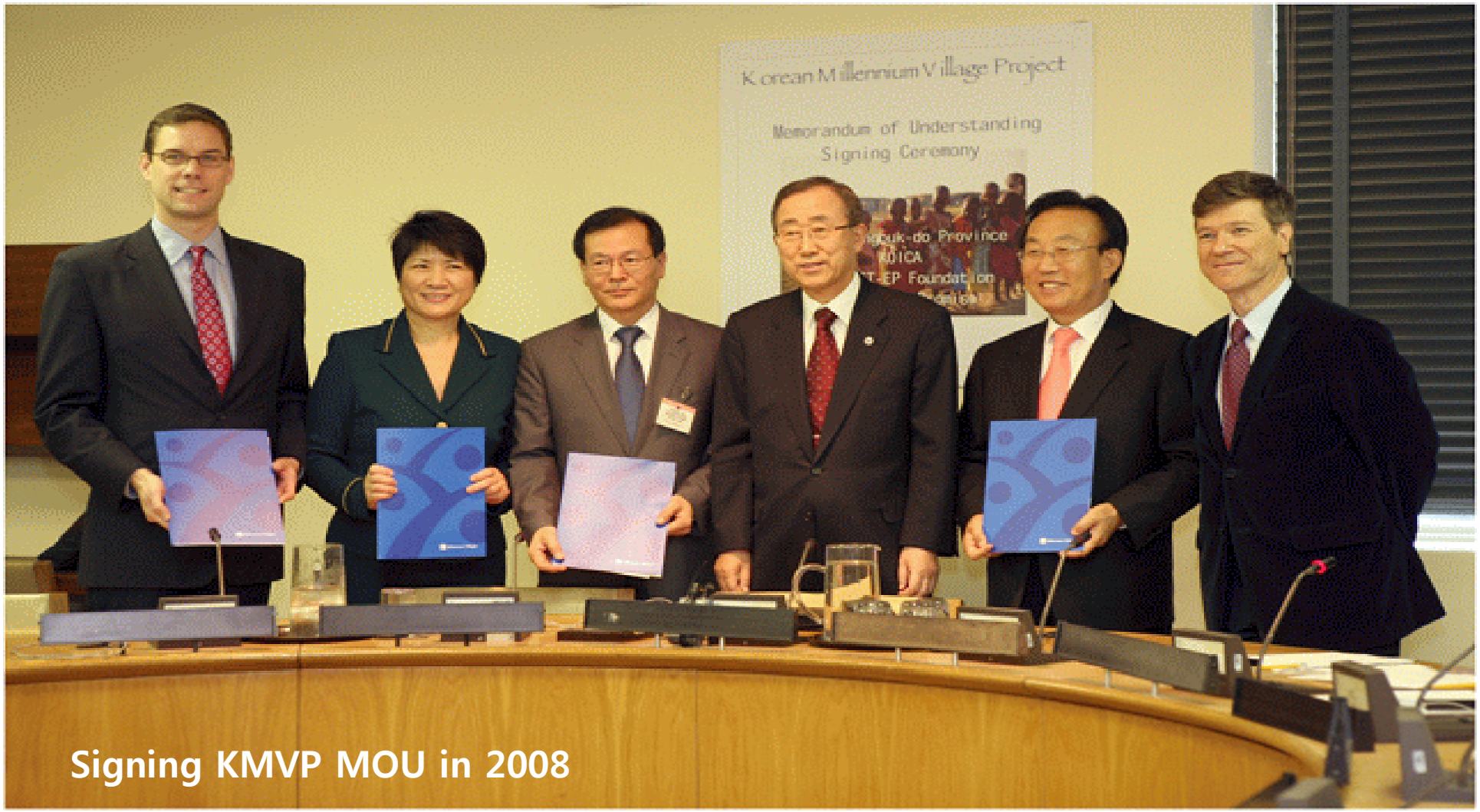
Agricultural Productivity → ICT and Service

Rural Development

Vietnam Saemaeul-Undong Pilot project	Korea Millennium Village Project in Tanzania and Uganda
• 2 village and $300,000 project spread 650 villages by Vietnam government since 2006. • In 2010, every rural development project was combined as 'Lang Moi Movement (New Village Movement)'	• To achieve MDGs in Sub-Saharan Africa and share Korean development experience • Cost: USD 8 million • Promoting sustainable development and community mobilization

IV. Economic Development

Korea Millennium Village Project



Signing KMVP MOU in 2008

IV. Economic Development

ICT Project

- ICT project can achieve development in many sectors (i.e. poverty reduction, education, health and etc.)
- Capacity building in ICT is critical to build ICT infrastructure and reduce information gap.
- High labor demand in ICT industry about 16.9 million in Asia-pacific region in 2010
- The Project for the Establishment of Bangladesh-Korea ICT Training Center for Education
  - Objective: To strengthen educational capacity in ICT
  - Output: Produced computer teachers and strengthened work capacity of Ministry of Education

IV. Economic Development

KOICA

ICT Project: Bangladesh





IV. Economic Development

Aid for Trade

- Making the best use of favorable external environment and export-oriented policies
  - Korea adopted export-oriented industrialization and export promotion policies to achieve economic development.



