

Seafood Strategic Outlook

Winter 2014/15



Food security in UK seafood ANNEXES

An initial review of developments, implications
and practical responses from industry and Seafish

SEAFISH
the authority on seafood



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Contributions have been made from a range
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	Page
Annex 1 UK seafood industry - main systems, functions and activities	3
Annex 2 Food security background	9
Annex 3 Consultation - summary of selected responses	29
Annex 4 Consultees	35
Annex 5 Consultation questions	37





Annex 1

UK seafood industry – main systems, functions and activities

Annex 1 – UK seafood industry – main systems, functions and activities
(Source: Seafish, Defra, 2010)

SYSTEM	BROAD SPECIES GROUPING	SPECIES	SPECIES DISTRIBUTION (AND MAIN PRODUCING COUNTRIES)
Domestic	Whitefish	Cod, haddock, whiting, monkfish, sole, plaice	UK waters/NE Atlantic (UK)
Domestic	Whitefish	Cod, haddock, pollock	UK waters/NE Atlantic (UK)
Domestic	Whitefish	Sole, plaice, rays	UK waters/NE Atlantic (UK)
Domestic	Pelagic	Herring, mackerel, sardine/pilchard, bluewhiting	UK waters/NE Atlantic (UK)
Domestic	Pelagic	Mackerel	UK waters/NE Atlantic (UK)
Domestic	Shellfish	Crabs, lobsters, Nephrops, whelks	UK waters/Eastern Atlantic (UK)
Domestic	Shellfish	Nephrops	UK waters/NE Atlantic (UK)
Domestic	Shellfish	Mussels, scallops	UK waters/Eastern Atlantic (UK)
Domestic	Shellfish	Mussels, oysters	UK waters/NE Atlantic (UK)
Domestic	Salmonids	Atlantic salmon, Rainbow trout (NE Atlantic) small pelagic, waste and some imported fisheries (anchovy, sardine) input as feed in stage 2)	UK waters/NE Atlantic (UK)

	SOURCE METHOD	CAPTURE METHOD	TRANSPORTATION	FORMAT AND PROCESSED FORM
	Capture	Whitefish & flatfish (bottom trawl)	Road, container	Fresh - Whole, fillets/loins, smoked, prepared
	Capture	Whitefish (gillnets) Whitefish (minority line-caught)	Road, container	Fresh - Whole, fillets/loins, smoked, prepared Whole, fillets/loins, smoked, prepared
	Capture	Flatfish & rays (beam trawl)	Road, container	Fresh - Whole, fillets/loins, prepared
	Capture	Small pelagic (purse seine & mid-water trawl)	Road, container	Fresh/frozen (including frozen at sea) - Whole, fillets/loins, smoked, fishmeal, preserved, aqua feed
	Capture	Small pelagic (line caught)	Road, container	Fresh - Whole, fillets/loins, smoked, prepared
	Capture	Crustaceans (pots)	Road, Air freight	Live Fresh/frozen - Whole, prepared
	Capture	Prawn (trawl)	Road	Live Fresh/frozen - Whole, shelled, preserved
	Capture	Molluscs (dredged)	Road, Air freight	Live Fresh/frozen - preserved
	Aquaculture	Molluscs (rope grown/longlines) Molluscs (bottom grown)	Road, container, Air freight	Live Fresh - preserved
	Aquaculture	Marine cage farming Freshwater ponds/raceways	Road, container, Air freight	Fresh/frozen - Whole, fillets/loins, prepared, smoked Fresh/frozen - Fillets/loins smoked, prepared

SYSTEM	BROAD SPECIES GROUPING	SPECIES	SPECIES DISTRIBUTION (AND MAIN PRODUCING COUNTRIES)
International	Whitefish	Cod, hake, halibut, plaice	NE Atlantic/Barents sea (Norway, Russia, Iceland)
International	Whitefish	Alaskan Pollock	North Pacific/Bering sea (USA)
International	Pelagic	Anchovy, sardine/pilchard	Eastern Atlantic (Spain, Morocco) Eastern Pacific (Peru)
International	Pelagic	Tunas (yellowfin, albacore, skipjack, swordfish)	Indian ocean (Spain/France/Sri Lanka) Pacific ocean (Philippines/Mexico) Atlantic ocean (Spain/France/Ghana)
International	Shellfish	Northern/cold water prawn	North Atlantic (Denmark/Greenland/Iceland/Norway/Canada)
International	Salmonids	Pacific salmon	Pacific ocean (USA / Canada / Russia)
International	Cephalopods	Squid, octopus, cuttlefish	Mixed (Eastern Pacific, Mediterranean, North & South Atlantic, Indian ocean)
International	Whitefish	Pangasius	South East Asia (Vietnam)
International	Shellfish	Warm water prawn	South East Asia (Indonesia/India/Thailand), Central America (Ecuador/Honduras)
International	Salmonids	Atlantic salmon	NE Atlantic (Norway/Faroes), Eastern Pacific (Chile)

