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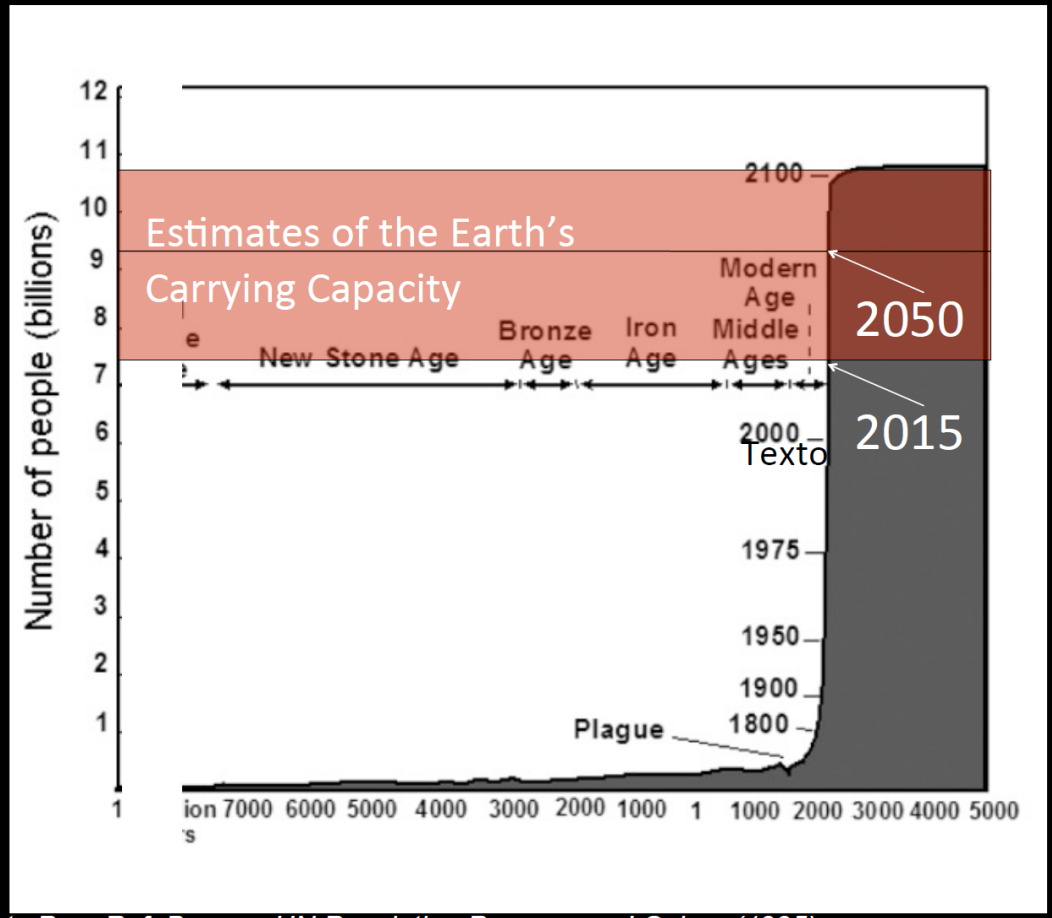
LA MITICULTURA, ¿ UNA ACTIVIDAD DE FUTURO ?

Xabier Irigoien

Muchos humanos

Toda charla sobre el futuro de la alimentación debe empezar con esta figura…

Rapid Growth of Human Population



Data Pop. Ref. Bureau ,UN Population Program and Cohen (1995)

Water
Arable land
Food

Crop area declined from 0.5 to 0.25 ha/capita 1960 and 2000 (CAWMA 2007),

Humanity is about to enter a new period of limited Earth's capacity to support furthe
growt

lunes, 14 noviembre 2011

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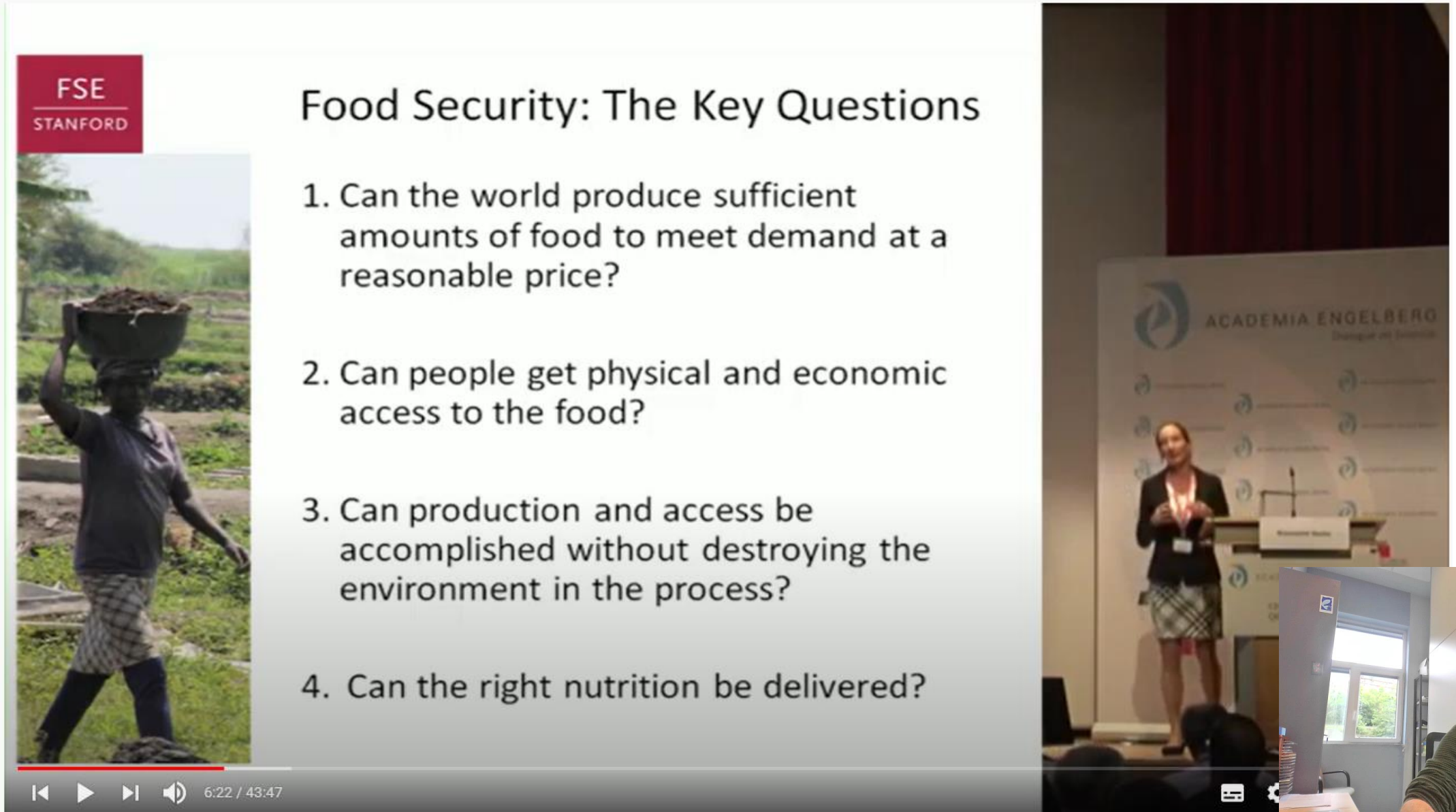
Solución magica

Y sigue con esta, una solución mágica que resuelve todos los problemas y no tiene ningún inconveniente…