IV. Economic Development

Aid for Trade: Cambodia

Title	Objective
The Project for Capacity Building in the Trade in Goods and Services for Cambodia	1) To enhance the implementation of Cambodia's WTO commitments 2) To expedite its economic integration into the free trade and investment areas of ASEAN.
Implementation	**Output**
• Joint Research • Invitational Training • Provision of Equipment	• Strengthened institutional capacity for trade • Built infrastructure for goods and services

IV. Economic Development

Aid for Trade: Evaluation Workshop





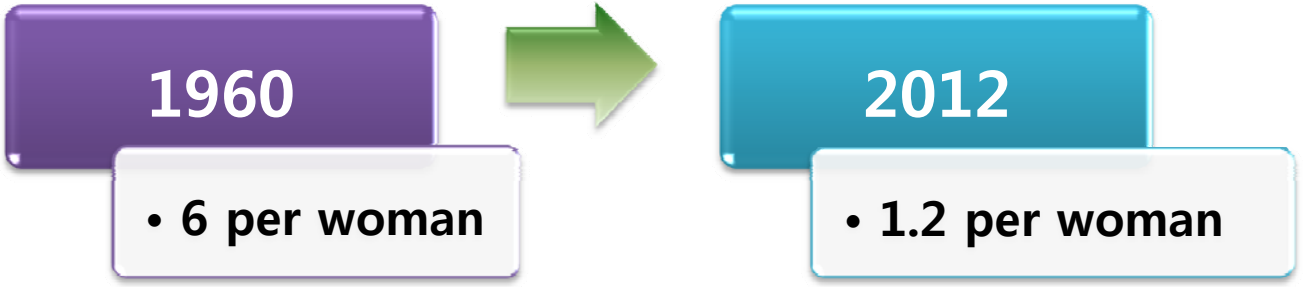
V. SOCIAL DEVELOPMENT



V. Social Development

Linkage with economic development

- Lacking social infrastructure during rapid economic development was covered by foreign assistance.
- Korea adopted ‘family planning project’ as national policy to reduce birthrate in 1965;



- Also, provided primary health care for fair health service to the public.
- KOICA implements primary health care, maternal childhood health and family planning projects.





V. Social Development

KOICA Health Project in Peru

- Dispatching human resources(doctor and volunteer) to increase access of women and children
- Expanding health infrastructure focusing on primary health care
- 1992 – 2009, 6 health projects became effective with capacity building from infrastructure and supporting human resource.



V. Social Development

Vocational Training Program

- KOICA implements vocational training program to assist partner country's industrialization.
  - Considering lack of social infrastructure and industrial foundation, vocational training is the key policy.
  - Vocational training program, infrastructure expansion and linking school and labor market

Project for the Korea-Afghanistan Vocational Training Center in Bagram, Afghanistan
(2008-2012, USD 14.5 million)

- Objective
  - ✓ Job creation, employment, income growth in Afghanistan by training skilled labor

V. Social Development

Korea-Afghanistan Vocational Training Center







V. Social Development

Education

- Korea's successful primary-secondary education development experience
  - Developed printing facility and publication capacity through foreign assistance
- Laos Textbook Supply project (2007-2009, USD 3 million)
  - Objective
    - To contribute to quality of education by supplying textbook supply and curriculum development
  - Output
    - Strengthened textbook supply capacity by training, printing technology transfer and education
    - Primary-Secondary Education quality improvement with curriculum development capacity through training and consultation

