

# Aquafeed production in Africa, and future prospects for fishmeal and fish oil

Rodrigue Yossa, PhD, PMP, Scientist - Fish Feeds & Nutrition,  
Sustainable Aquaculture, WorldFish, Malaysia





# Aquafeed production in Africa, and future prospects for fishmeal and fish oil

Rodrigue Yossa, WorldFish, Penang, Malaysia

Shanghai, China, 6 November 2019



RESEARCH  
PROGRAM ON  
Fish

Led by WorldFish

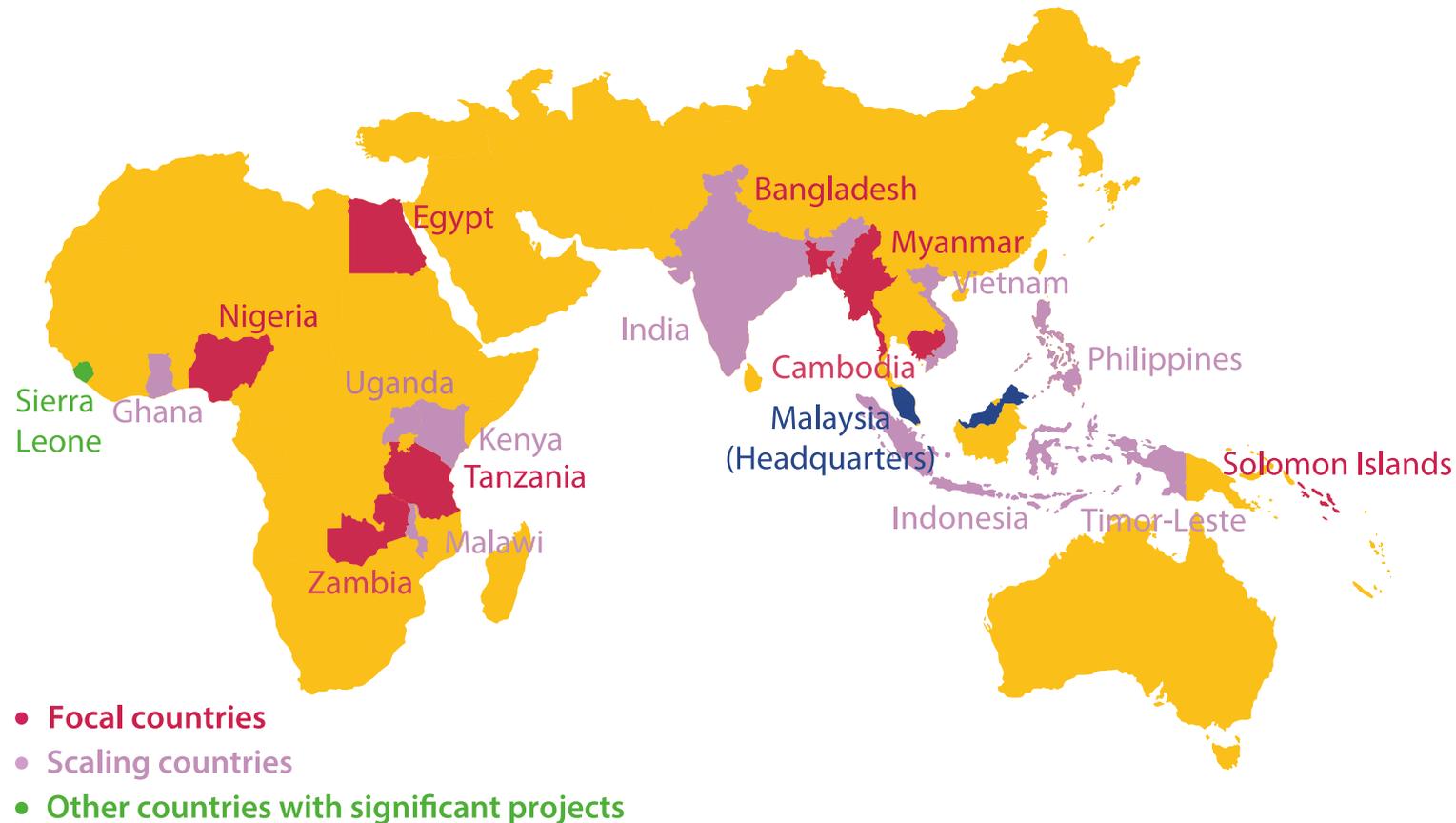
# Content

---

1. Introduction to WorldFish and FISH CRP
2. Aquaculture in Africa
3. Available ingredients
4. Aquafeed in Africa
5. Use of Fishmeal and Fish Oil
6. Forward look