Pero hay unas preguntas clave…



Pero hay unas preguntas clave…

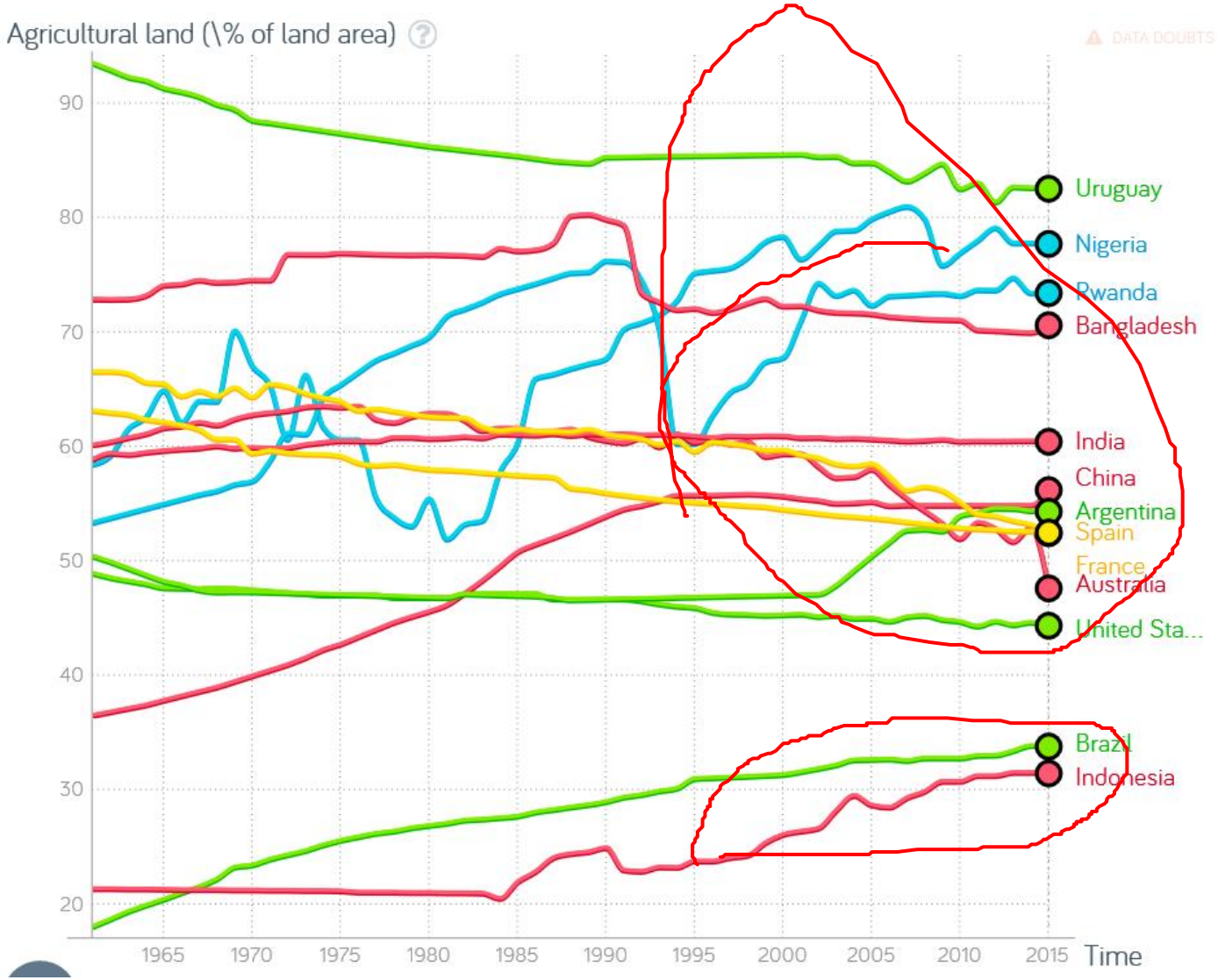
Existencia: Producción – agua dulce - energía

Acceso: Precio - distribución

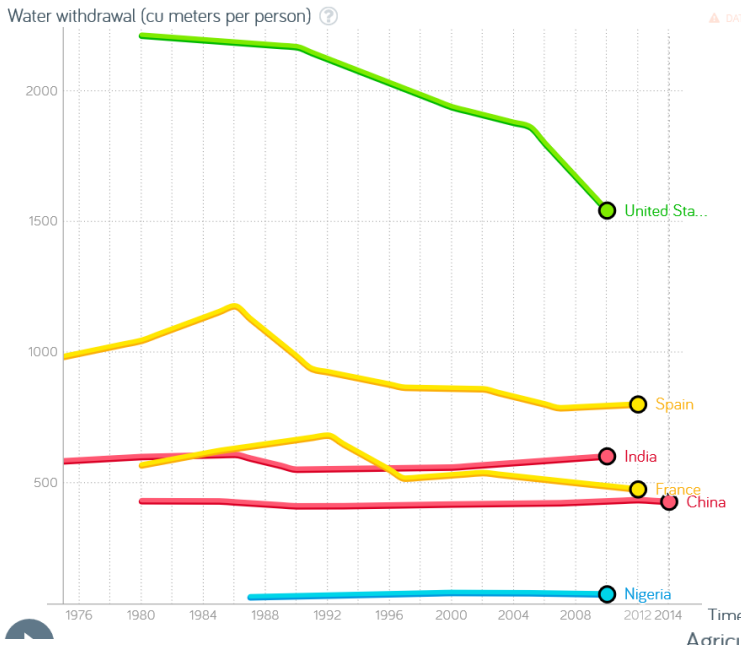
Estabilidad: Producción estable – medio ambiente