V. Social Development

Laos Textbook Supply Project





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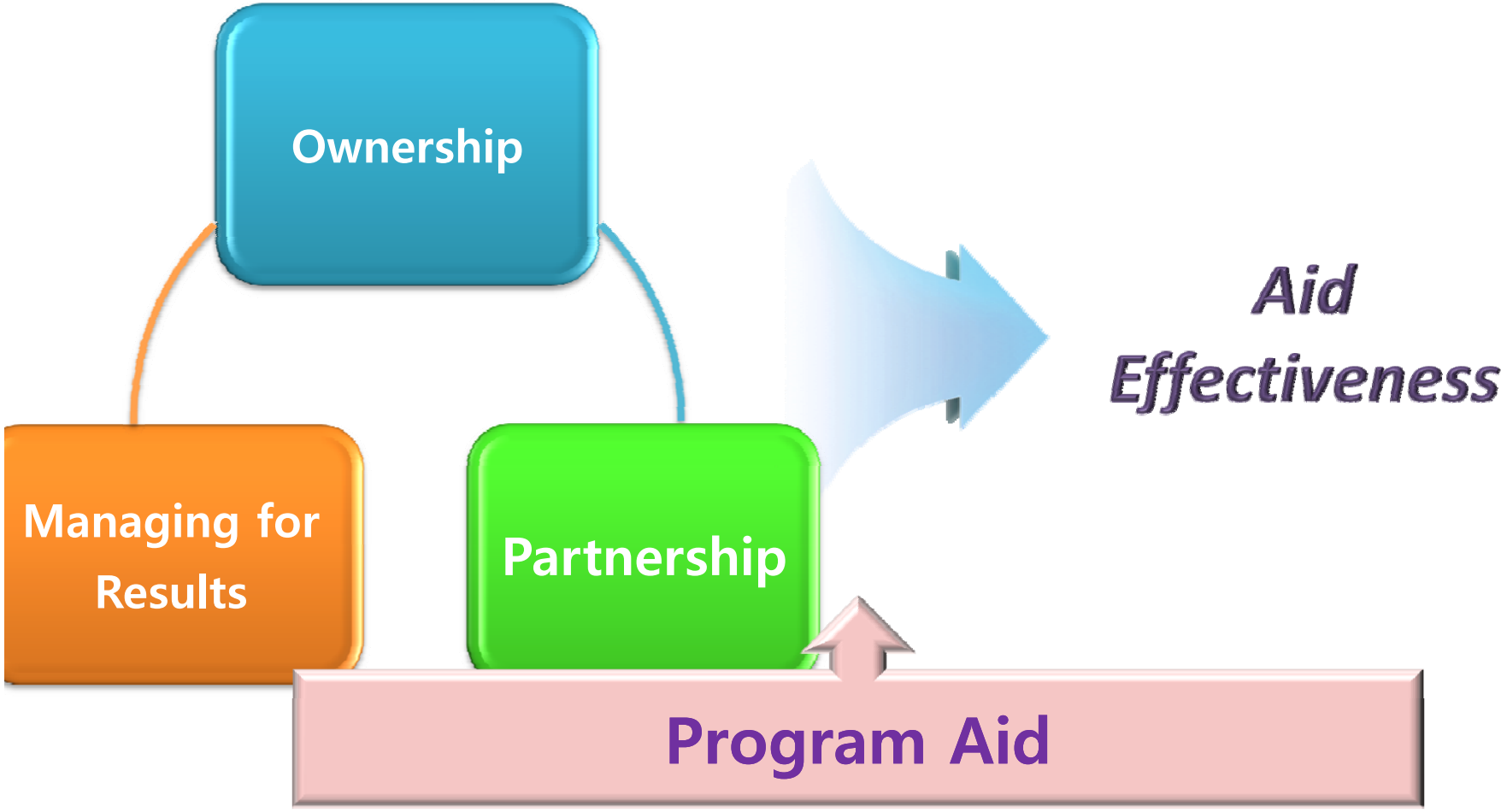
VI. KOICA'S PLAN FOR AID EFFECTIVNESS

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VI. KOICA's Plan for Aid effectiveness

KOICA's Strategy



VI. KOICA's Plan for Aid effectiveness

Program Aid

- **KOICA provides a country-tailored program to support implementing a partner country's own sector development plan(Health, Education, Rural Development etc.)**

- **KOICA utilized various modalities such as projects, technical assistance and budget support in a package for Program Aid**

VI. KOICA's Plan for Aid effectiveness

Ex) Vocational Training Program

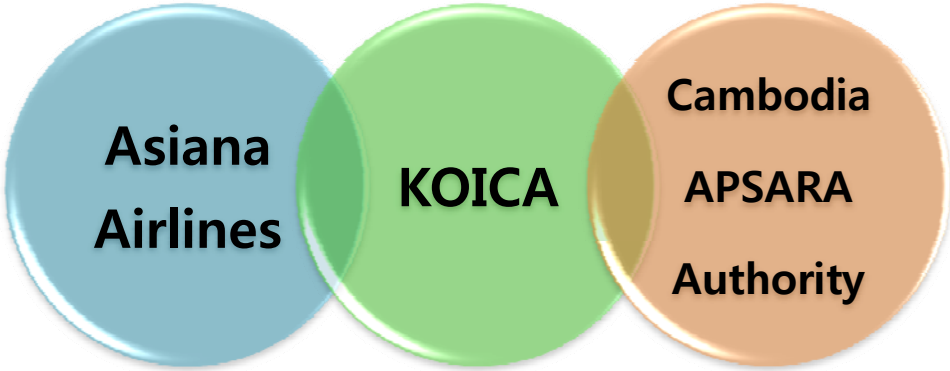
Partner Development Program	Program Aid Design
• TVET mid-term Strategy • Human Resource Training	• Vocational Training Facility Expansion • Building Female/Vulnerable people Vocational Capacity Development Center • Institutionalizing National Technology Verification Test • Linking Industrial Cluster with Human Resource

VI. KOICA's Plan for Aid effectiveness

Private-Public Partnership (PPP)

- KOICA supports Korean private company's social responsibility in line with KOICA's development objective.
  - Partnership with private sector is important as private investment and activities could contribute to development of partner countries.

The Project for the Solar Streetlight in Ankor heritage



VI. KOICA's Plan for Aid effectiveness

The Solar Streetlight in Ankor Heritage

- While KOICA constructed a detour in Siem Reap to preserve Ankor Wat, Asiana Airlines implemented project to install the solar street light in Ankor heritage.

