

## Challenges for aquaculture development in Eastern Africa

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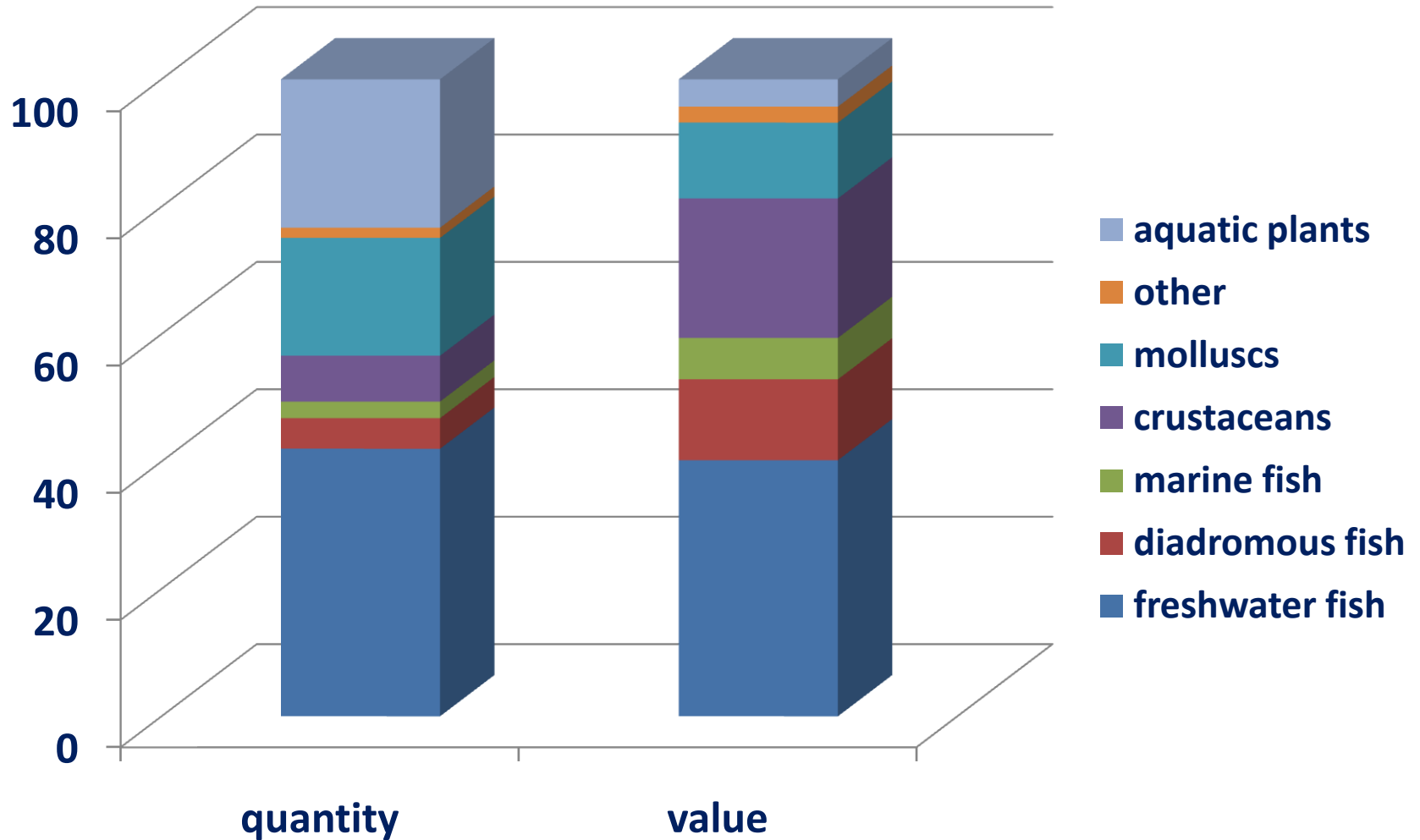