# Introduction to WorldFish

Mission: To strengthen livelihoods and enhance food and nutrition security by improving fisheries and aquaculture



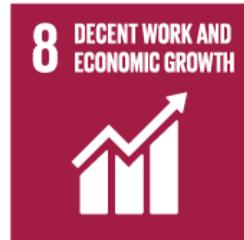
# Introduction to WorldFish

## WorldFish contribution to the SDGs

Direct Influence:



Contribution to:

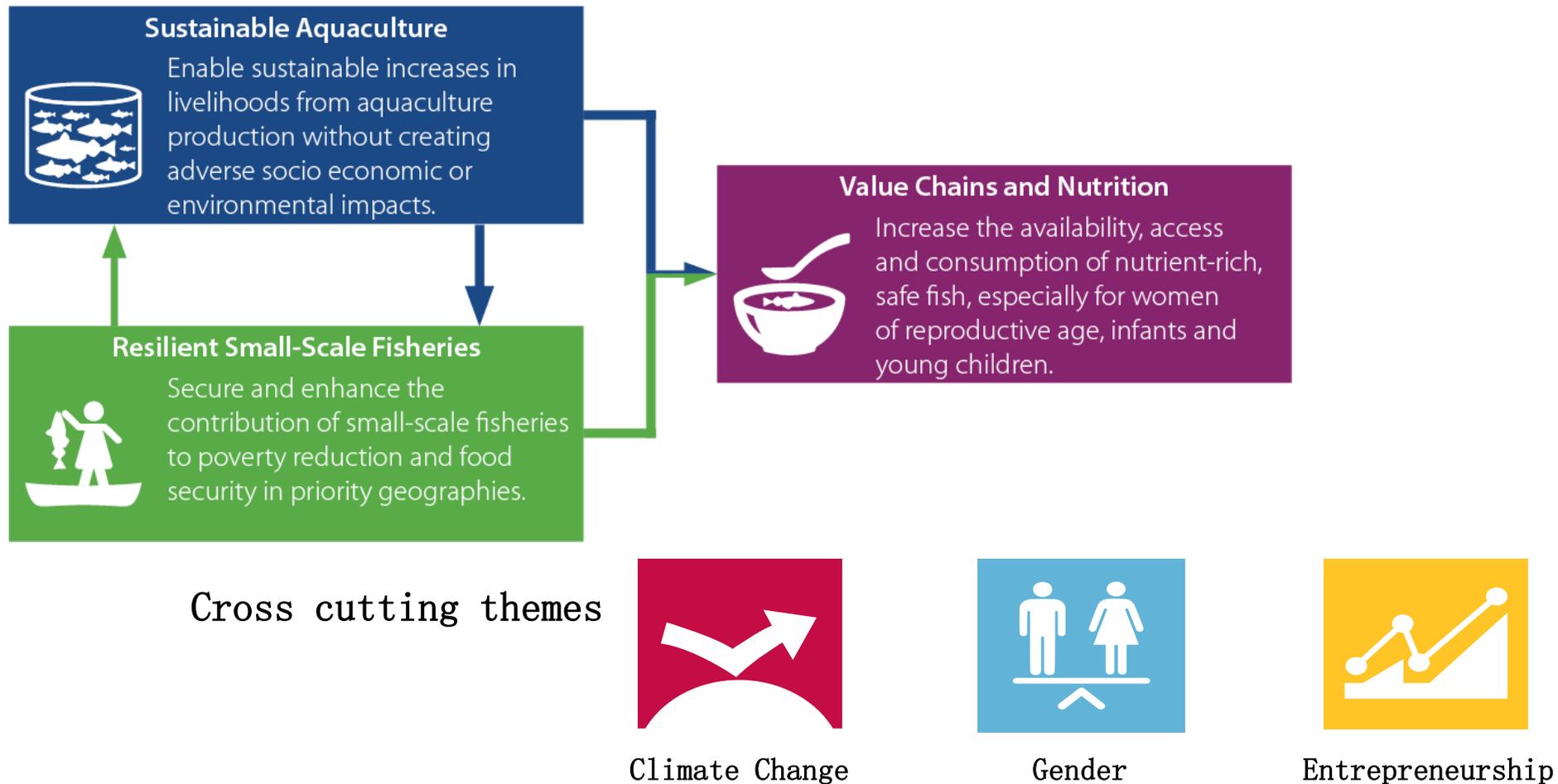


Strong Support:

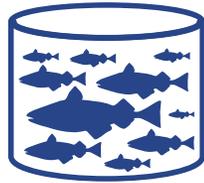


# Introduction to FISH CRP

WorldFish leads the 2017–2022 CGIAR Research Program on Fish Agri-Food Systems (FISH)



# Introduction to FISH CRP



**5M**

producer households adopt improved breeds, feeds, fish health and best management practices



**3.5M**

people assisted to exit poverty through gender-inclusive livelihood improvements



**2.4M**

fewer women, men and children suffering from deficiencies in essential micronutrients



**3.3M**

hectares of ecosystems restored through productive and equitable management



**4.7M**

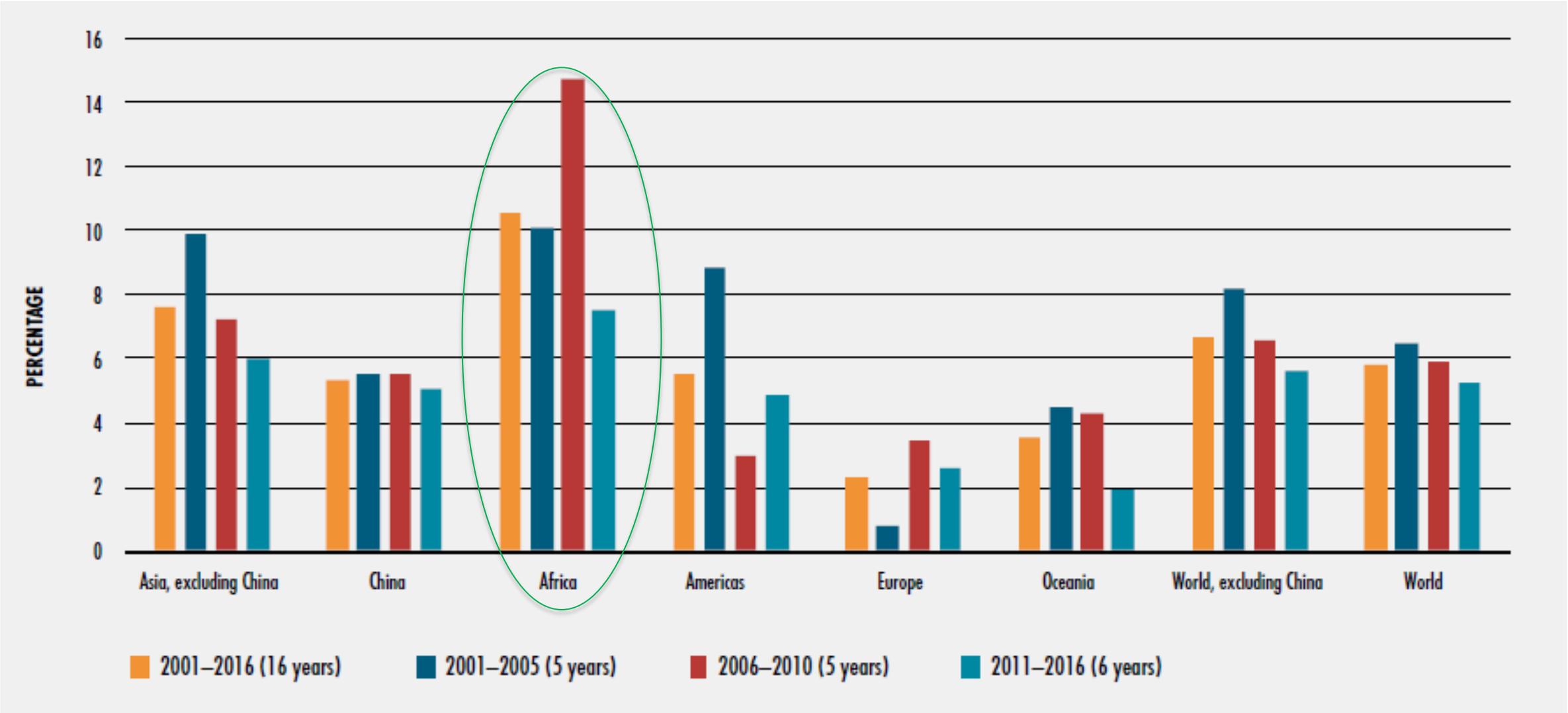
more women of reproductive age consuming an adequate number of food groups