- Expected to reduce car accidents and crime, to contribute to local economy and to minimize environment pollution



VI. KOICA's Plan for Aid effectiveness

South-South Cooperation

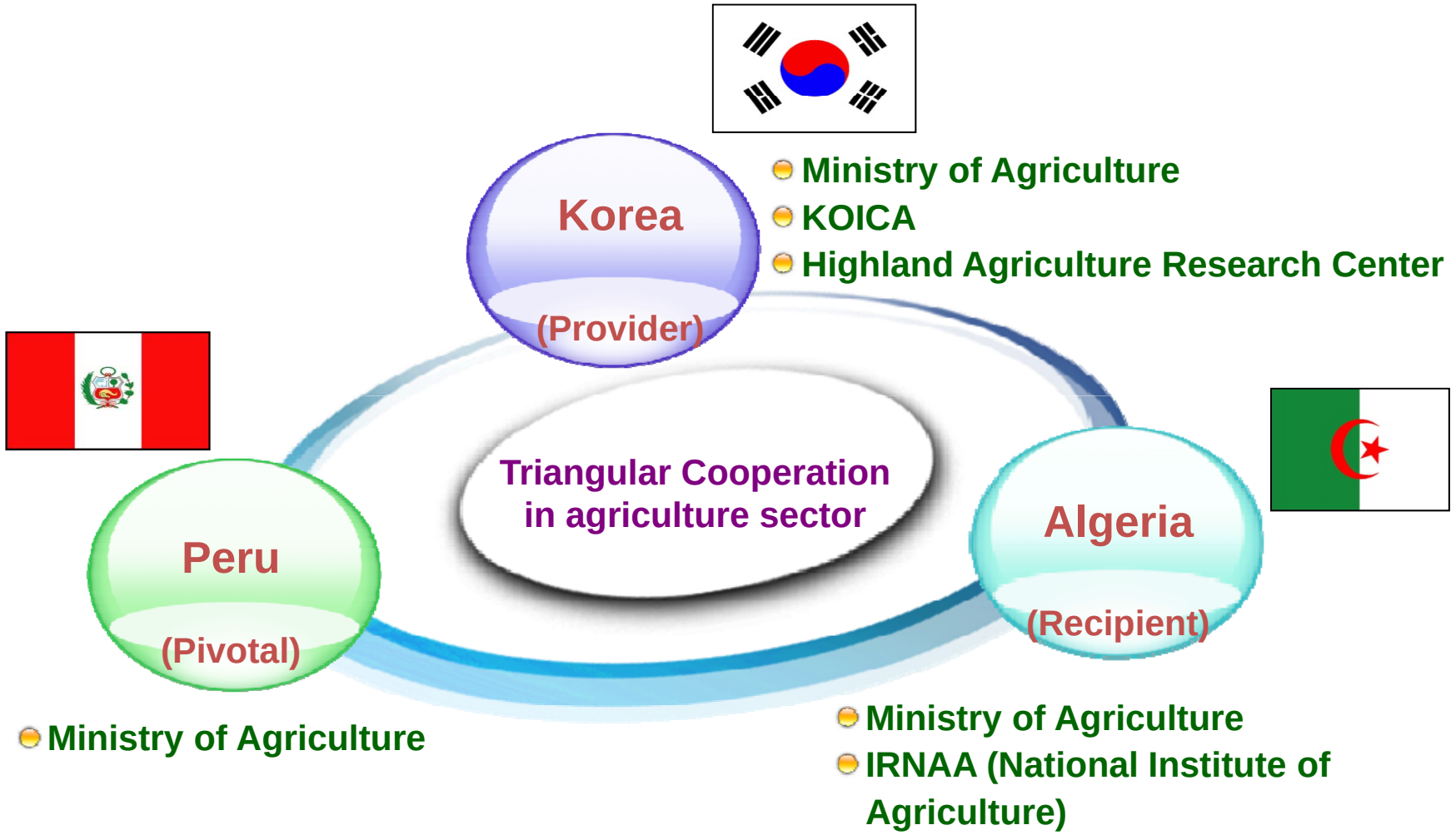
- KOICA will support south-south cooperation to share economic, human, technological resources for economic and social development and self-reliance in partner country.
- Based on similarity between countries, south-south cooperation enabled sustainable support for infrastructure and development resource.