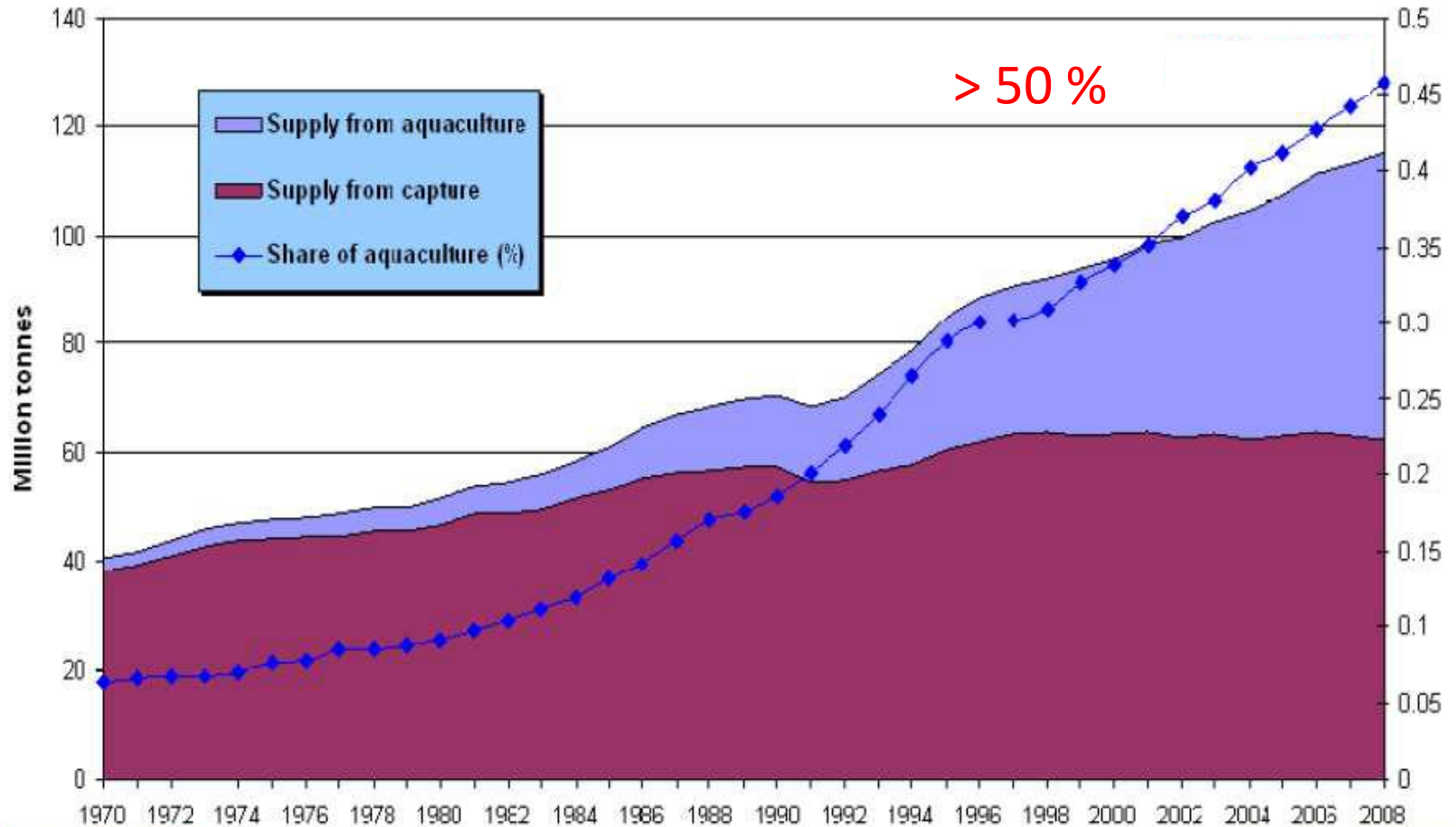
## aquaculture products



# World aquaculture production by species category (%) in 2009



# Contribution of aquaculture to total production of aquatic food



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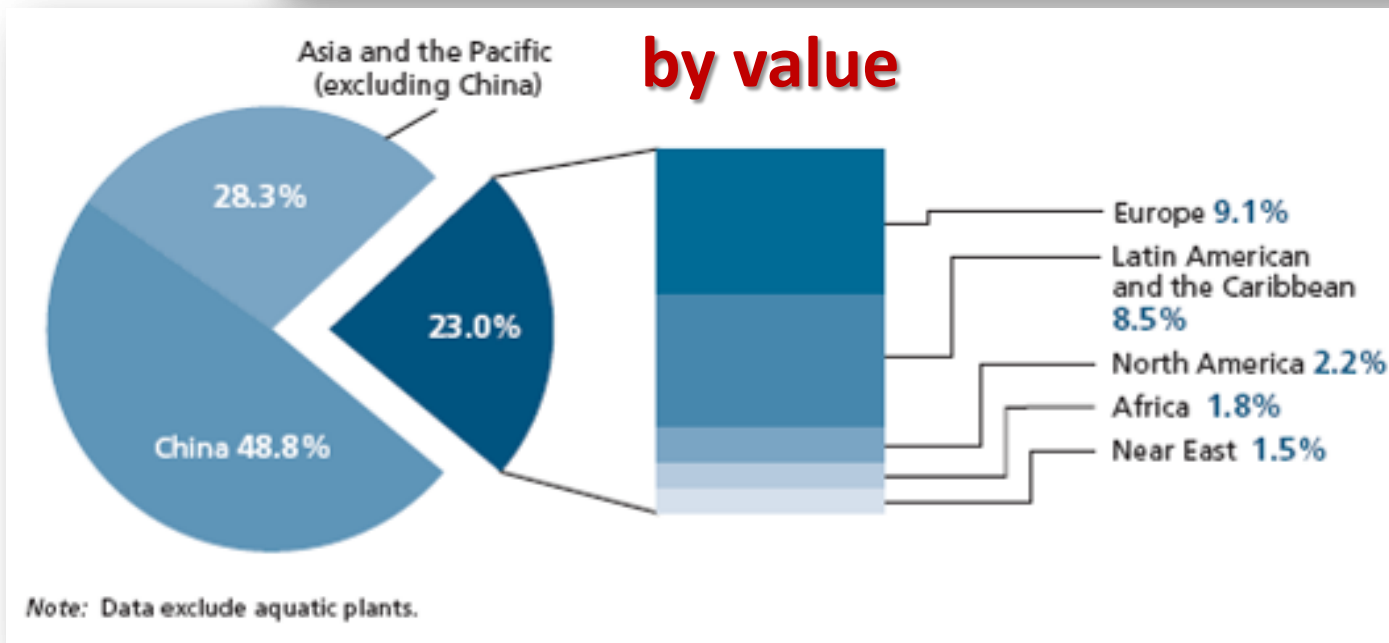
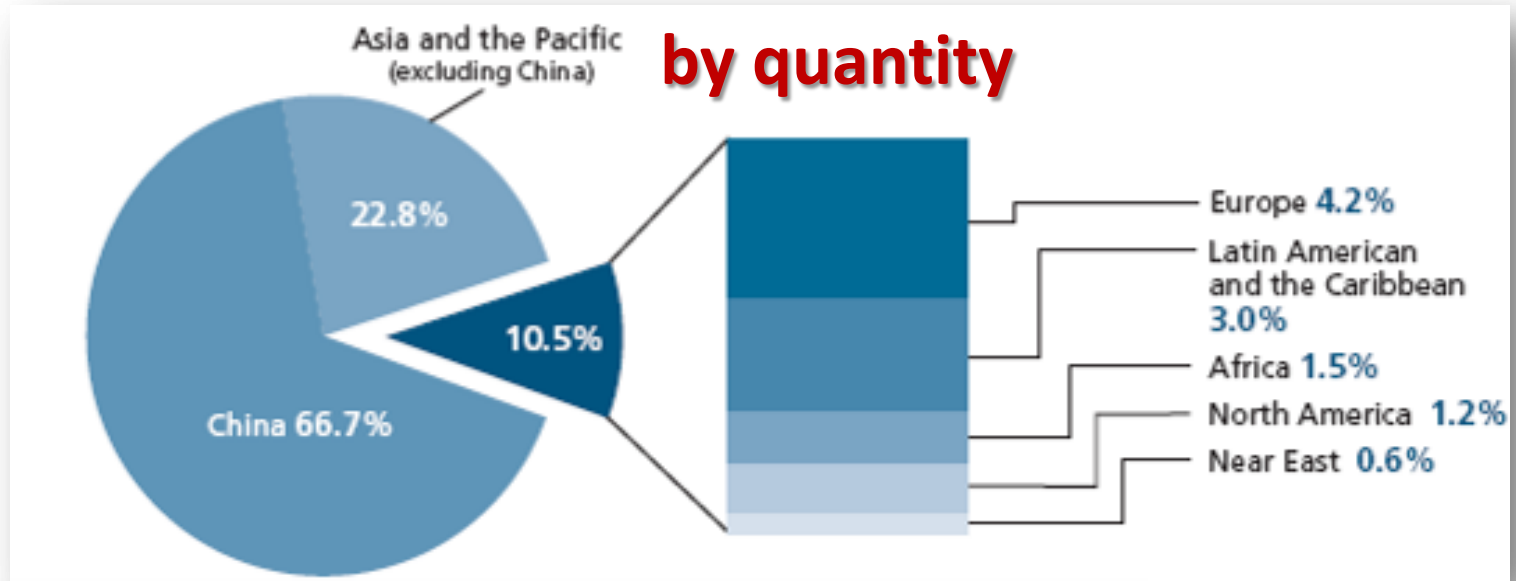
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# Aquaculture production per region (2009)