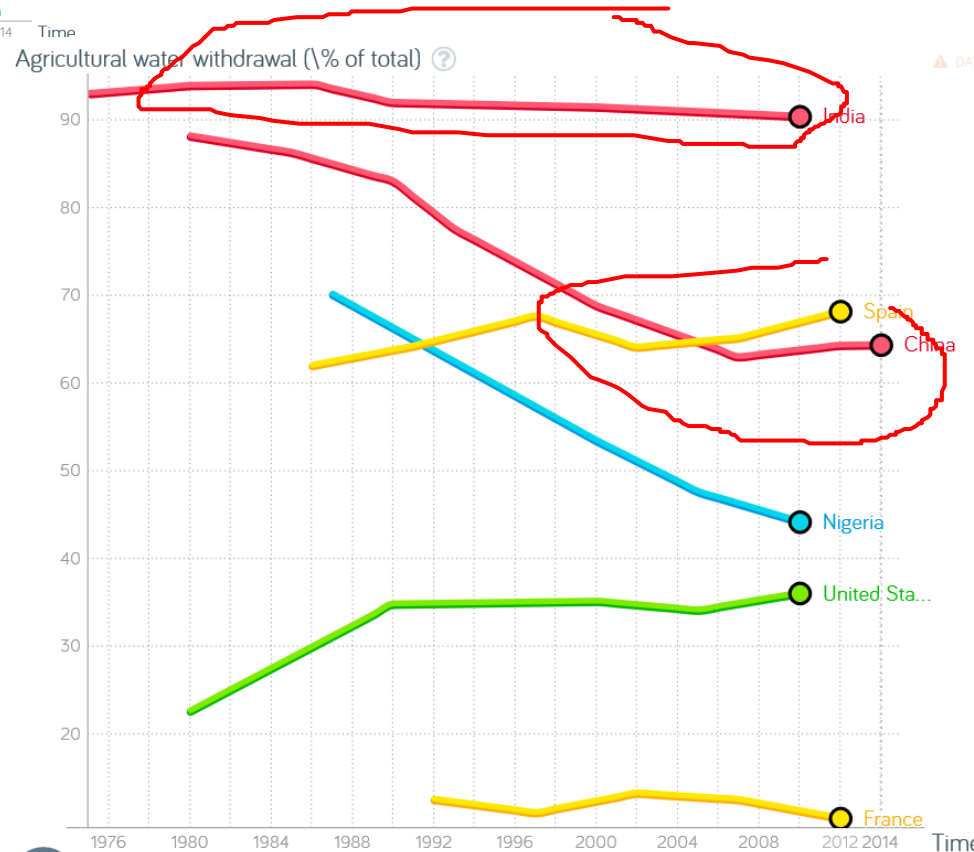
Nutrición: Calorías + micronutrientes

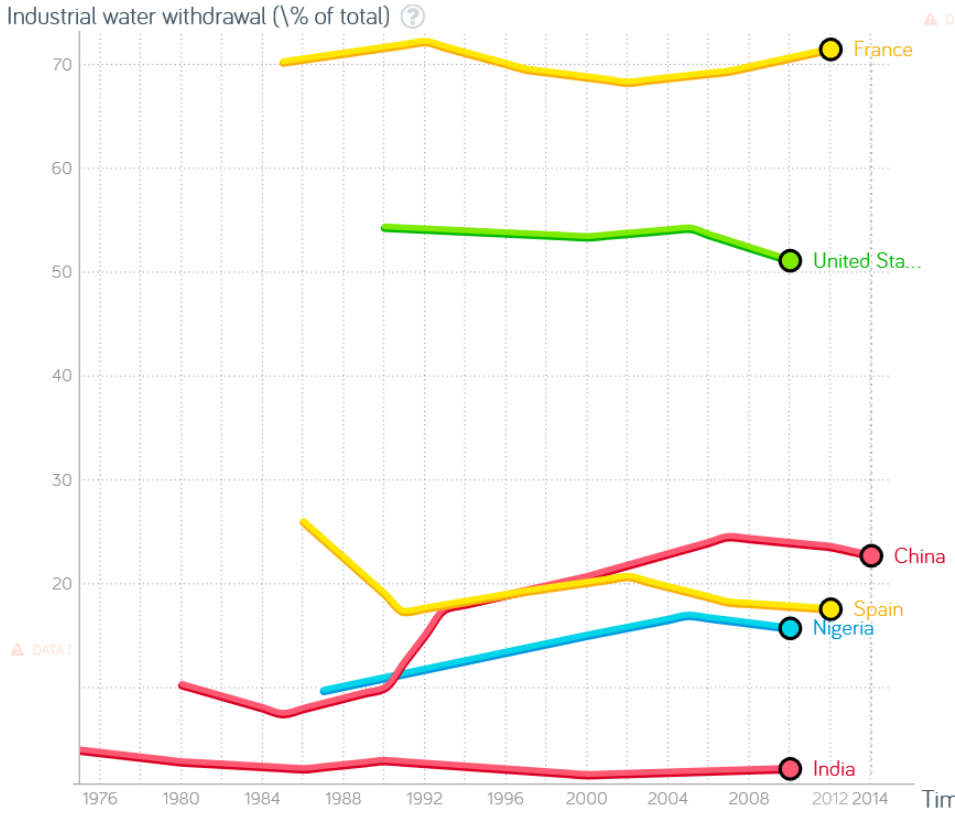
Tierra



Agua







Agua

Water consumption with food

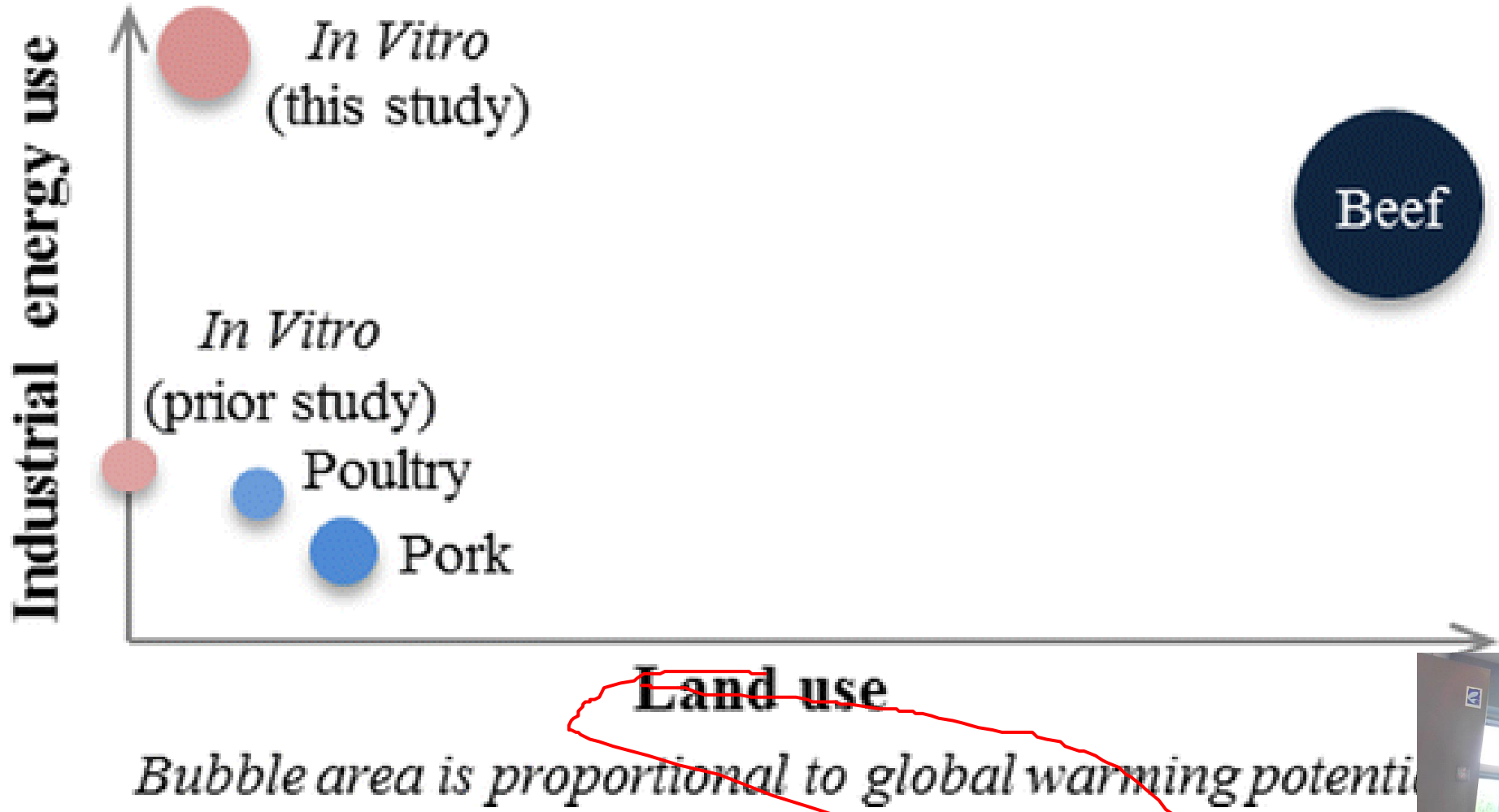
Subsistence diet: 1 m^3/cap day
Vegetarian diet: 2.6 m^3/cap day
USA diet: 5 m^3/cap day

1,17 m^3 per Kg grain
2 Kg grain/Kg fish
2 Kg grain/Kg poultry
4 Kg grain/Kg pig
7 Kg grain/Kg beef