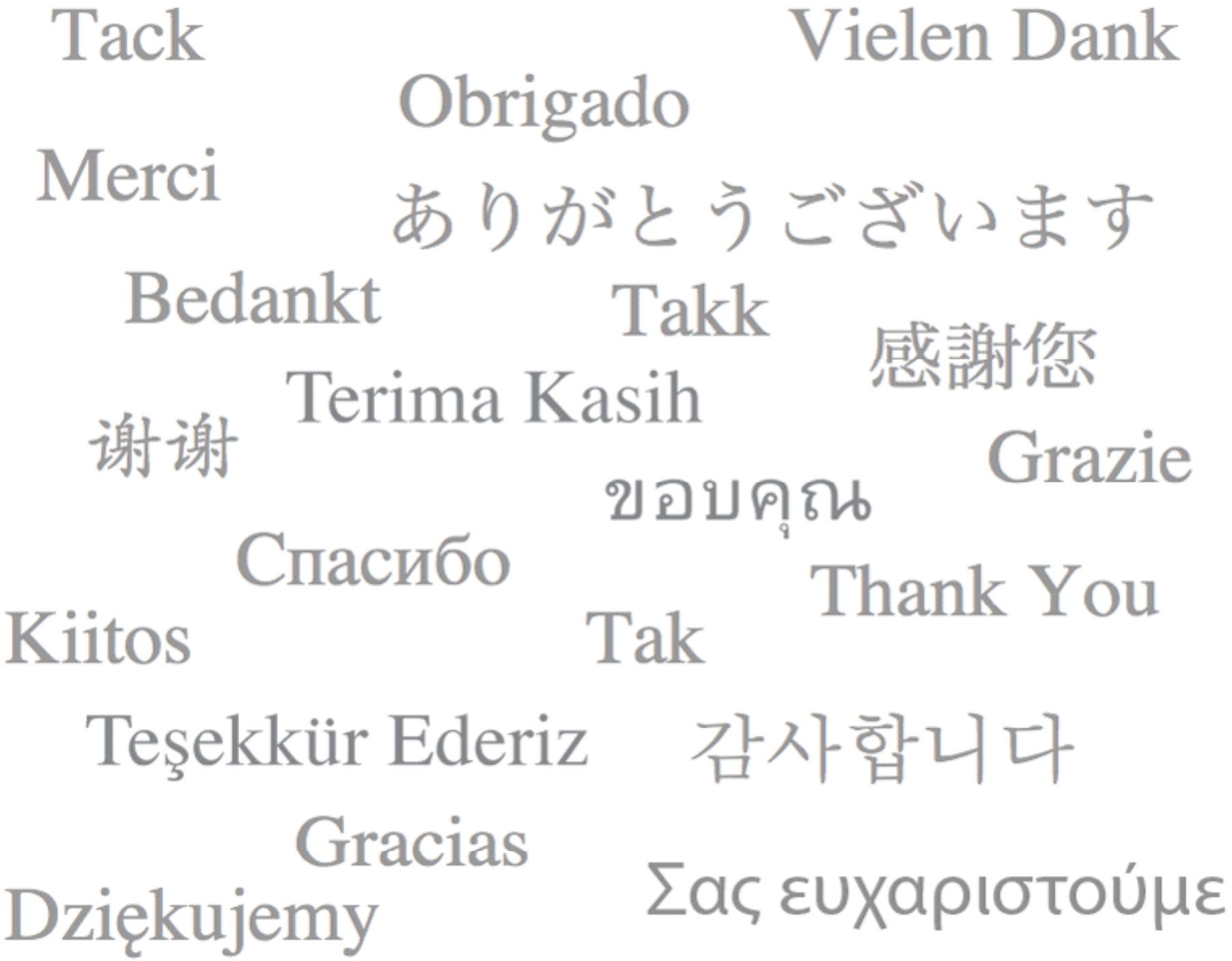
KOICA Triangular Cooperation Project for Techniques of Seed Potato Production in Algeria



VI. KOICA's Plan for Aid effectiveness

Triangular Cooperation of Seed Potato in Algeria

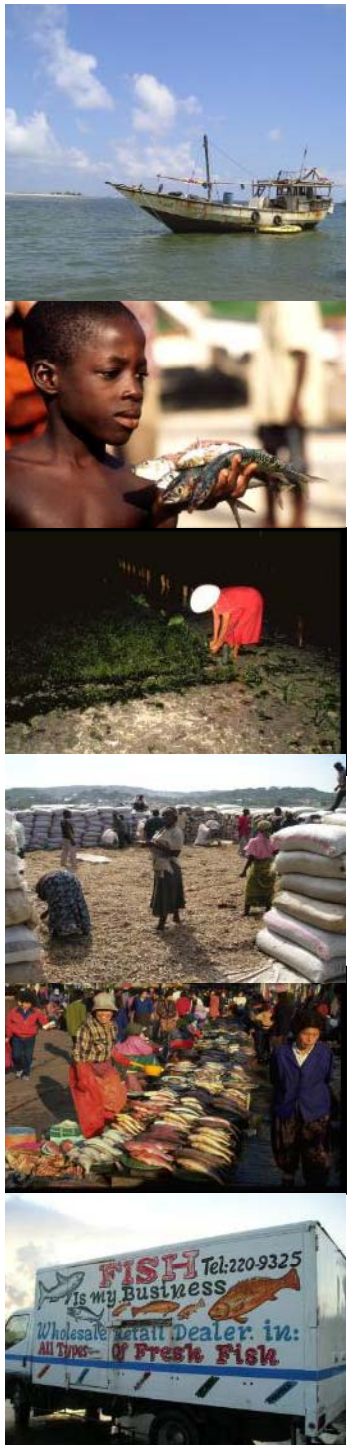



Tack
Vielen Dank
Obrigado
Merci
ありがとうございます
Bedankt
Takk
感謝您
Terima Kasih
谢谢
Grazie
ขอบคุณ
Спасибо
Thank You
Kiitos
Tak
Teşekkür Ederiz
감사합니다
Gracias
Σας ευχαριστούμε
Dziękujemy



Alleviating Hunger & Poverty?