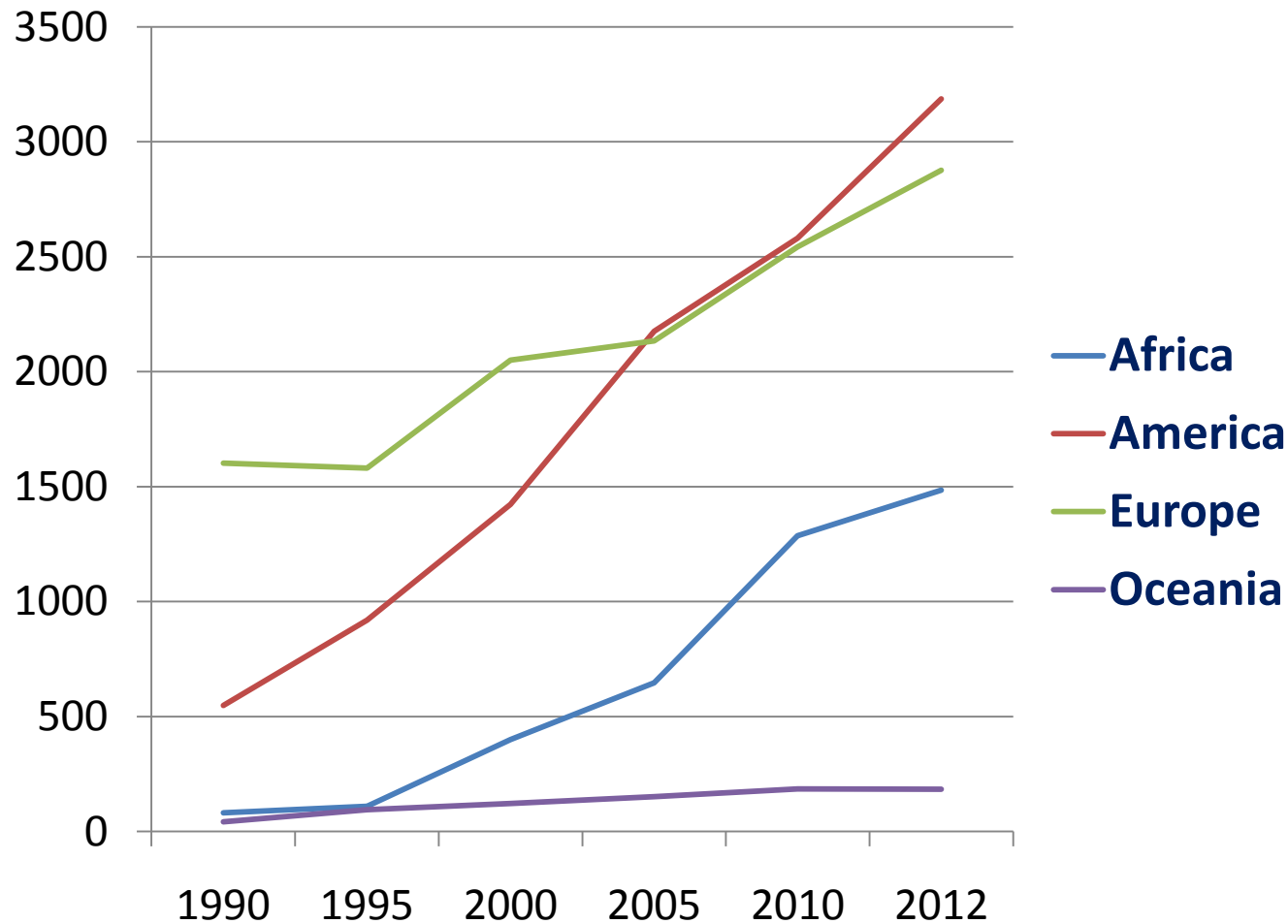


# World production (tons) of food fish\* from inland aquaculture & mariculture by continent

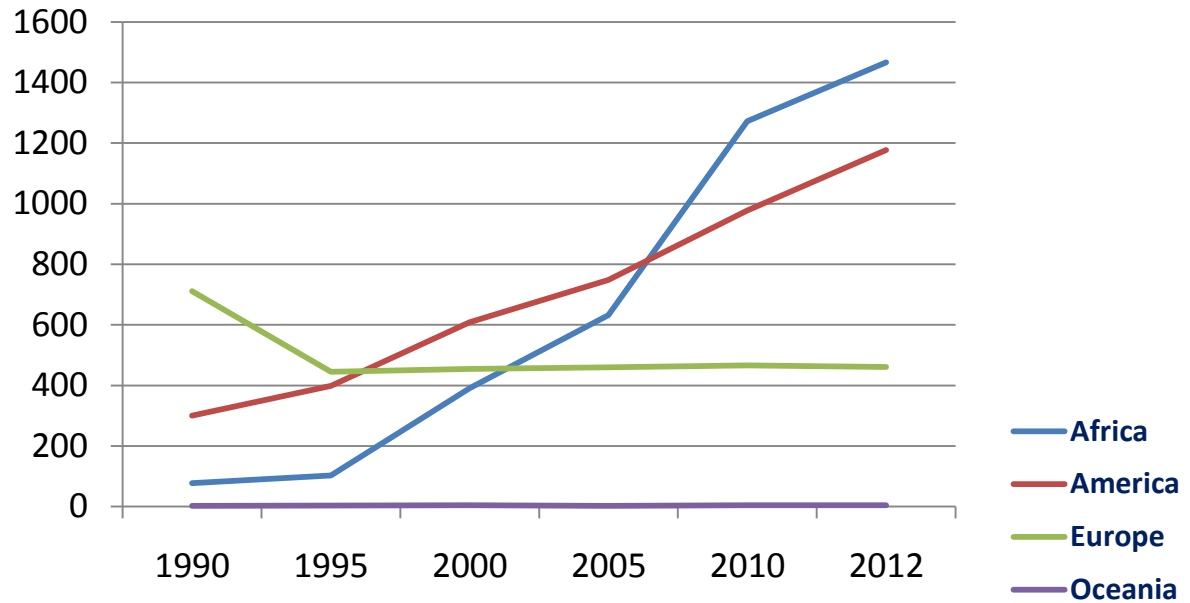
\*finfish, crustaceans, molluscs, echinodermates, vertebrates

		1990	1995	2000	2005	2010	2012
<b>Africa</b>	Inland	77 279	102 703	391 581	632 001	1 273 503	1467 749
	Mariculture	3 736	7 589	8 107	14 181	13 088	17 618
	<b><i>Africa total</i></b>	81 015	110 292	399 688	646 182	1 286 591	1 485 367
<b>America</b>	Inland	300 536	398 112	609 909	748 545	977 923	1 177 439
	Mariculture	247 943	521 459	813 524	1 428 195	1 603 166	2 009 881
	<b><i>America total</i></b>	548 479	919 571	1 423 433	2 176 740	2 581 089	3 187 319
<b>Asia</b>	Inland	6 574 192	12 650 165	17 321 975	24 278 467	34 065 242	38 835 173
	Mariculture	4 227 464	9 027 349	11 100 514	14 909 386	18 374 898	20 064 895
	<b><i>Asia total</i></b>	10 801 656	21 677 514	28 422 489	39 187 853	52 440 140	58 900 068
<b>Europe</b>	Inland	711 245	445 512	454 849	460 048	466 615	461 095
	Mariculture	890 279	1 135 395	1 595 840	1 674 856	2 077 363	2 415 213
	<b><i>Europe total</i></b>	1 601 524	1 580 907	2 050 689	2 134 904	2 543 978	2 876 309
<b>Oceania</b>	Inland	1 781	2 692	3 808	1 800	3 660	4 309
	Mariculture	40 224	91 546	117 674	149 666	181 957	179 882
	<b><i>Oceania total</i></b>	42 005	94 238	121 482	151 466	185 617	184 191
<b>WORLD</b>		<b>13 074 679</b>	<b>24 382 522</b>	<b>32 417 781</b>	<b>44 297 145</b>	<b>59 037 416</b>	<b>66 633 253</b>