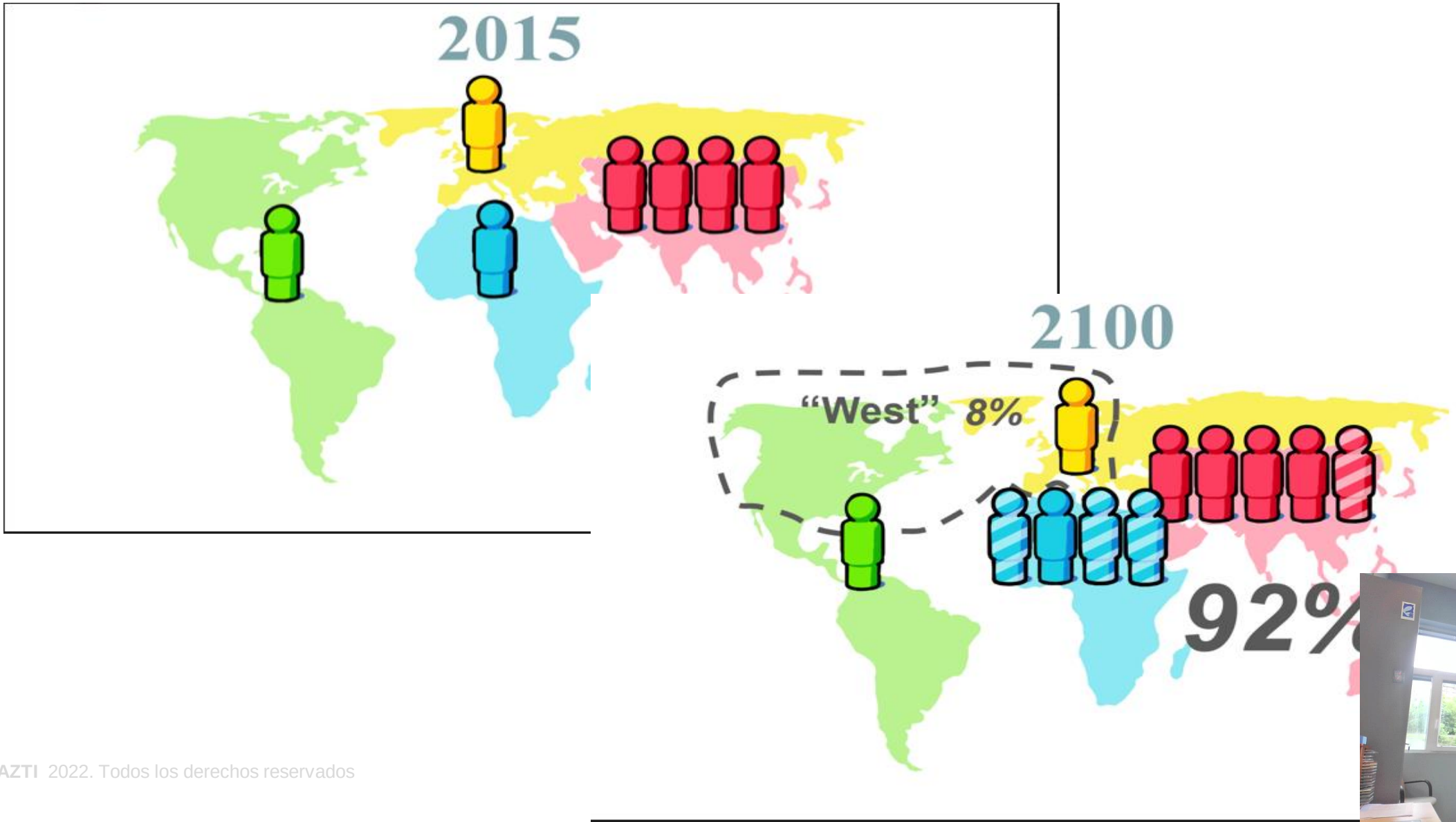
Duarte et al. (2009)

lunes, 14 noviembre 2011

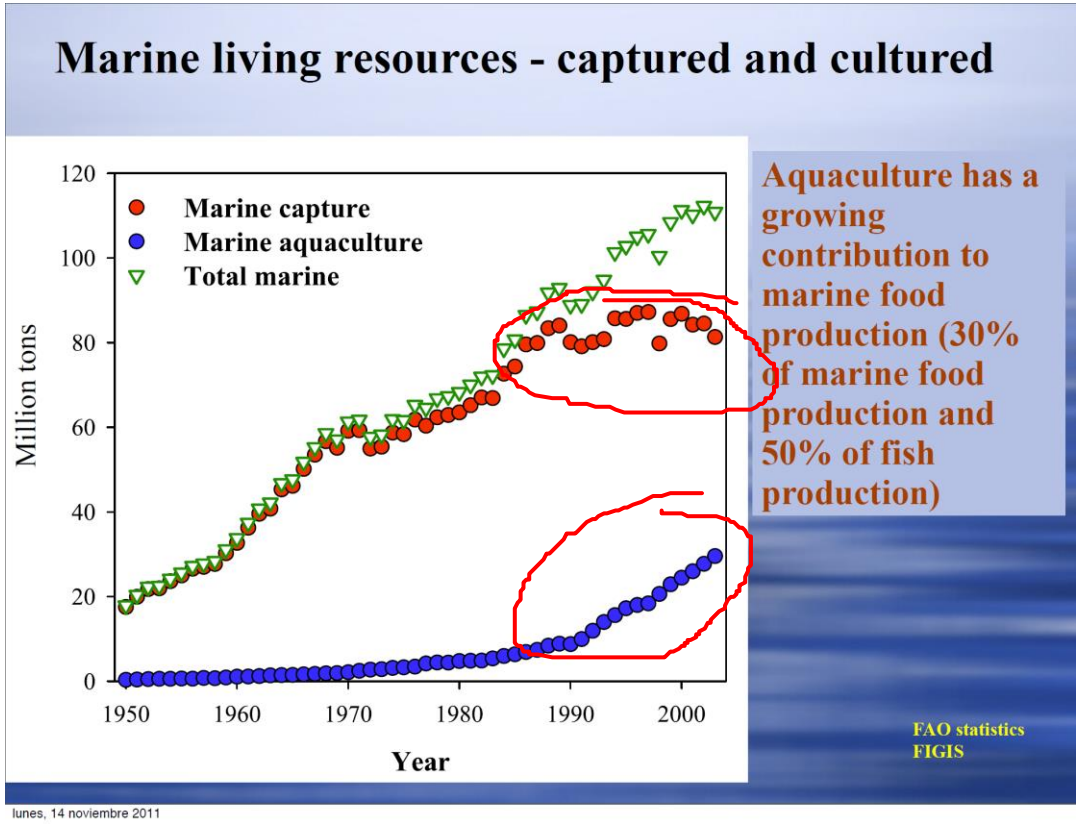
Ejemplos soluciones…

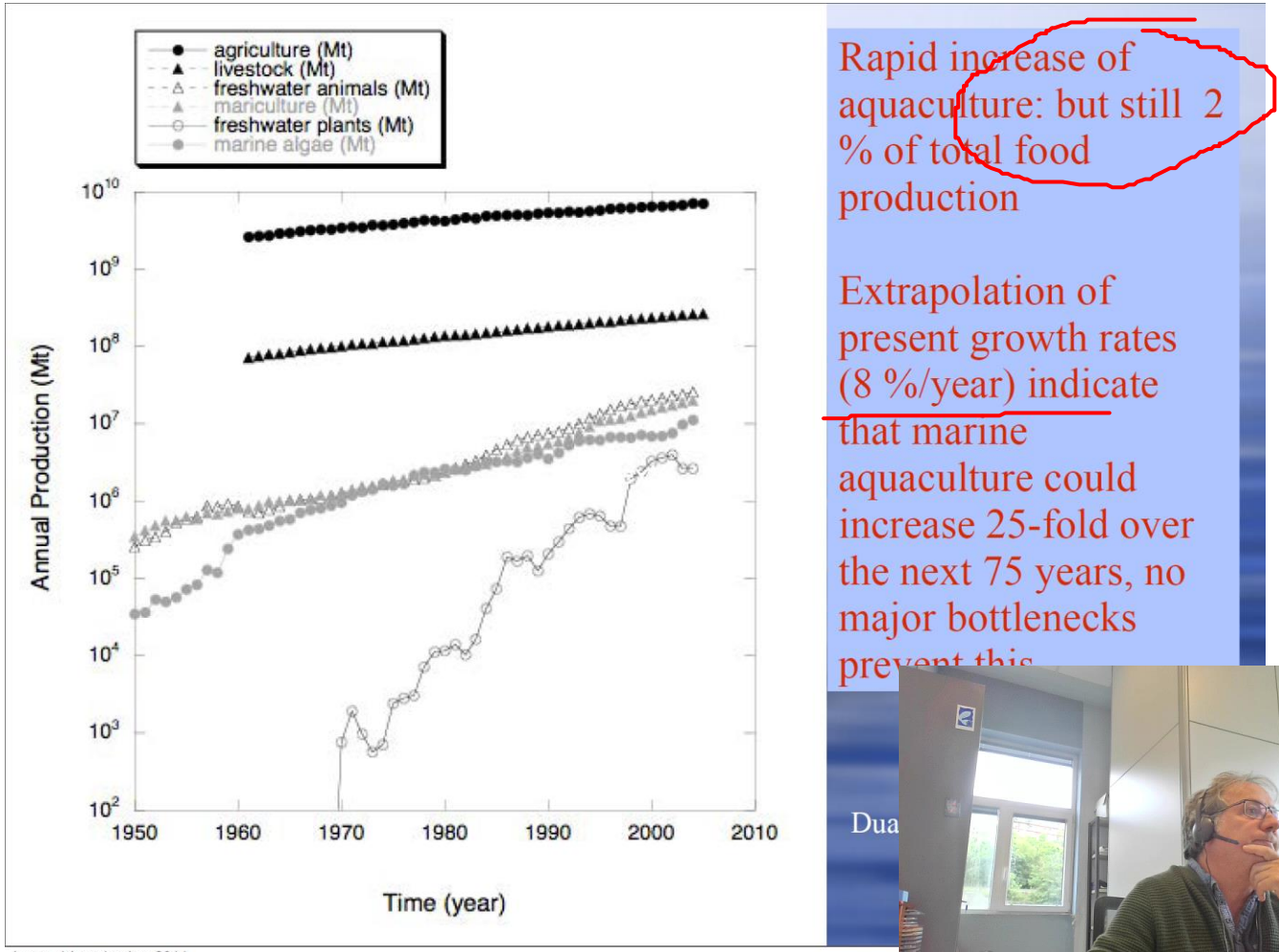


Ejemplos soluciones… ¿los 11000 millones donde?