Fish *can* make a difference

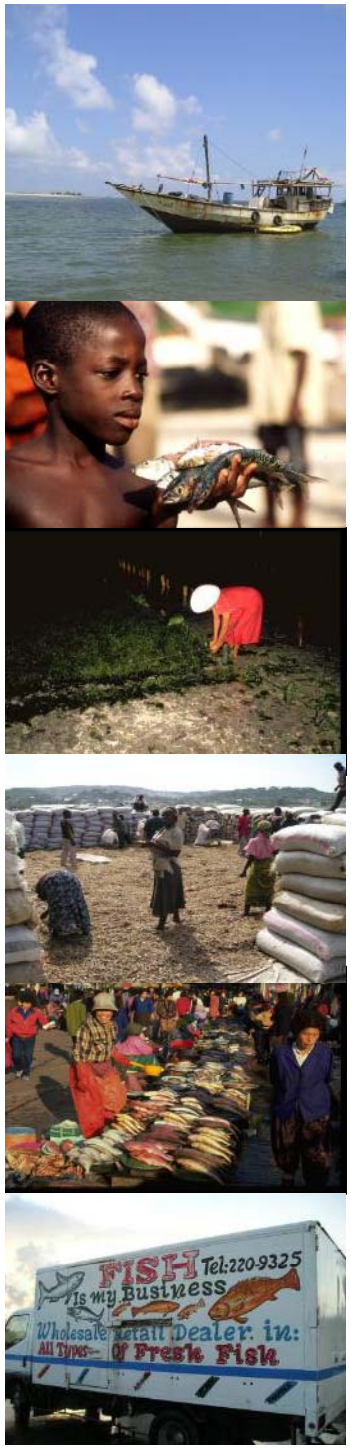


Current Situation

- **Development**
  - **1 billion chronically hungry**
  - **1 billion nutritionally deficient**
  - **Brain disorders: the #2 health burden in 8 years**
- **Poverty alleviation**
  - **50 billion USD/year lost rent**

We cannot realize sustainable development unless hunger and malnutrition are eradicated.

FAO 2012



Global Leaders

- Ensure the sustainability of human beings by addressing food issues
- Recognize roles of fish
- Allow for Innovative technologies
  - New aquaculture systems can help address space, water challenges
  - New technologies can increase efficiencies
- Recognize the roles of women
  - Empowering women facilitates socioeconomic equity
  - Maternal and child health
- Mainstream fisheries into national planning