	SOURCE METHOD	CAPTURE METHOD	TRANSPORTATION	FORMAT AND PROCESSED FORM
	Capture	Demersal fish (bottom trawl)	Road, container, Air freight	Fresh/Frozen - fillets/loins, smoked, prepared
	Capture	Whitefish (pelagic trawl)	Road, container	Frozen - fillets/loins, smoked, prepared
	Capture	Small-pelagics (purse seine)	Road, container	Fishmeal, fish oil, canned, aqua feed
	Capture	Tunas (long line) Tunas (purse seine) Tunas (pole & line / handline)	Air freight, Container	Fresh/frozen - Whole, fillets/loins, preserved Preserved Whole, fillets/loins, preserved
	Capture	Prawn (trawl)	Road, container	Frozen - Whole, shelled, preserved
	Capture	Salmon (nets)	Road, container	Frozen - Whole fillets/loins, smoked, prepared
	Capture	Cephalopods (jigging, trawl in North Atlantic)	Road, container	Frozen - prepared, brined
	Aquaculture	Freshwater pond culture	Road, container	Frozen - Whole, fillets/loins, prepared
	Aquaculture	Shrimp farming (intensive > extensive)	Road, container	Frozen - Whole, shelled, preserved
	Aquaculture	Marine cage farming	Road, container	Frozen - Whole, fillets/loins, prepared, smoked Frozen - Fillets/loins smoked, prepared



Annex 2

Food security background

This Annex provides a general context behind the current concern over *food security*, reviewing some of the more important and general background developments. These developments are economic, social and environmental in nature and concern *globalisation and the development of the global economy, population growth and resource depletion*. These developments are also considered as they relate to seafood.

A2.1 General context and expected food security developments

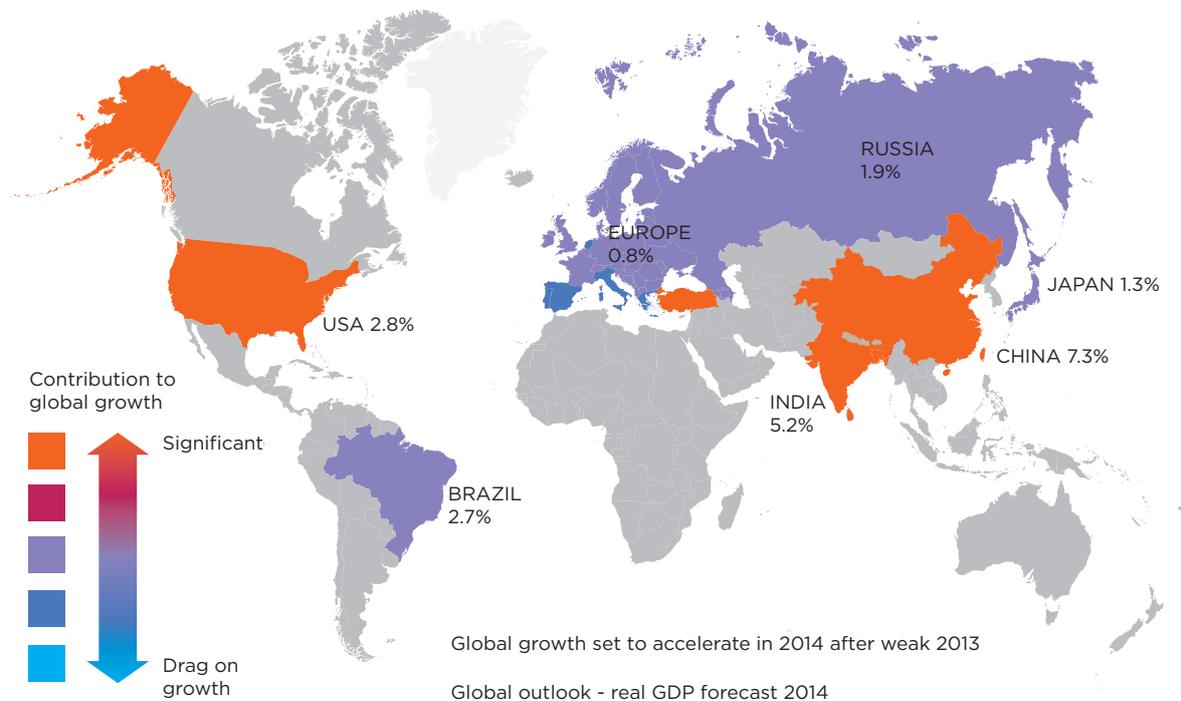
i Globalisation

- Seafood is a globally traded commodity and, as such, global economic conditions provide an important backdrop to seafood trade.
- From the late 1970s to 2008, notwithstanding a series of economic downturns³, there has been a period of global economic growth with sustained efforts to develop a world economy with reduced trade barriers and open markets.

Key developments include the changes in the former communist bloc (including the experience, and subsequent shift away from, central state planning), a general reduction in tariffs and the emergence of free trade blocs facilitated by multilateral entities such as ASEAN, EU, NAFTA and WTO.