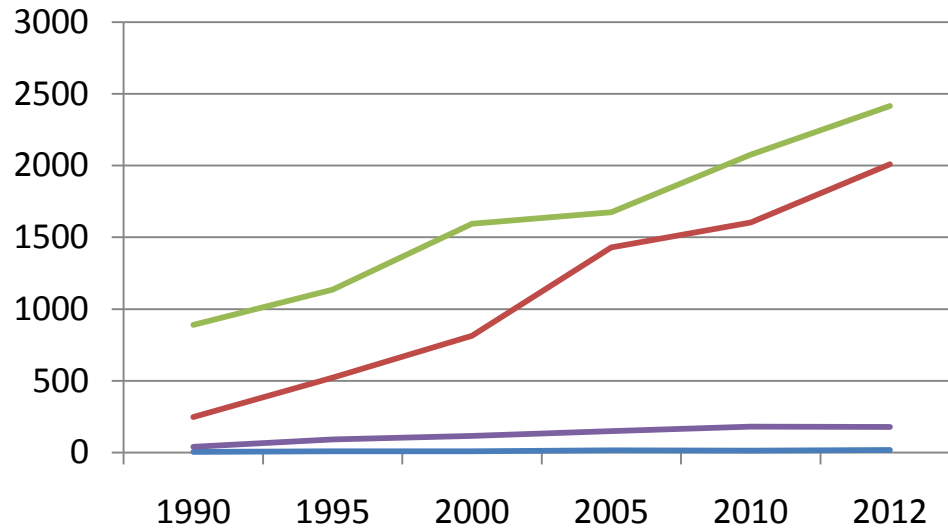
## World production (x 1000 tons) of food fish from inland aquaculture and mariculture by continent (excl. Asia)