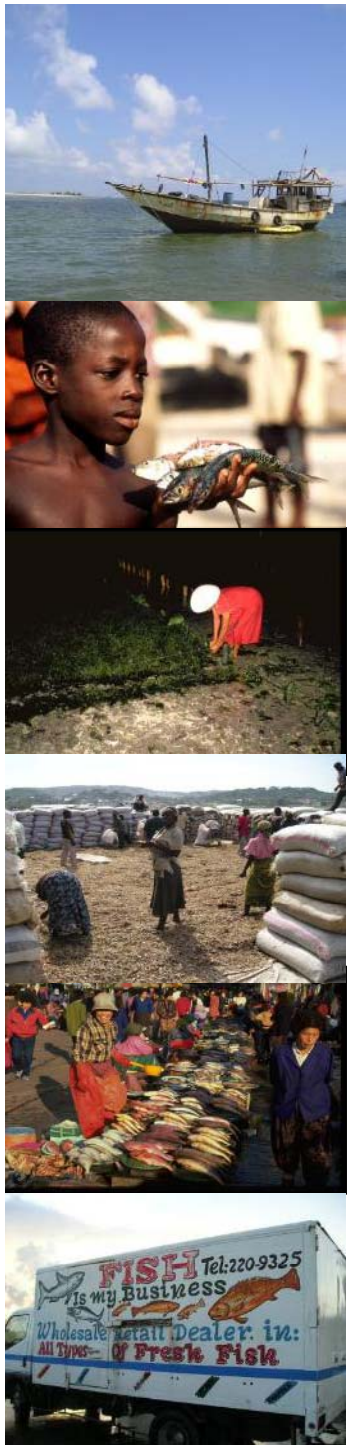




Development, Food & Nutrition Security

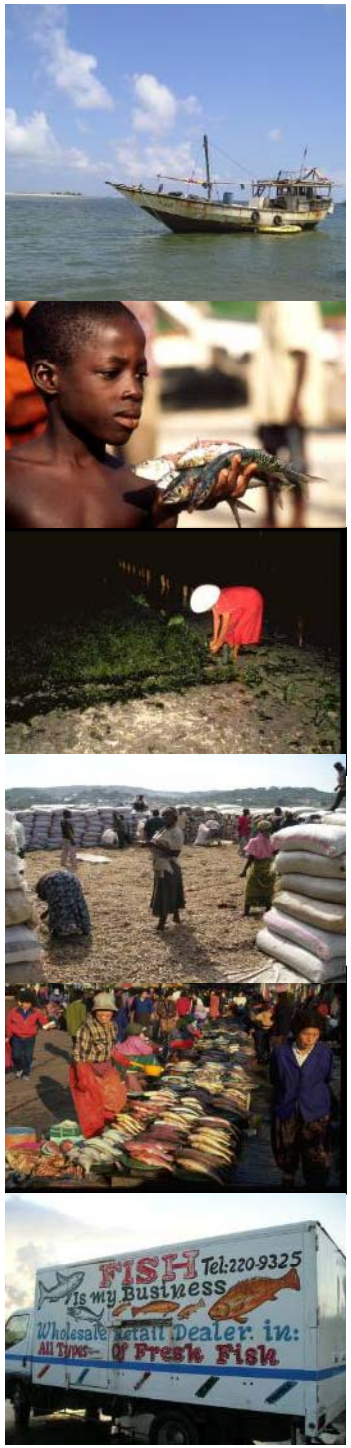
Development & poverty alleviation

- Employment & livelihoods
- Market access & trade are essential
- International governance for food security should be stronger
- Success stories can encourage investment in the fisheries and aquaculture sectors.
- Tangible capacity development experiences are essential for developing countries



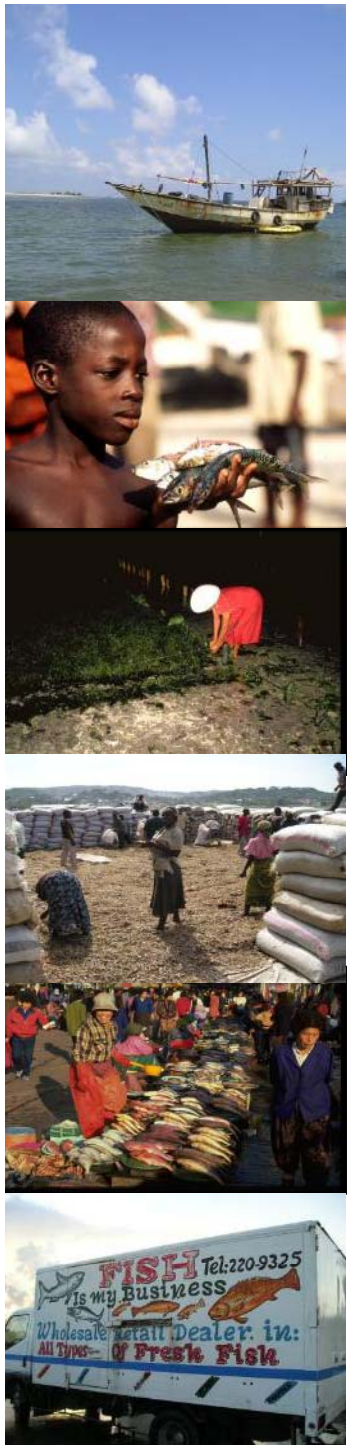
Awareness Raising Strategies

- ISU
  - Understanding barriers and mechanisms for transitioning to better, improved fisheries
  - understanding the true value of fish
- NAFCO & the private sector
  - Nexus between policy, finance, business, innovation, development, markets & pricing
  - Drivers and, especially, capital constraints to growth and the existence of concessions/tenure systems
  - Strategic public private partnerships/JVs



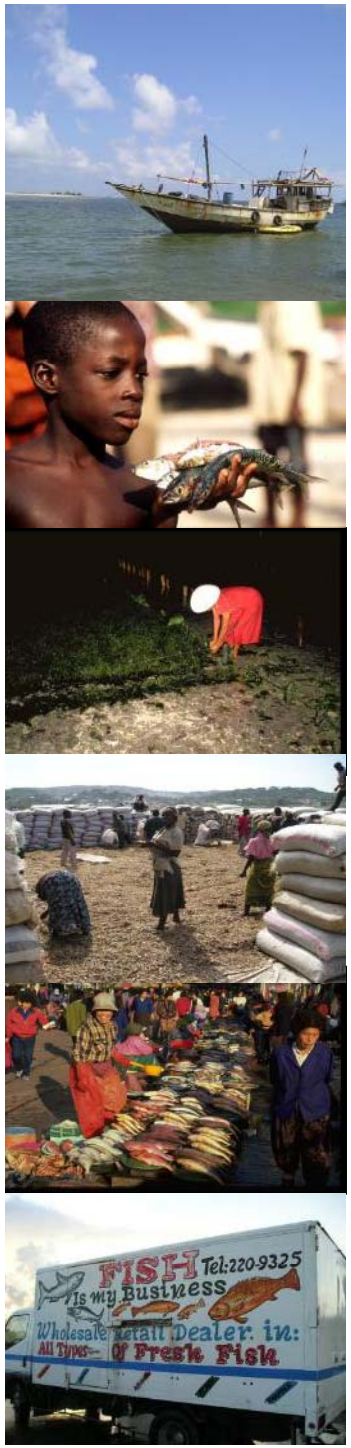
Awareness Strategies & Tactics

- Latin America - 4 actions
- Create global consensus, strategic executable action plans on how to move forward
- Communicate success stories, create equality in trade and communications
  - Especially for ecolabeling schemes
- Be innovative about the sector
  - Set priority species for competitive aquaculture
  - Use innovative farming technologies & systems
  - Consider alternatives - bioenergy, aquarium fish, tidal flats