**4.8M**

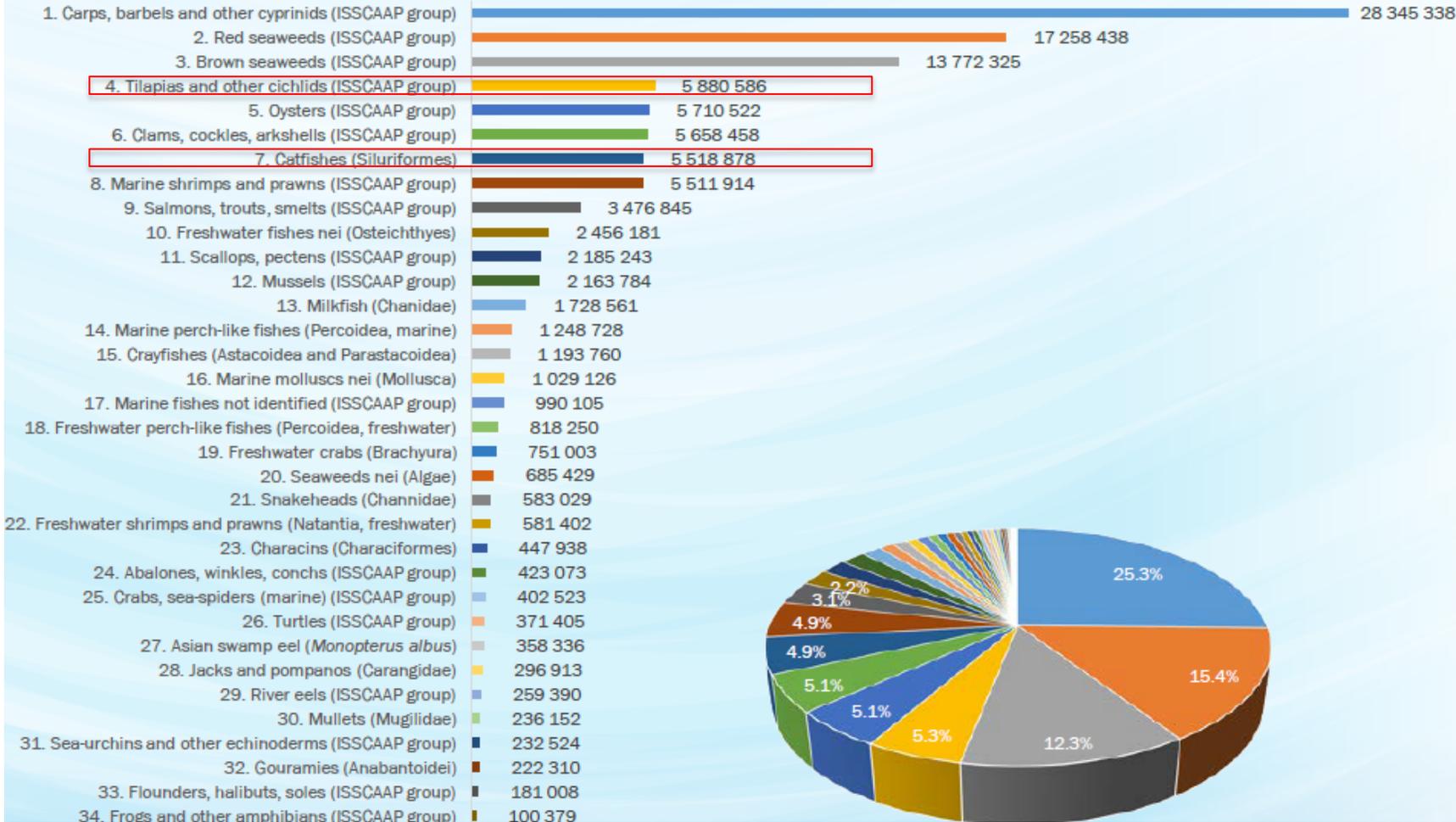
tonnes of fish farmed annually with improved climate resilience and reduced environmental impact