## Inland production (x 1000 tons)

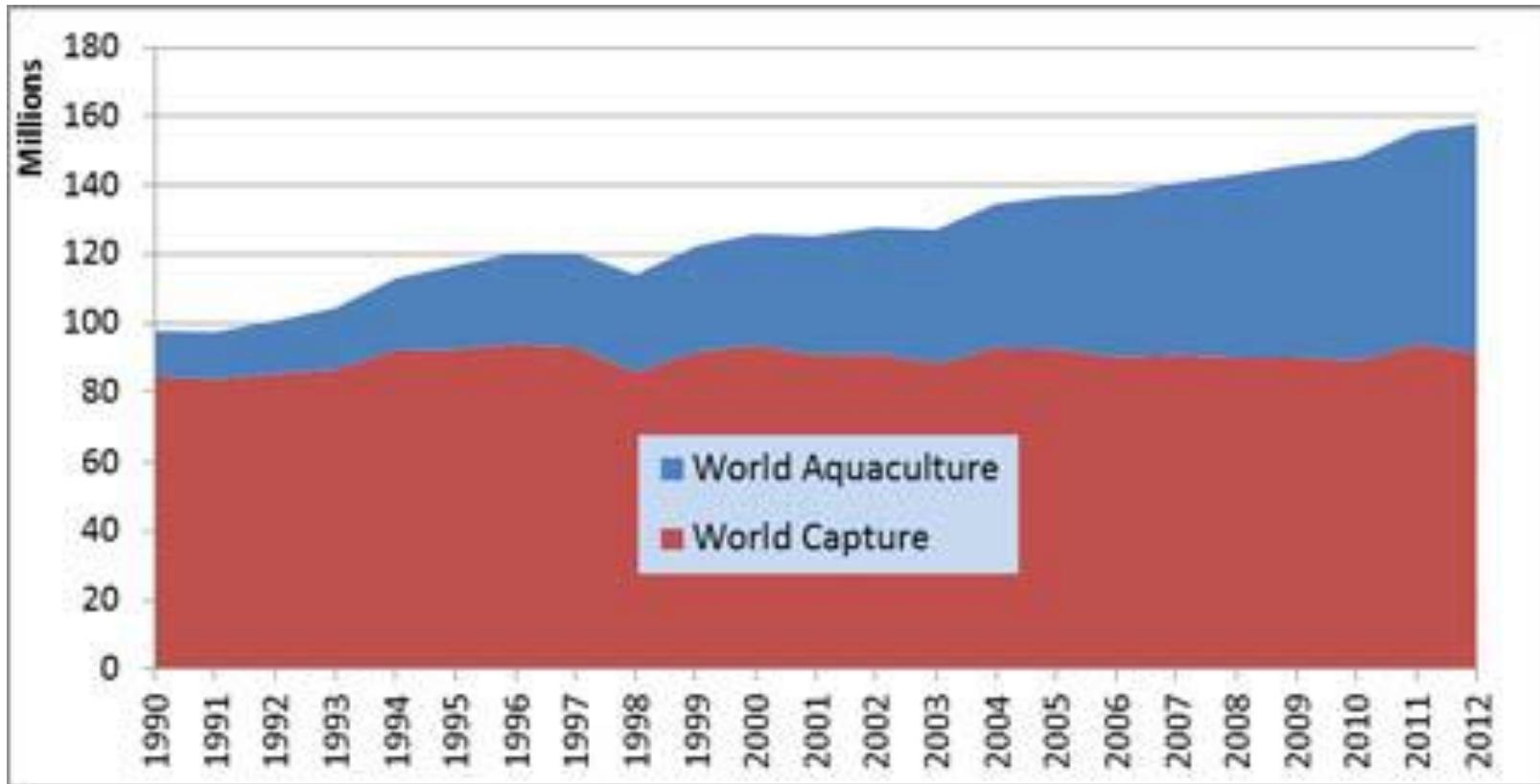


## Marine production (x 1000 tons)

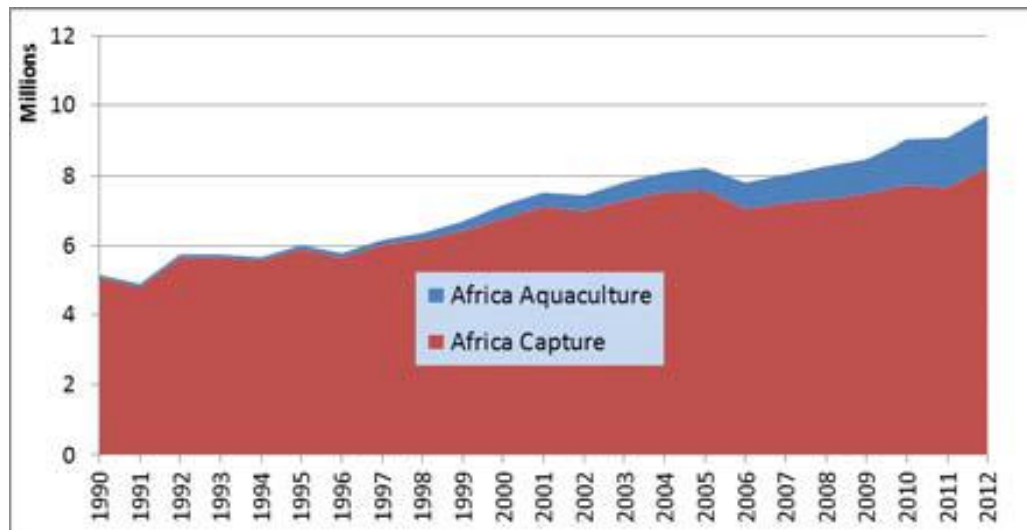
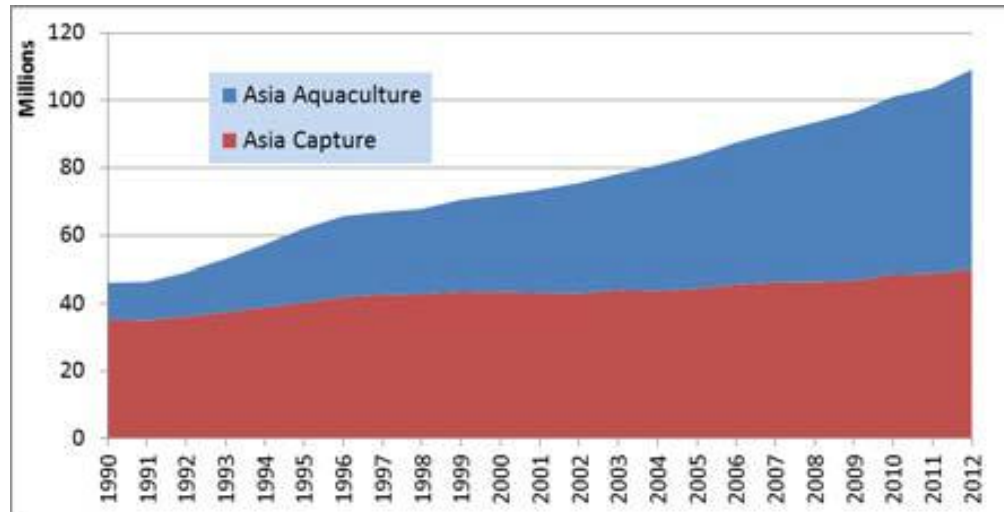




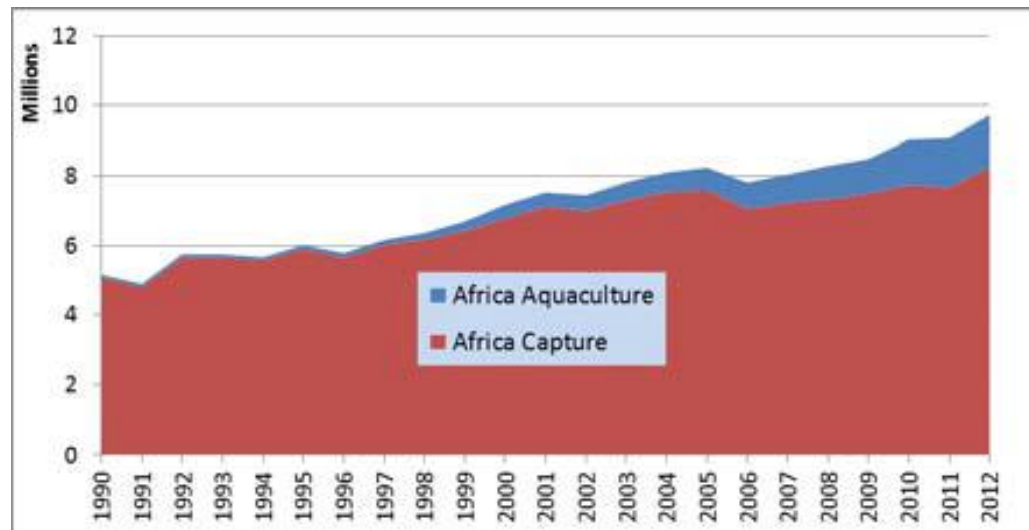
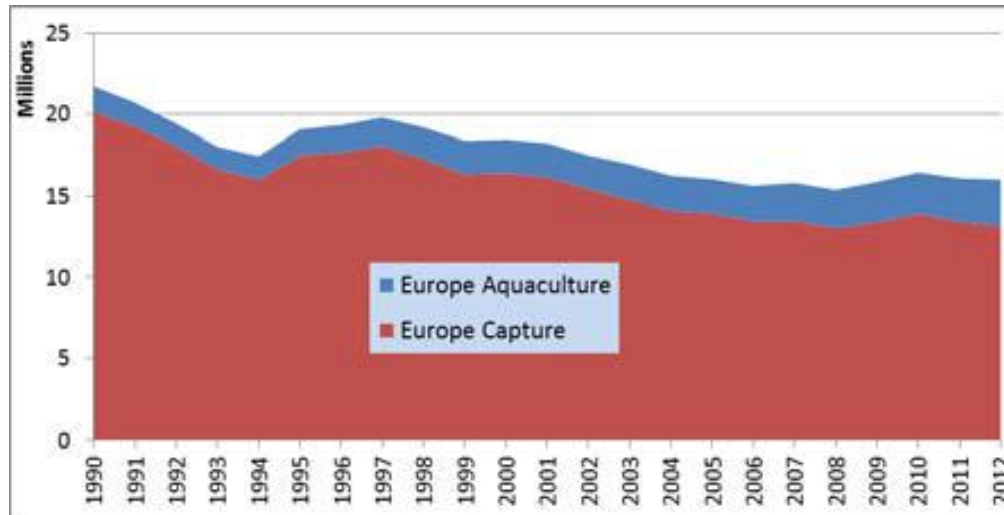
## Contribution per continent of aquaculture to total fish production (excluding aquatic plants)