Ejemplos soluciones…





Ejemplos soluciones…

Acuicultura marina peces carnívoros (Salmones) = criando leones

Limitaciones actuales:

- Espacio
- Pienso
- Impacto
- Enfermedades

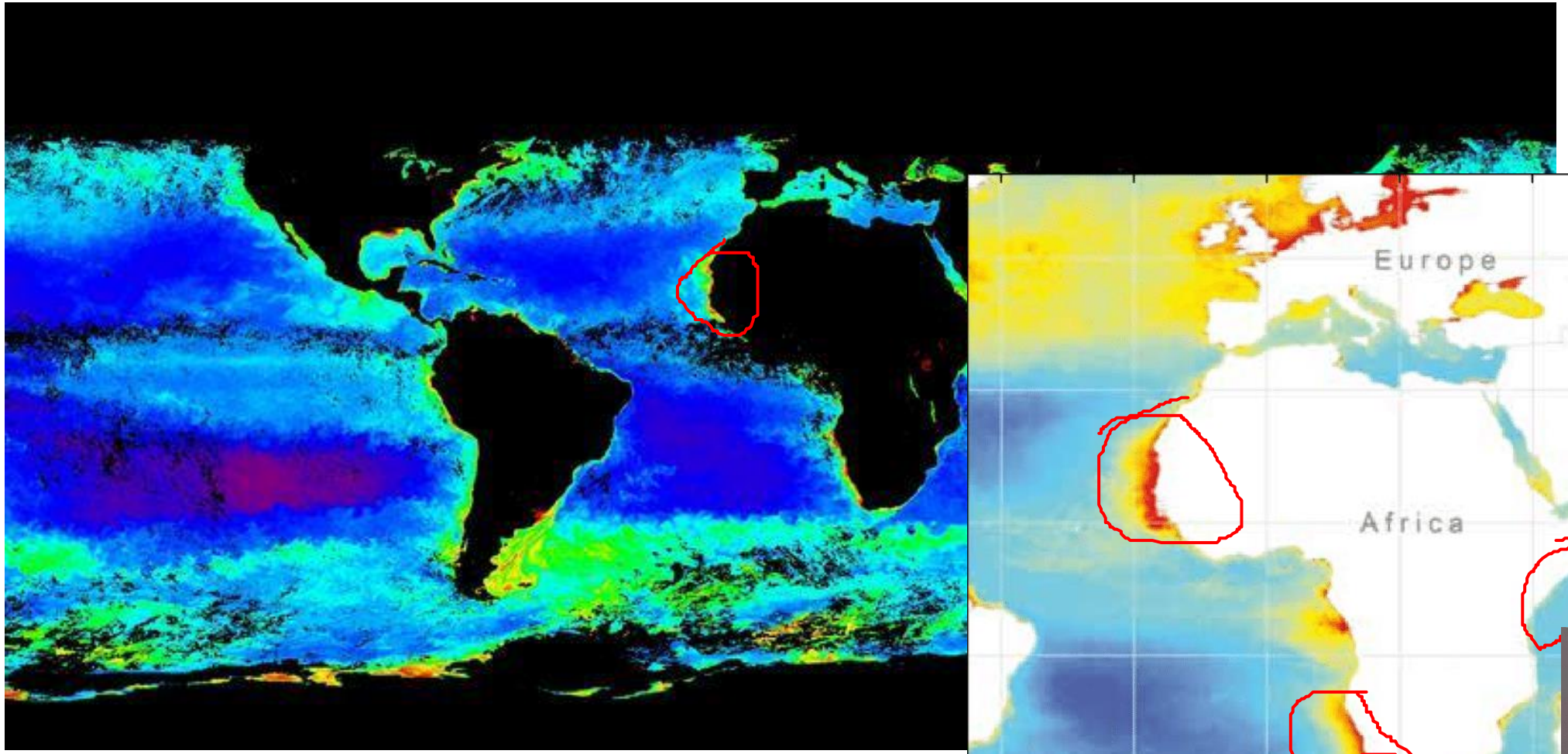
Vamos a hablar de miticultura

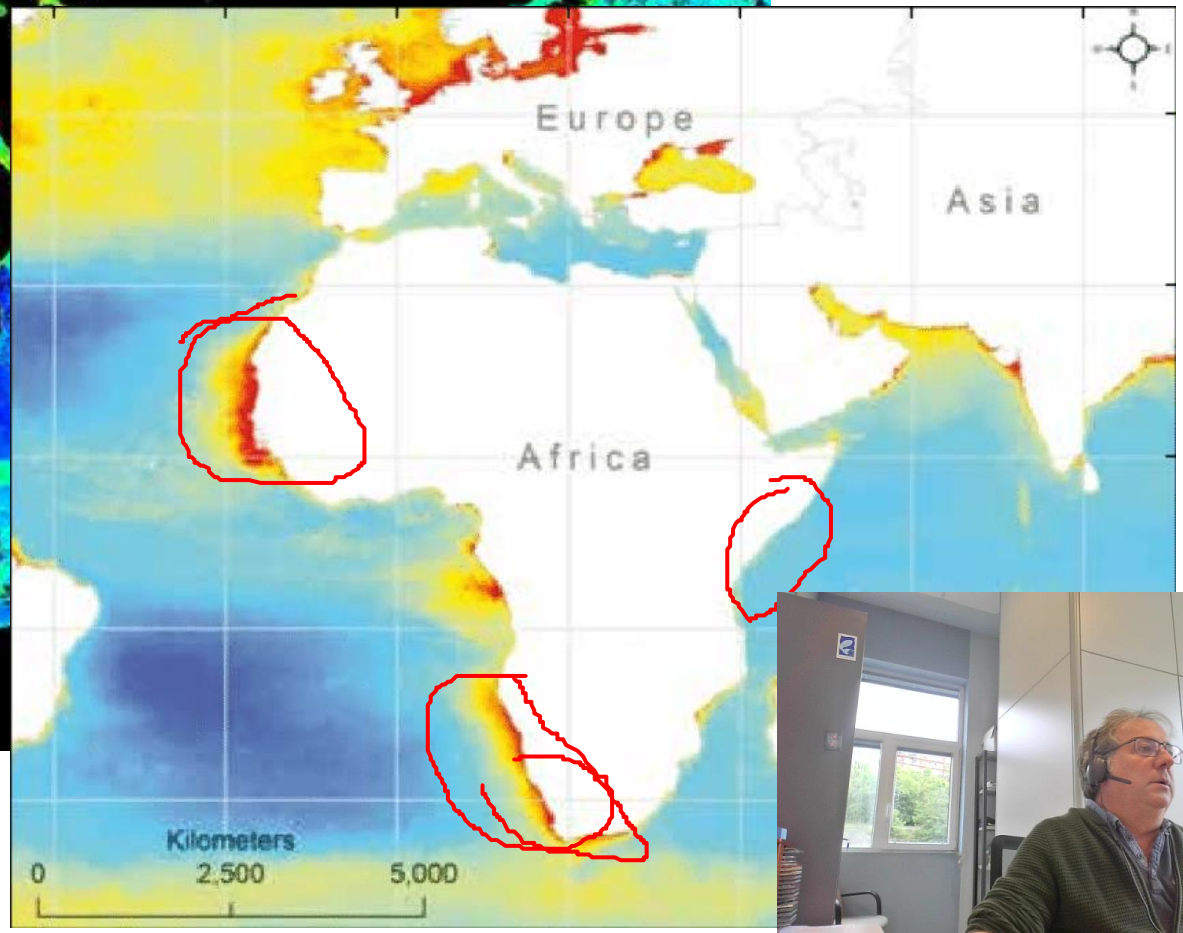
Producción

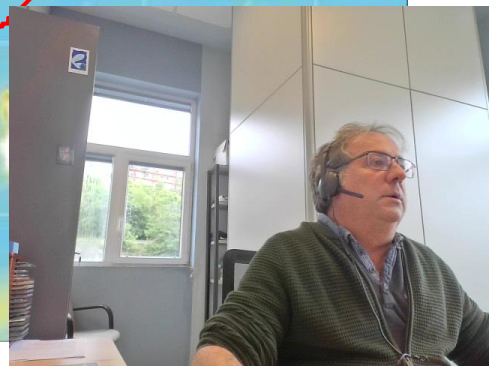
Especies herbívoras filtradoras:

- Sin pienso
- Sin agua dulce
- Bajo impacto
- Espacio disponible
- Enfermedades dependen de la densidad

Acceso







Miticultura: Estabilidad

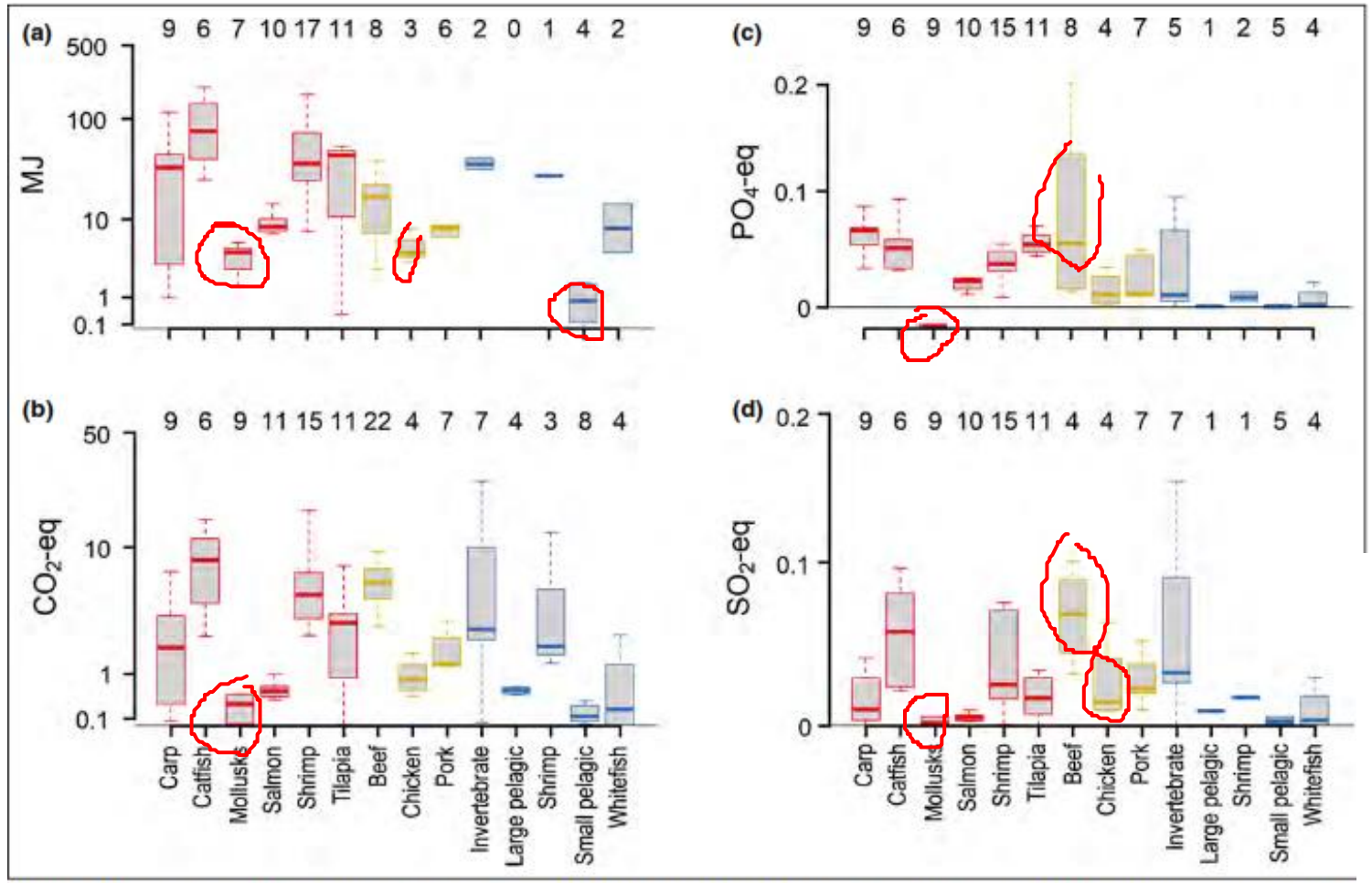


Figure 1. (a) Energy used (MJ), (b) GHG emissions (CO_2-eq), (c) eutrophication potential (PO_4-eq), and (d) acidification potential (SO_2-eq) associated with different production methods per 40-g protein produced. Aquaculture production methods are represented in red, livestock in yellow, and capture fisheries in blue. The thick horizontal line in the box represents the median impact; the box bounds the interquartile range (IQR); and the whiskers extend to include all data within 1.5 times the IQR. Outlier data points are not shown. Numbers above each box represent the number of studies included in each product category. Y-axis spacing is in log-modulus scale, but the labels are not.

Table 1. A comparison of protein content and GHG emissions in kgCO_2e per kg of edible product. GHG numbers are extracted from [15,17–19] and protein data are extracted from Australian Food Nutrient data base.

Protein Product	Protein Content per 100 g of Cooked and Edible Product	kg of GHGs per kg of Edible Product
Beef	27.0	19.0–36.7
Lamb	27.5	
Pork	30.6	
Poultry	29.8	
Salmon	29.2	
Eggs	14.1	
Tofu	16.4	
Blue Mussels	16.0	

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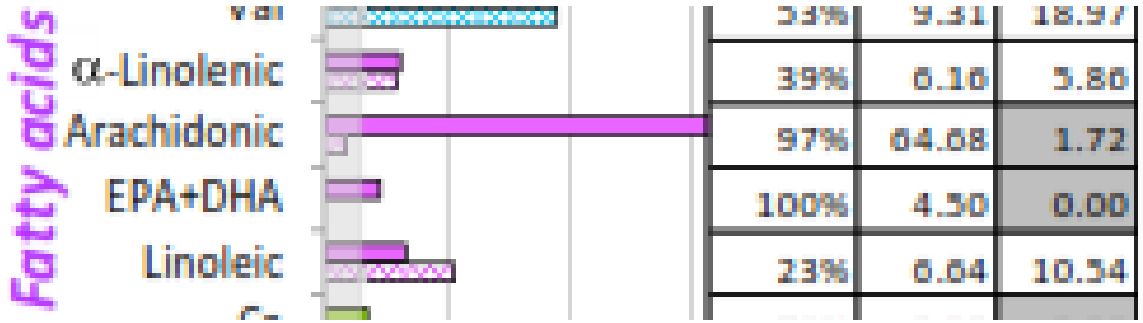
Table 2. Summary of nutrient content and GHG emissions per 100 g of edible portion of mussels, steak, salmon and tofu. Nutrient data are extracted from the Australian Food Nutrient data base and the GHG data are extracted from [15,18,19].