# Aquaculture in Africa



# Aquaculture in Africa

World aquaculture production quantity (2017): 111 946 623 tonnes



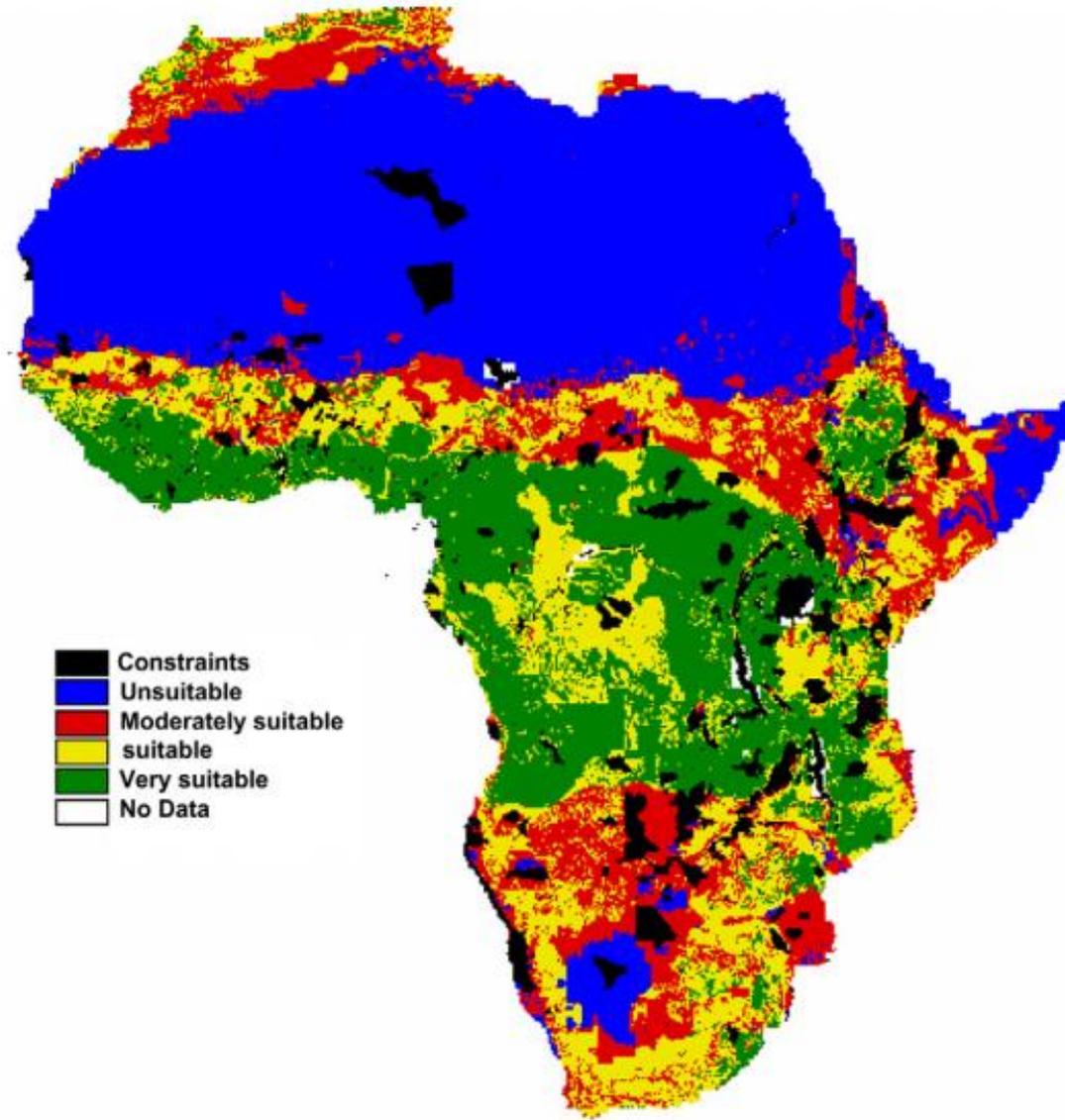
# Aquaculture in Africa

## AQUACULTURE FOOD FISH PRODUCTION BY REGION AND SELECTED MAJOR PRODUCERS (thousand tonnes; percentage of world total)

Region/selected countries	1995	2000	2005	2010	2015	2016
<b>Africa</b>	110	400	646	1 286	1 772	1 982
	0.5%	1.2%	1.5%	2.2%	2.3%	2.5%
<b>Egypt</b> 	72	340	540	920	1 175	1 371
	0.3%	1.1%	1.2%	1.6%	1.5%	1.7%
<b>Northern Africa, excluding Egypt</b>	4	5	7	10	21	23
	0%	0%	0%	0%	0%	0%
<b>Nigeria</b> 	17	26	56	201	317	307
	0.1%	0.1%	0.1%	0.3%	0.4%	0.4%