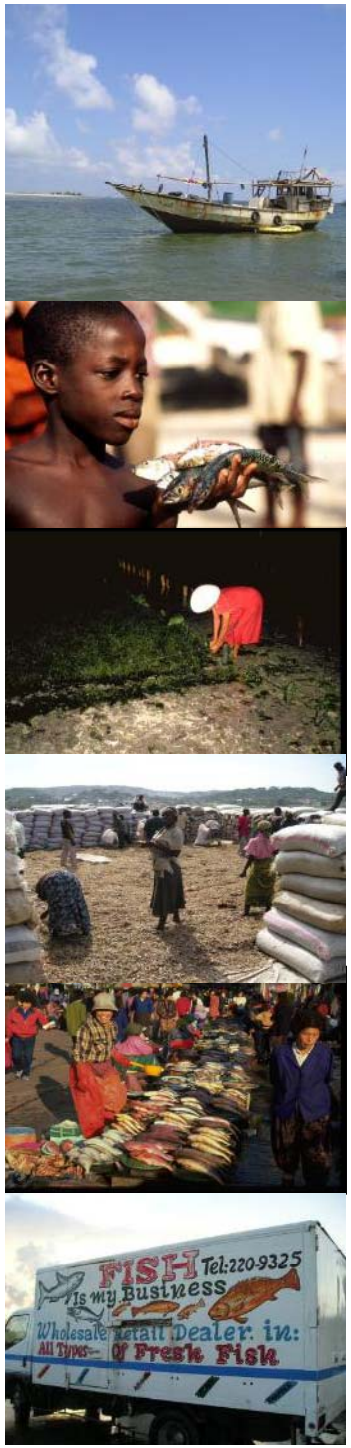
Ocean & the Humanities

- **Connectivity and the oceans as a bridge**
  - **Between continents & countries**
  - **Between cultures**
  - **Creating kinship**
- **Caring for our oceans**
  - **To support humanity**
  - **To sustain humanity in the fullest sense of the word “sustain”**



Looking Forward

- **Overseas development assistance**
  - **Targeted – to reduce & alleviate poverty**
  - **Holistic & integrated**
    - **human rights**
    - **Realization of gender equality**
    - **Links sustainable development & humanitarianism**
    - **Promotes economic cooperation**
    - **Aims to increase the peace and prosperity of the international community**



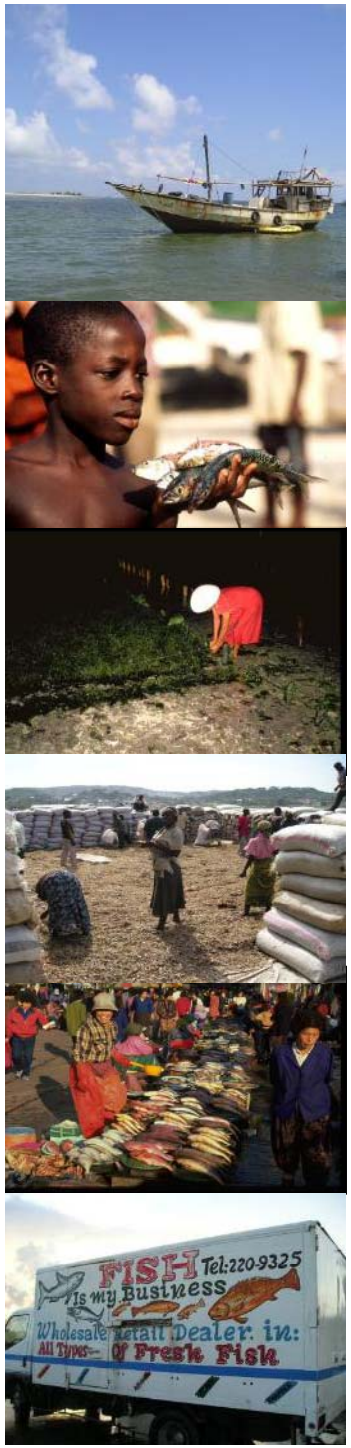
Looking Forward

- **Working to achieve the Millennium Development Goals**
  - **Poverty & hunger (Goal 1)**
  - **Gender equality & empowerment of women (Goal 3)**
  - **Reducing child mortality (Goal 4)**
  - **Improve maternal health (Goal 5)**
  - **Ensure environmental sustainability (Goal 7)**



Realize Sustainable Development?
Alleviate Hunger & Malnutrition?
Achieve the MDGs?

Fish *can* make a difference!



We cannot realize sustainable development unless hunger and malnutrition are eradicated.

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