Per 100 g Edible Portion	Blue Mussels, Cooked, No Added Fat	Steak, Fully Trimmed, Cooked, No Added Fat	Salmon, Cooked, No Added Fat	Tofu (Soy Bean Curd), Cooked, No Added Fat
Energy, without fibre (kJ)	438.00	673.00	1202.00	649.00
Protein (g)	16.00	27.00	29.20	16.40
Dietary fibre (g)	0.00	0.00	0.00	4.80
Riboflavin (B2) (mg)	0.07	0.19	0.14	0.09
Niacin (B3) (mg)	0.73	5.14	4.48	0.65
Niacin derived equivalents (mg)	3.77	8.85	11.14	3.83
Dietary folate equivalents (µg)	23.00	0.00	0.00	39.00
Vitamin B6 (mg)	0.08	0.12	0.75	0.12
Vitamin B12 (µg)	20.00	1.00	2.50	0.00
Vitamin C (mg)	5.00	1.00	0.00	0.00
Alpha-tocopherol (mg)	1.00	0.90	5.00	0.00
Vitamin E (mg)	1.05	0.86	4.97	0.00
Calcium (Ca) (mg)	173.00	6.00	10.00	438.00
Iodine (I) (µg)	267.80	1.10	9.80	3.80
Iron (Fe) (mg)	2.97	2.45	1.45	3.97
Magnesium (Mg) (mg)	76.00	27.00	34.00	107.00
Phosphorus (P) (mg)	122.00	246.00	361.00	329.00
Potassium (K) (mg)	131.00	381.00	428.00	178.00
Selenium (Se) (µg)	96.00	10.40	30.30	6.80
Sodium (Na) (mg)	353.00	55.00	57.00	55.00
Zinc (Zn) (mg)	3.12	4.66	0.42	2.33
Cholesterol (mg)	94.00	72.00	90.00	0.00
Total saturated fat (g)	0.37	2.26	3.98	1.32
Total monounsaturated fat (g)	0.20	2.46	7.40	2.24
Total polyunsaturated fat (g)	0.79	0.44	5.66	5.58
Linoleic acid (g)	0.04	0.20	1.56	5.00
Alpha-linolenic acid (g)	0.06	0.06	0.63	0.58
C20:5w3 EPA (mg)	191.33	28.38	1268.27	0.00
C22:5w3 DPA (mg)	21.47	40.09	606.05	0.00
C22:6w3 DHA (mg)	400.87	5.25	1184.51	0.00
Total long chain omega 3 fatty acids (mg)	613.67	73.72	3058.83	0.00
Total trans fatty acids (mg)	46.20	246.33	284.61	0.00
GHG emission (kg CO_2)	0.06	1.90–3.67	0.42–0.54	0.01

Miticultura: Nutrición



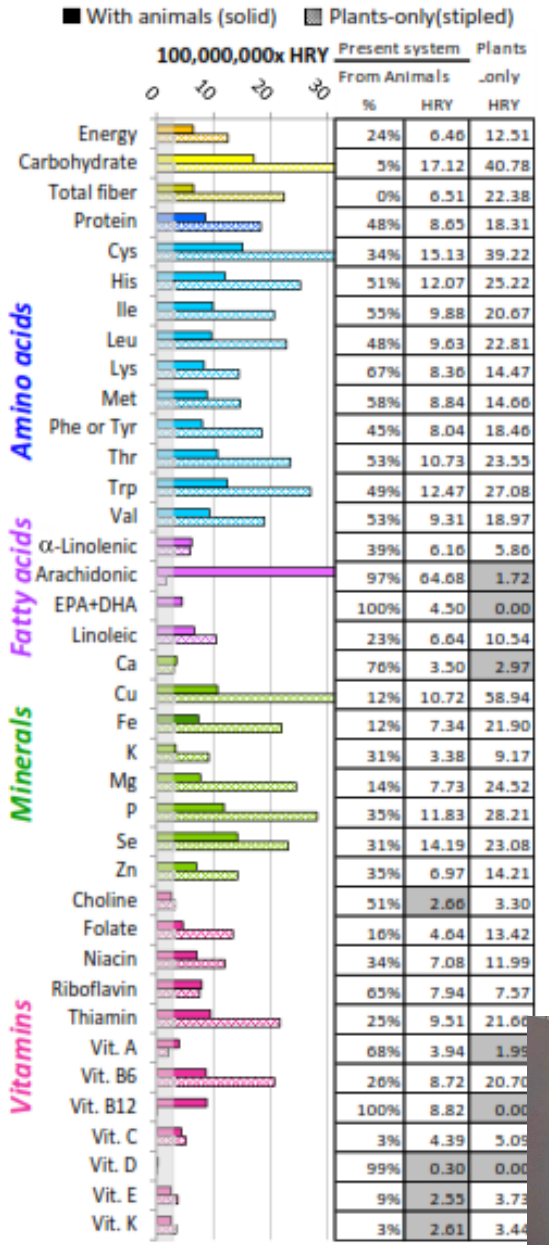


Fig. 2. Total HRYs produced in 2013-based US food production systems wit
actual animal-derived food inputs or modeled without animal-derived foo
inputs (plants-only). The gray vertical rectangle indicates the number of HR
needed to meet requirements of the US population. Grayed boxes indicate HR
production inadequate to meet US population requirements. Energy and pr
tein HRYs required for pets were subtracted from the plants-only diet.

Y sin embargo…

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Miticultura en Europa

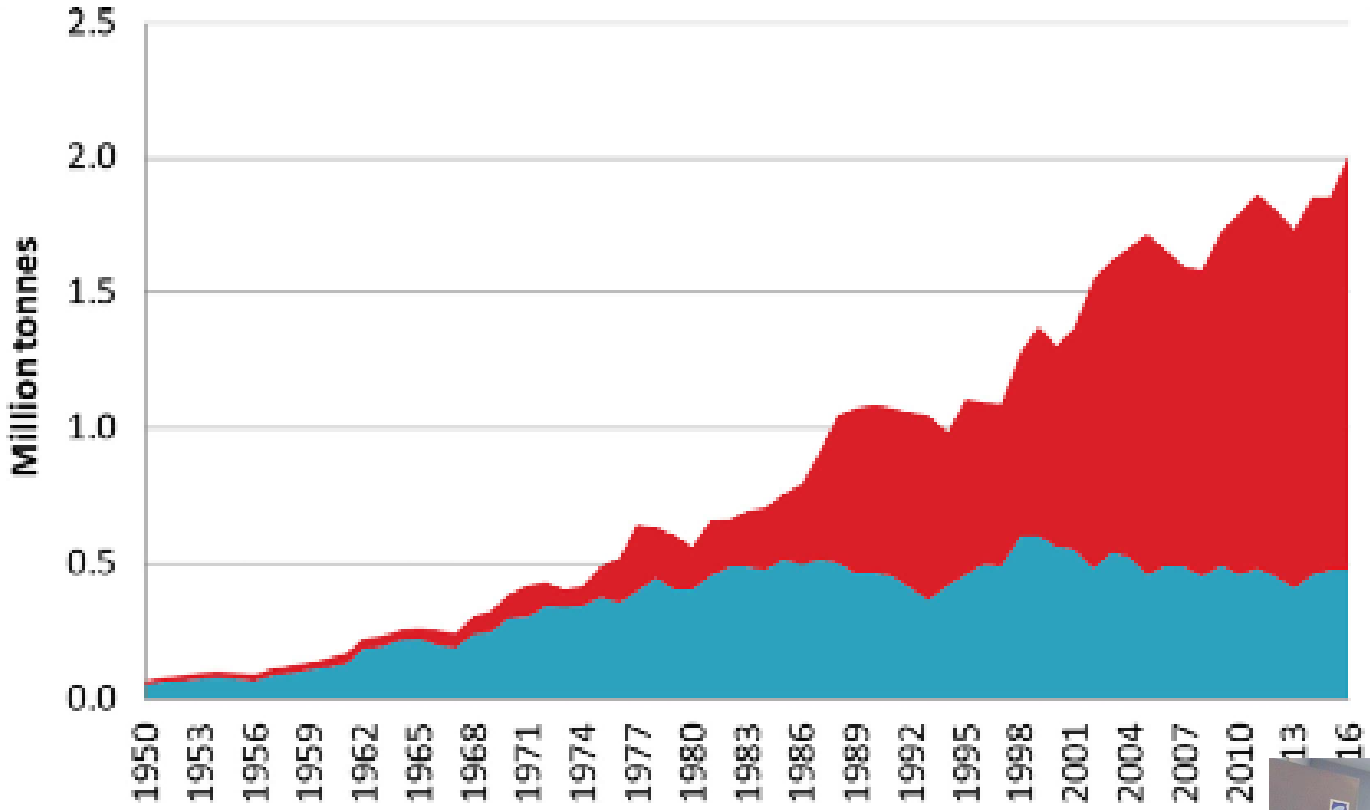
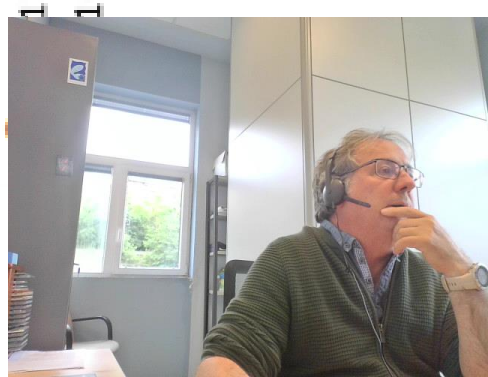


Figure 1 Evolution of mussel aquaculture production by weight (million tonnes) in the EU and the rest of the world (
Source: own elaboration from FAO (2019) data. (■) Q rest of the World; (■) Q EU.