FAO, 2018

# Aquaculture in Africa

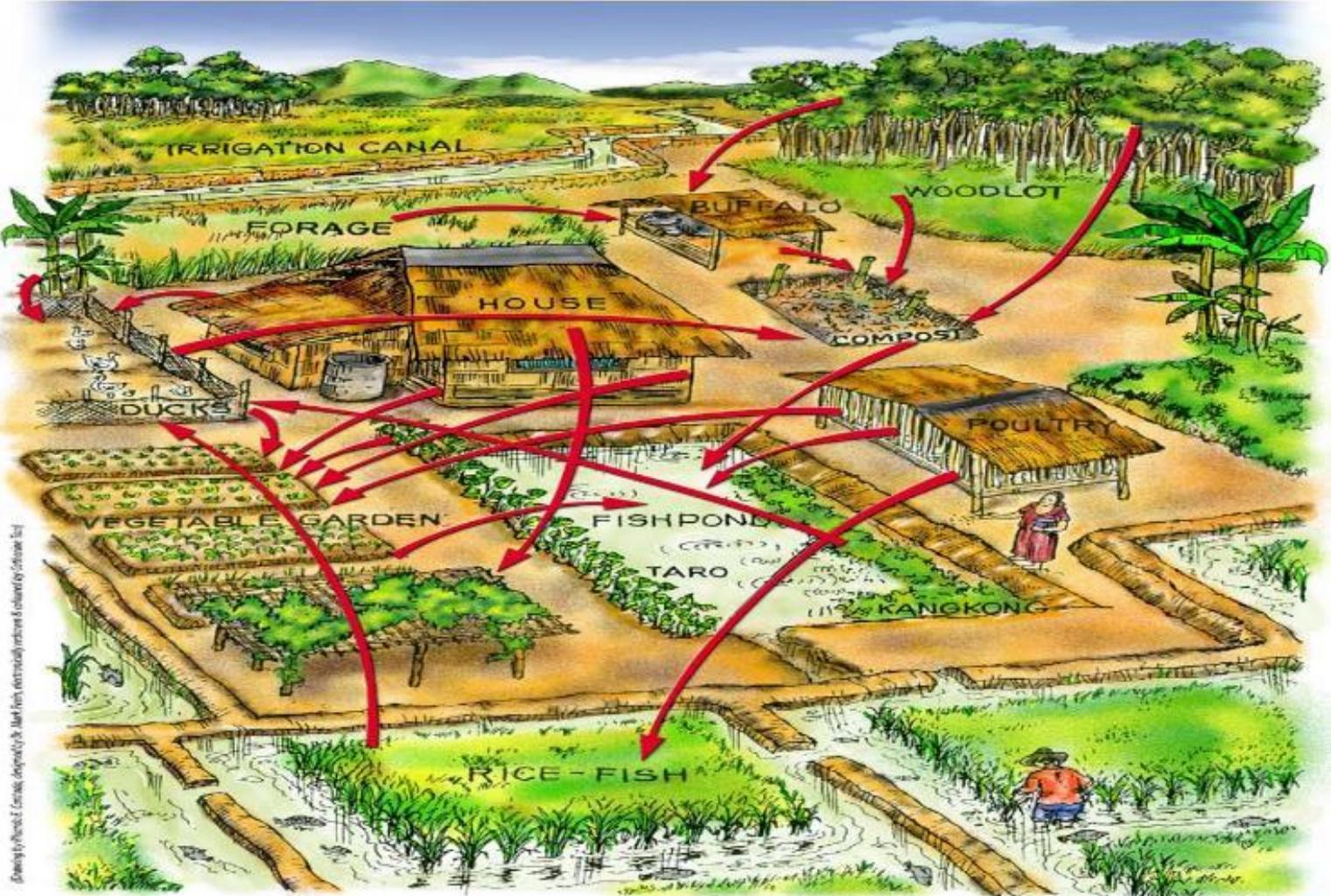


Brummett et al., 2008

borrowed from

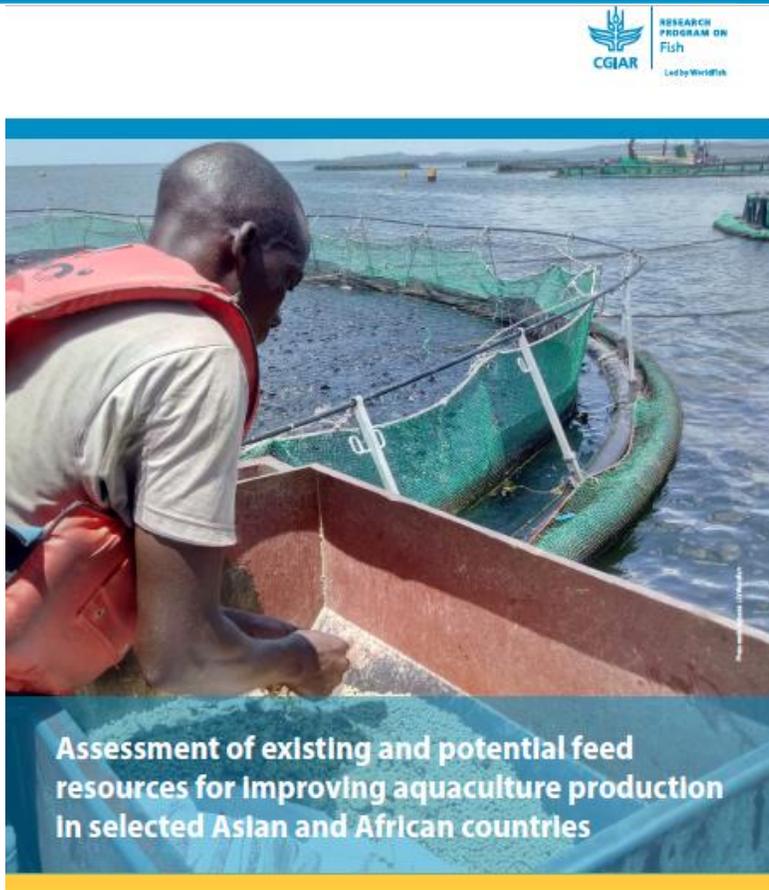
Aguilar-Manjarrez and Nath, 1998

# Available Ingredients



© 2010 CGIAR Research Program on Fish, All rights reserved. This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

# Available Ingredients

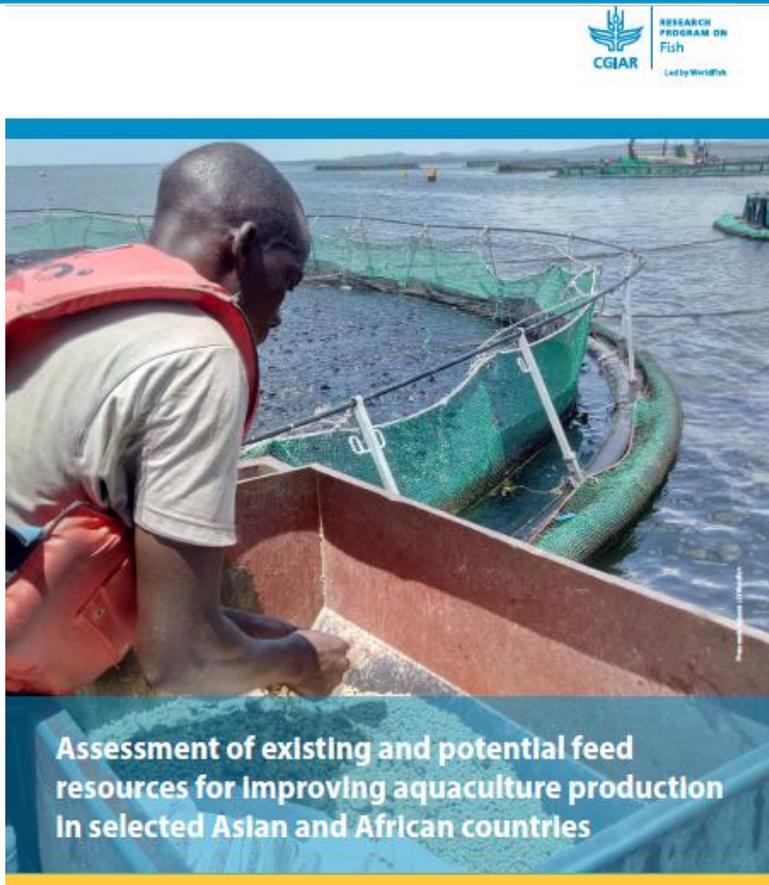


Bangladesh, Myanmar, Malaysia, Egypt, Nigeria and Zambia

## Criteria:

- Availability (more than 1000 mt per year),
- Affordability,
- Nutritional value, associated constraints (presence of antinutritional factors and mycotoxins),
- Feed-food competition,
- Environmental impact, and
- Sociocultural implications.

# Available Ingredients



## Plant protein sources

Soybean meal, mustard oilcake, sesame meal, sunflower meal, groundnut cake, copra cake, palm kernel cake and cotton seed meal.