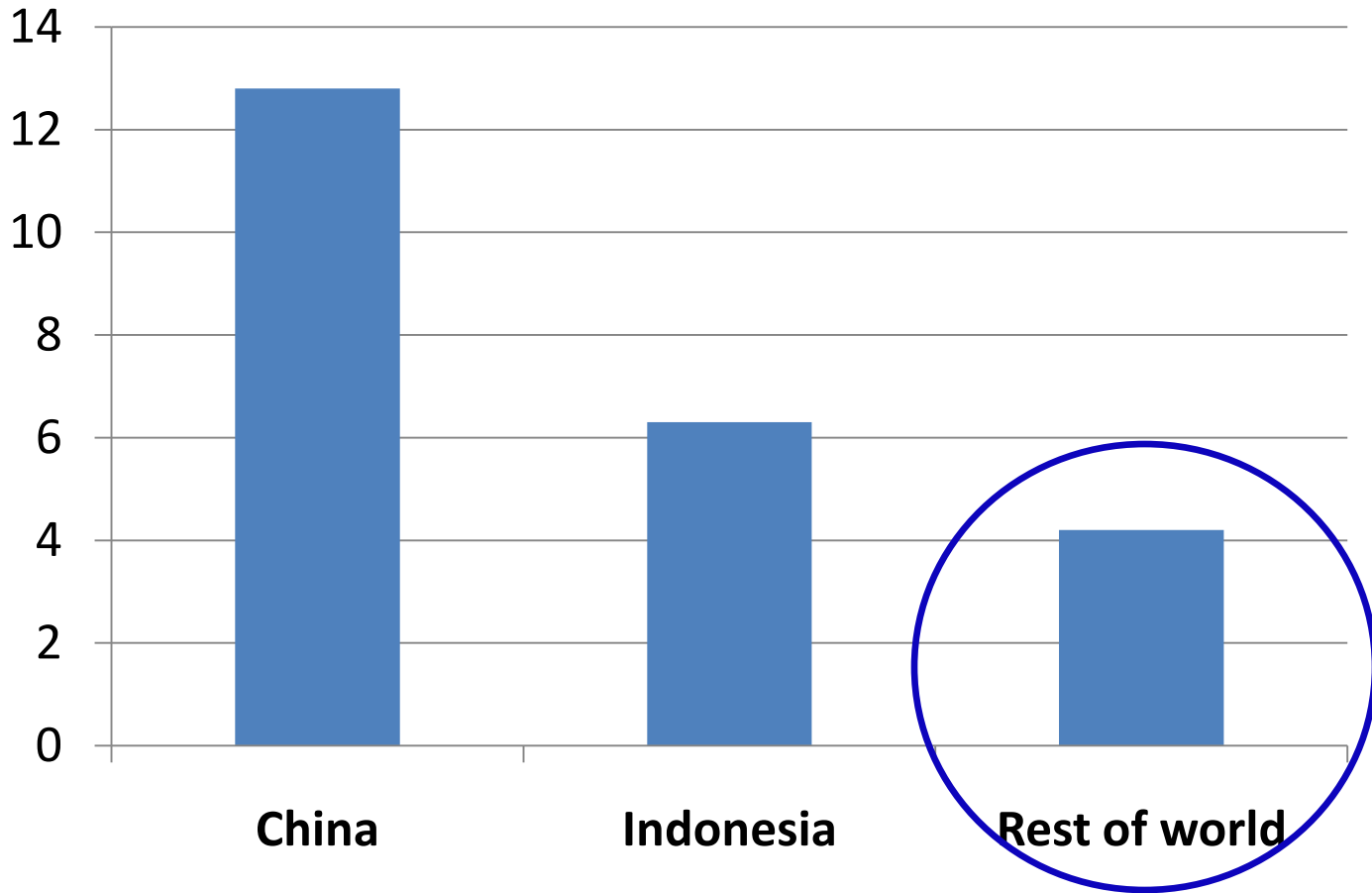
## Contribution per continent of aquaculture to total fish production (excluding aquatic plants)



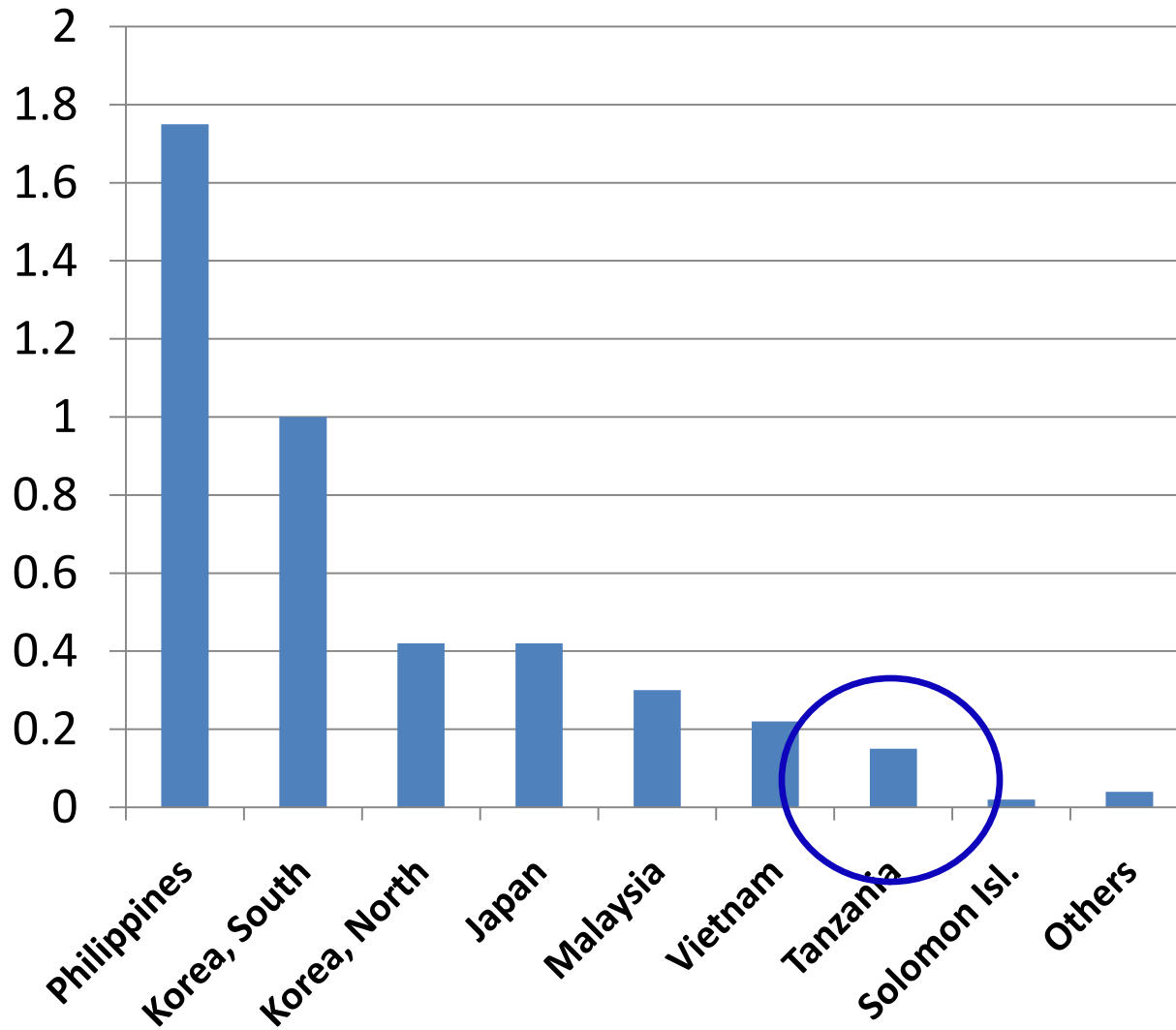
## Contribution per continent of aquaculture to total fish production (excluding aquatic plants)