Miticultura en Europa

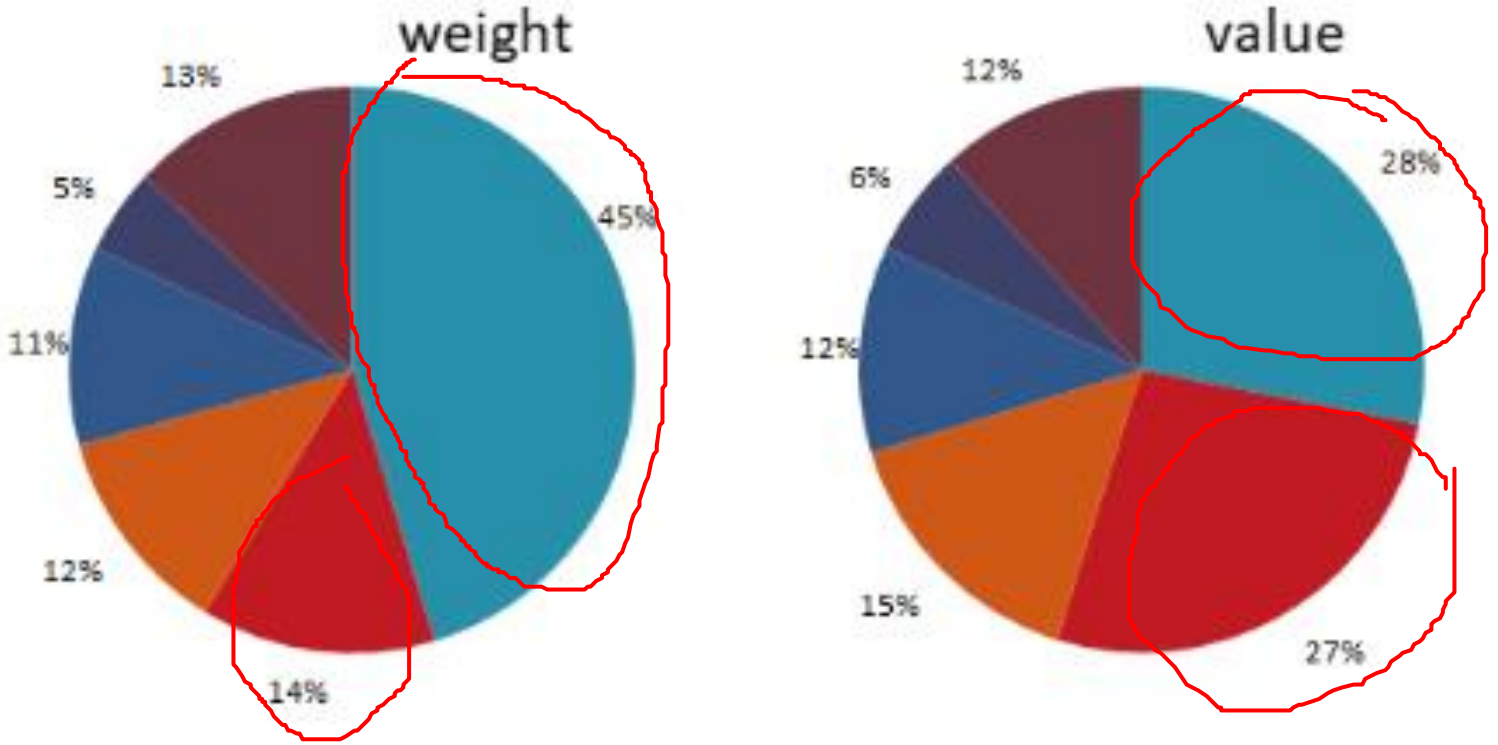


Figure 2 Mussel production by weight and value by EU Member State in 2016.
Source: own elaboration from FAO (2019) data. Weight: (■) Spain; (■) Italy; (■) France; (■) Netherlands; (■) Greece; (■) Others. Value: (■) Spain; (■) Italy; (■) France; (■) Netherlands; (■) Italy; (■) Germany; (■) Others.

Miticultura en Europa

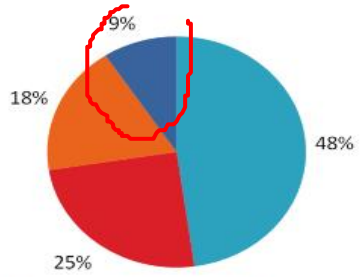


Figure 3 Mussel production in weight in the EU by technique in 2016. Source: own elaboration from STECF (2018) data. (■) Rafts; (■) Long-line; (■) Bottom; (■) Bouchot.

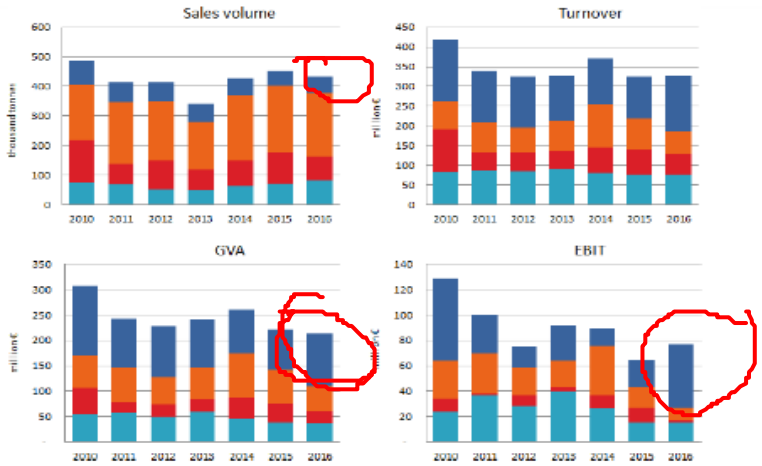


Figure 4 Sales volume, turnover, GVA and EBI
Source: own elaboration from STECF (2018) dat

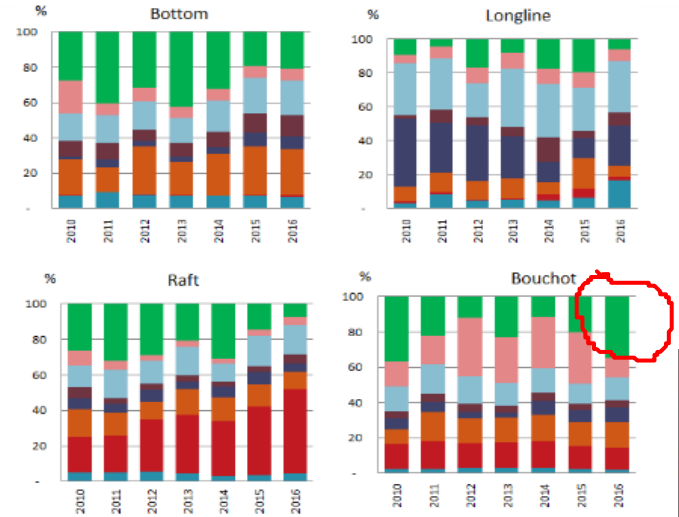


Figure 5 Costs evolution as a share of total income by mussel aquaculture segments for the period 2010–2016.
Source: own elaboration from STECF (2018) data. (■) Profits; (■) Depreciation of capital; (■) Wages and salaries; (■) Repair an
Livestock costs ; (■) Other operational costs; (■) Unpaid labour; (■) Energy costs.

Miticultura en Europa

Miticultura en España

- Estudios en M. Galloprovincialis vs Edulis
- Estudios de producto
  - Nuevos productos
  - Nuevas vías de mercado
  - Imagen del producto
    - Sano
    - Sostenible
    - **DELICATESSEN**

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