## Animal protein sources

Poultry meal, feather meal and blood meal.

## Energy and fiber ingredients

Abundantly available and are mainly of plant origin.

## Where are fishmeal and fish oil????



# Aquafeed in Africa



# Aquafeed in Africa

FAO 2018

AQUACULTURE FOOD FISH PRODUCTION BY REGION AND SELECTED MAJOR PRODUCERS  
(thousand tonnes; percentage of world total)

Region/selected countries	1995	2000	2005	2010	2015	2016
Africa	110 0.5%	400 1.2%	646 1.5%	1 286 2.2%	1 772 2.3%	1 982 2.5%
Egypt 	72 0.3%	340 1.1%	540 1.2%	920 1.6%	1 175 1.5%	1 371 1.7%
Northern Africa, excluding Egypt	4 0%	5 0%	7 0%	10 0%	21 0%	23 0%
Nigeria 	17 0.1%	26 0.1%	56 0.1%	201 0.3%	317 0.4%	307 0.4%

Egypt accounts for 68%  
Nigeria accounts for 16%

85% African  
Aquaculture

Tilapia in Egypt + catfish in Nigeria = 57% of African  
Aquaculture in 2016

Tacon, 2018

**Egypt** produced 940,309 mt tilapia (69% Egyptian aquaculture)  
91% tilapia production on commercial feed, and EFRC of 1.7

→ 1 451 000 mt feed for tilapia (15.9% of global tilapia industry) in 2016

**Nigeria** produced 194,977 mt catfish (64% Nigerian aquaculture)  
80% tilapia production on commercial feed, and EFRC of 1.3

→ 200 146 mt feed for catfish (3.8% of global catfish industry) in 2016

**Total: 1 651 146 mt feed** (for 57% of African aquaculture)

→ 100% = 2 896 747 mt???

# Use of Fishmeal and Fish Oil

**Tilapia in Egypt + catfish in Nigeria = 57% of African Aquaculture in 2016 (1 651 146 mt feed )**

## 2 scenarios

i) 10% fishmeal + 1% fish oil diet for catfish and tilapia

Fishmeal: 165 114.6 mt

Fish oil: 16 511.46 mt feed

ii) 15% fishmeal + 2% fish oil diet for catfish and tilapia

Fishmeal: 247 671.9 mt feed

Fish oil: 33 0022.92 mt feed



# Forward Look

10% growth in African aquaculture = 10% growth in feed market?

**Total for tilapia in Egypt and catfish in Nigeria (57% of African Aquaculture in 2016)**

1 651 146 mt feed + 10% ???

= 1 816 260 mt feed in 2017

= 1 997 886 mt feed in 2018

= 2 197 675 mt feed in 2019

= 2 417 442 mt feed in 2020

= 2 659 187 mt feed in 2021

= 2 925 105 mt feed in 2022

What quantity of marine ingredients will be used???

# Forward Look

Sustainability, Sustainability, Sustainability!!!!

 nature

Letter | Published: 25 September 2019

## Harnessing global fisheries to tackle micronutrient deficiencies

Christina C. Hicks , Philippa J. Cohen, Nicholas A. J. Graham, Kirsty L. Nash, Edward H. Allison, Coralie D'Lima, David J. Mills, Matthew Roscher, Shakuntala H. Thilsted, Andrew L. Thorne-Lyman & M. Aaron MacNeil

*Nature* **574**, 95–98 (2019) | [Download Citation](#) ↓

FISHERIES

## Micronutrient richness of global fish catches

Analysis of the nutrient composition of fish caught around the globe reveals locations where the retention of fish for consumption by local populations could help to tackle human disease caused by nutrient deficiencies. [SEE LETTER P.95](#)

DANIEL PAULY

from foods such as maize (corn) or rice.  
Hicks and colleagues' data demonstrate

# Forward Look

Sustainability, Sustainability, Sustainability!!!!

MENU ▾

nature

Subscribe

EDITORIAL · 02 OCTOBER 2019

## Let fishers in Africa and Asia keep more of their catches

Fish farms are depriving children of essential micronutrients.



[PDF version](#)

### RELATED ARTICLES

**Read the paper: Harness global fisheries to tackle micronutrient deficiency**

**How the global fish market contributes to human micronutrient deficiency**

# Forward Look

**“Marine ingredients are more than just fishmeal and fish oil”**



# Thank You



RESEARCH  
PROGRAM ON  
Fish

Led by



In partnership with