## World farmed aquatic algae and major producers in 2012 (in million tonnes wet weight)



## World farmed aquatic algae and major producers in 2012 (in million tonnes wet weight)



# Top food fish aquaculture producers in Africa (2012)

Country	Tonnes	Percent
Egypt	1 017 738	68.5
Nigeria	253 898	17.1
Uganda	95 906	6.5
Ghana	27 450	1.8
Kenya	21 488	1.4
Zambia	12 988	0.9
Madagascar	8 588	0.6
Tunisia	8 577	0.6
Zimbabwe	8 010	0.5
South Africa	3 999	0.3
Côte d'Ivoire	3 720	0.3
Tanzania	3 407	0.2
Malawi	3 232	0.2
Congo DR	2 869	0.2
Algeria	2 648	0.2
Rest of Africa	10 849	0.7
<b>TOTAL</b>	<b>1 485 367</b>	<b>100</b>

92.1%

# Aquaculture production in Africa (incl. N-Africa)

- 8.3 % growth over 10 years; 10.9 % in 2005-2007
- negative growth in some countries; growth limited to but few countries

## sub-Saharan Africa

- 93.4 % tonnage coming from **freshwater, mainly fish**
- **annual per capita fish consumption 5-10 kg**
- for comparison: **global** average 19 kg; WHO's **recommendation** 25 kg

# Annual production of catfish (2011) *Clarias gariepinus*

Continent	Total production 2011 (ton)
Asia	2 950 000
Africa	220 000
Americas	173 000
Europe	7 316

**and further Nile tilapia (*Oreochromis niloticus*)**

**Carp species (*Cyprinus* et others)**

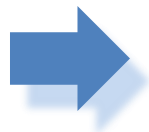
**Nile perch (*Lates niloticus*)**



# Constraints, bottlenecks etc...

## ... the general framework

- **Institutional/legal framework** to support aquaculture development in general is underway
- Sometimes inadequate **capacity building** and **educational framework**
- **Dispersed nature** of initiatives within and across national boundaries
- Sometimes uncertainty on **land ownership and/or use**
- Competition for (fresh) **water resources**
- Sometimes **limited social acceptance** of fish culture/consumption



**role of aquaculture** as significant contributor to livelihood is still relatively small (though some countries are more advanced and/or are catching up at fast pace)

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Urapmin taboos still widely observed.<sup>[32]</sup>

**Fish** [\[edit\]](#)

# “fish taboo”?

Speak not to me with a mouth that eats fish

—Somali nomad taunt<sup>[33]</sup>

Among the [Somali people](#), most [clans](#) have a taboo against the consumption of fish, and do not intermarry with the few occupational clans that do eat it.<sup>[34][35]</sup>

There are taboos on eating fish among many upland [pastoralists](#) and [agriculturalists](#) (and even some coastal peoples) inhabiting parts of southeastern [Egypt](#), [Ethiopia](#), [Eritrea](#), [Somalia](#), [Kenya](#), and northern [Tanzania](#). This is sometimes referred to as the "Cushitic fish-taboo", as Cushitic speakers are believed to have been responsible for the introduction of fish avoidance to [East Africa](#), though not all Cushitic groups avoid fish. The zone of the fish taboo roughly coincides with the area where [Cushitic languages](#) are spoken, and as a general rule, speakers of [Nilo-Saharan](#) and [Semitic languages](#) do not have this taboo, and indeed many are watermen.<sup>[35][36]</sup> The few [Bantu](#) and [Nilotic](#) groups in East Africa that do practice fish avoidance also reside in areas where [Cushites](#) appear to have lived in earlier times. Within East Africa, the fish taboo is found no further than Tanzania. This is attributed to the local presence of the [tsetse fly](#) and in areas beyond, which likely acted as a barrier to further southern migrations by [wandering pastoralists](#), the principal fish-avoiders. [Zambia](#) and [Mozambique's](#) Bantus were therefore spared subjugation by pastoral groups, and they consequently nearly all consume fish.<sup>[35]</sup>

There is also another center of fish avoidance in [Southern Africa](#), among mainly [Bantu speakers](#). It is not clear whether this disinclination developed independently or whether it was introduced. It is certain, however, that no avoidance of fish occurs among southern Africa's earliest inhabitants, the [Khoisan](#). Nevertheless, since the Bantu of southern Africa also share various cultural traits with the pastoralists further north in East Africa, it is believed that, at an unknown date, the taboo against the consumption of fish was similarly introduced from East Africa by cattle-herding peoples who somehow managed to get their livestock past the aforementioned tsetse fly endemic regions.<sup>[35]</sup>

Certain species of fish are also forbidden in Judaism such as the freshwater [eel](#) ([Anguillidae](#)) and all species of [catfish](#). Although they live in water, they appear to have no fins or scales (except under a microscope) (see [Leviticus 11:10-13](#)<sup>[37]</sup>). Sunni Muslim laws are more flexible in this and catfish and shark are generally seen as [halal](#) as

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## The Aquatic Civilization of Middle Africa\*

J. E. G. Sutton<sup>a1</sup>

<sup>a1</sup> Ahmadu Bello University, Zaria

# traditional fish culture ?

Between the ninth and third millennia B.C. wetter conditions prevailed over most of Africa. Lakes and rivers were fuller and some of the internal basins were temporarily linked, especially in the 'Middle African' belt. This comprises the southern Sahara and Sahel, stretching from the Upper Niger to the Middle Nile, with a south-easterly extension into the Upper Nile basin and the East African rift valleys. This situation was exploited by people who developed a decidedly aquatic economy and culture. From their waterside camps and settlements archaeologists have recovered bones of fish and aquatic animals which these people ate, as well as the distinctive harpoon-heads carved from bone with which they obtained them, and also pottery, bearing peculiar decoration executed with fish-bones and water-shells, made in imitation of (fishing-) baskets. Boating and other cultural developments are deducible. The harpoons date back to 7,000 B.C. at least; the pottery dates back to more than 6,000 B.C. and was clearly an African invention. It reflects important developments in gastronomy and home life.

In the Kenya rift valley the main stage of Leakey's 'Kenya Capsian' culture is essentially the local manifestation of this far-flung 'aquatic civilization'.

Its greatest extent was achieved during the wettest times of the seventh millennium B.C., and probably involved the expansion of Negroid peoples across this continent-wide savanna belt. Also explained perhaps is the extensive, though now fragmented, distribution of languages which Greenberg combines in his 'Nilo-Saharan' super-family. It is suspected that aspects of this ancient aquatic way of life may be maintained or reflected by latter-day isolated or 'unclean' lake or swamp communities. This subject has been largely neglected by African culture-historians.

Drier conditions in the late sixth and fifth millennia B.C. signalled a decline of this aquatic civilization and, in particular, broke its geographical continuity. Nevertheless, there was a qualified revival in many parts in the fourth and third millennia. In the Kenya rift this later phase seems to equate with the first stage of the 'stone bowl cultures'. Around Lake Victoria a devolved relic survived until the eve of Bantu expansion about two thousand years ago. Other late or modified examples are known on the Nile and in the western Sudan. Generally, however, the viability and prestige of an aquatic way of life were undermined by the second millennium B.C. In the Sahara and Sahel as well as in the northern parts of eastern Africa this decline was paralleled by the

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# Constraints, bottlenecks etc...

## ... and more specific

- heavy focus on some **freshwater fish species**;
- brackishwater and marine fish culture, culture of crustaceans, molluscs and algae: (relatively) recent developments: < 20-30 years ago  
(but **local market for these products is limited**)

### **diversification of locally accepted species needed**

- lack of "**seed and feed**" (breeding programmes; quality certification)
- overall lack of **proper technology**
- few rules in place for **food safety and animal health**
- in need of **integration** of aquaculture with other farming activities  
accompanied with proper **policies in marketing and trade**

# Key points favouring growth of aquaculture in Africa

- important **water resources** (e.g. inland lakes and reservoirs)
- agriculture in broad sense plays a **dominant role** in most African economies as an important source of livelihood;
- opportunities for **integrated production**, production combined with **mangrove reforestation**....
- growing **awareness** at governmental level ('National Fisheries and Aquaculture Development Plans') alongside terrestrial crops – but further consolidation of the idea that aquaculture can create wealth
- establishment of **networks** (e.g. SARNISSA)
- substantial economic growth in a number of countries; growing foreign investments

## Key points favouring growth of aquaculture in Africa

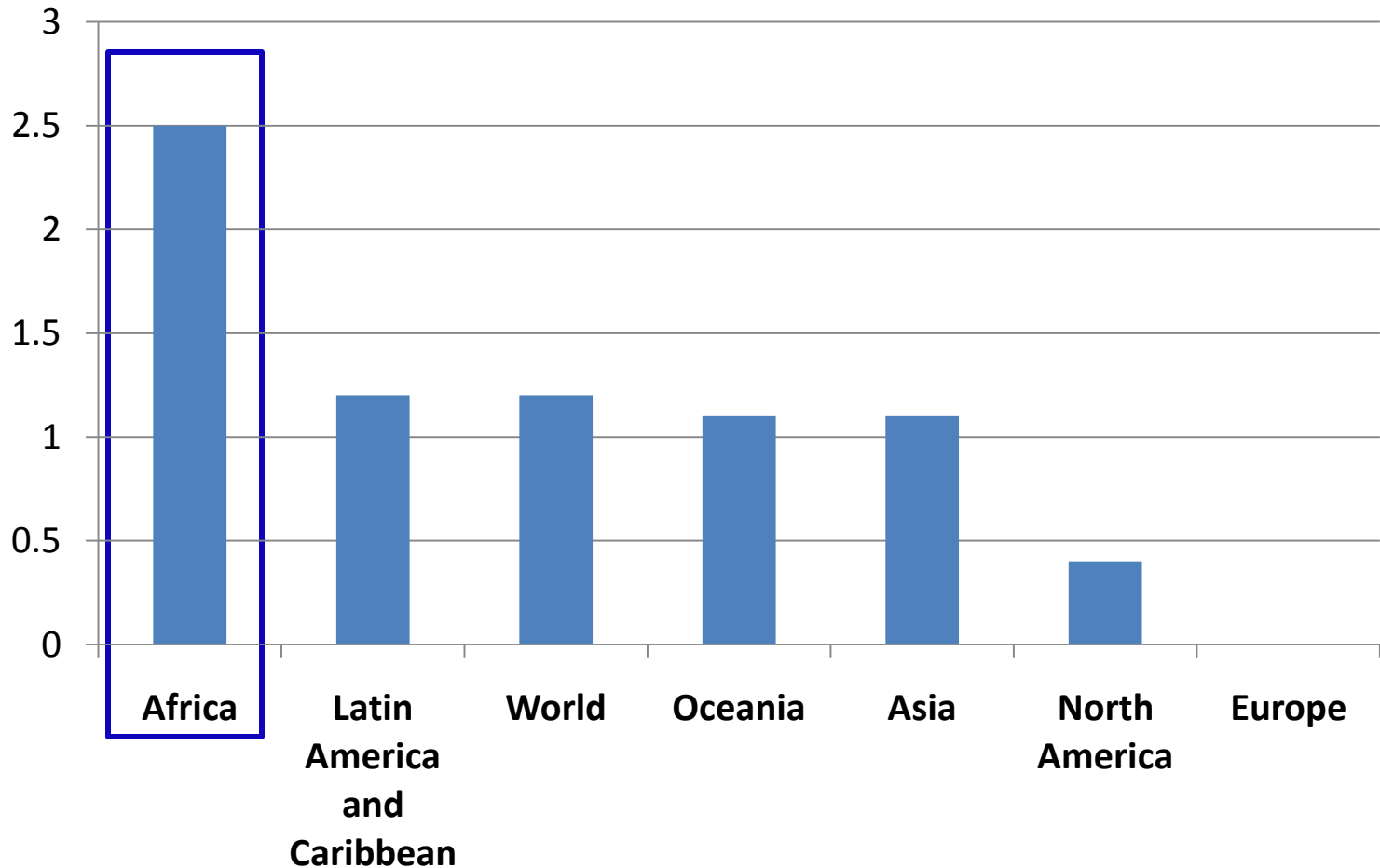
### Gross Domestic Product (GDP) growth (%) by continent and decade (source: [www.worldeconomics.com](http://www.worldeconomics.com))

	'61-70	'71 - 80	'81-90	'91 - 00	'01 - 10	'61-13
Asia	7.1	4.5	5.9	5.0	6.4	5.8
Americas	4.7	4.1	2.7	3.3	2.0	3.3
Europe	5.3	3.1	2.2	1.3	2.0	2.7
Africa	4.3	4.2	2.8	2.7	4.7	3.7

### Per capita GDP growth (%) by continent and decade

	'61-70	'71 - 80	'81-90	'91 - 00	'01 - 10	'61-13
Asia	4.5	2.4	3.8	3.6	5.2	3.9
Americas	2.6	2.3	1.1	1.8	0.9	1.7
Europe	3.4	2.5	1.7	1.1	1.7	2.0
Africa	1.7	1.5	0.0	0.3	2.3	1.2

# Natural human population growth rate (%) per continent in 2014



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is there any other option than developing aquaculture ?



Thank you