- Since 2009, and the aftermath of the severe downturn following the credit crunch, the global economy has seen a gradual recovery albeit with significant downside risks and fragility (FAO, 2014; 47). Much of this recovery is partial with full recovery dependent on the performance of weaker economies (particularly in the EU) and the continued recovery of other higher income countries, and the degree to which growth in China moderates.
- Global trends remain volatile with growth in 2014 appearing to confirm forecasted growth in some countries, for example US and China, whilst confounding forecasts in others, such as Russia (Figure A2.1).

Figure A2.1 Global growth 2014 (Wood MacKenzie, 2013)



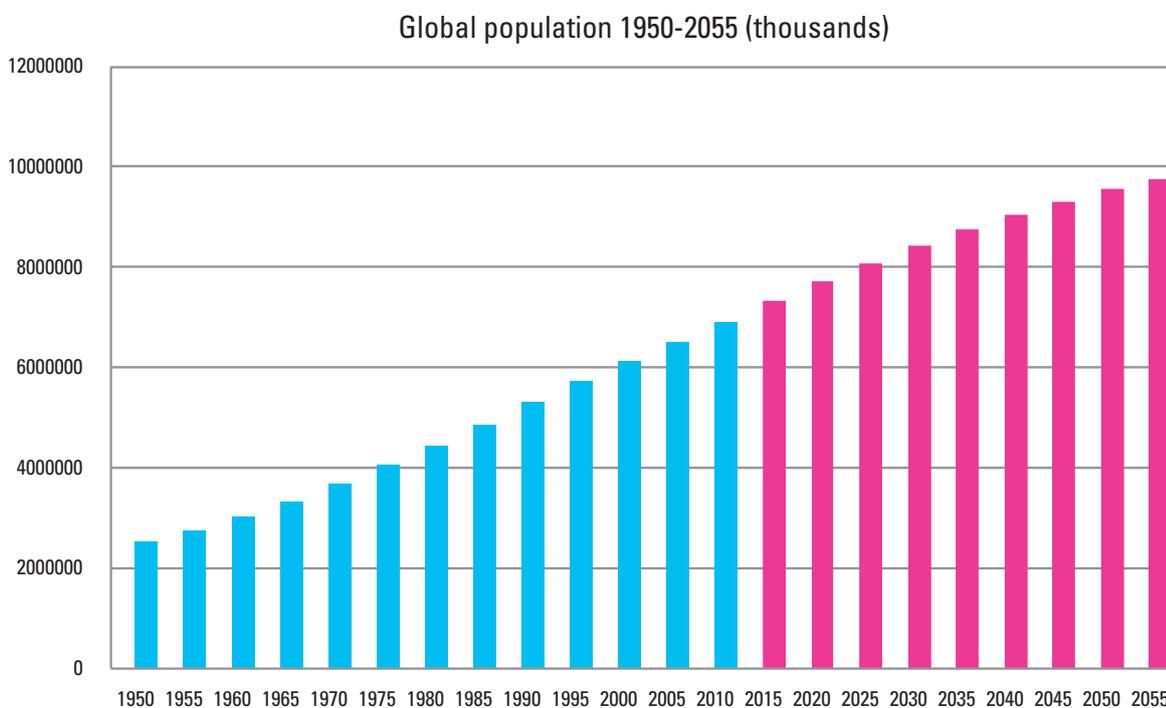
³Notably, the Latin American debt crises in the 1980s and thereafter (including Argentina's debt default in 2002), the Asian financial crisis (1997), and the Global credit crunch (2008).

- It is highly uncertain how markets will develop in the medium term, but there is general acknowledgement that the world economy is rebalancing towards Asia. Growing economic strength outside the established western developed world is being driven by the development of so-called BRIC countries (Brazil, Russia, India, China) with large populations, underdeveloped economies and an openness to global markets/globalisation, alongside MINT countries (Mexico, Indonesia, Nigeria, Turkey) with very positive demographic profiles centred on working age population.
- Projections over the next 20 years (Wood MacKenzie, 2013) suggest the following annual GDP growth:
 - OECD average (2%).
 - US (2.5%), Europe⁴ (1.6%), Japan (0.8%).
 - Brazil (3.3%), Russia (3.2%), India (6.4%), China gradually falling (8% to 5%).
- However this rebalancing pathway is by no means certain. Recent events, for example conflict in Ukraine and Middle East, raise levels of hostility and a potential return to national confrontation (including trade sanctions) that could undermine longer-term global co-operation.

ii Population

- Global population has increased from 2.5bn in 1950 to 6.9bn in 2010, and is expected to stabilise around 9.5bn in 2050 (although reaching a point of 'stabilisation' has recently been challenged⁵). Within this, Asia exceeds the population of all other regions combined accounting for more than half the global population.
- See Figure A2.2.

Figure A2.2 Global population 1950-2055 (UN, 2012)

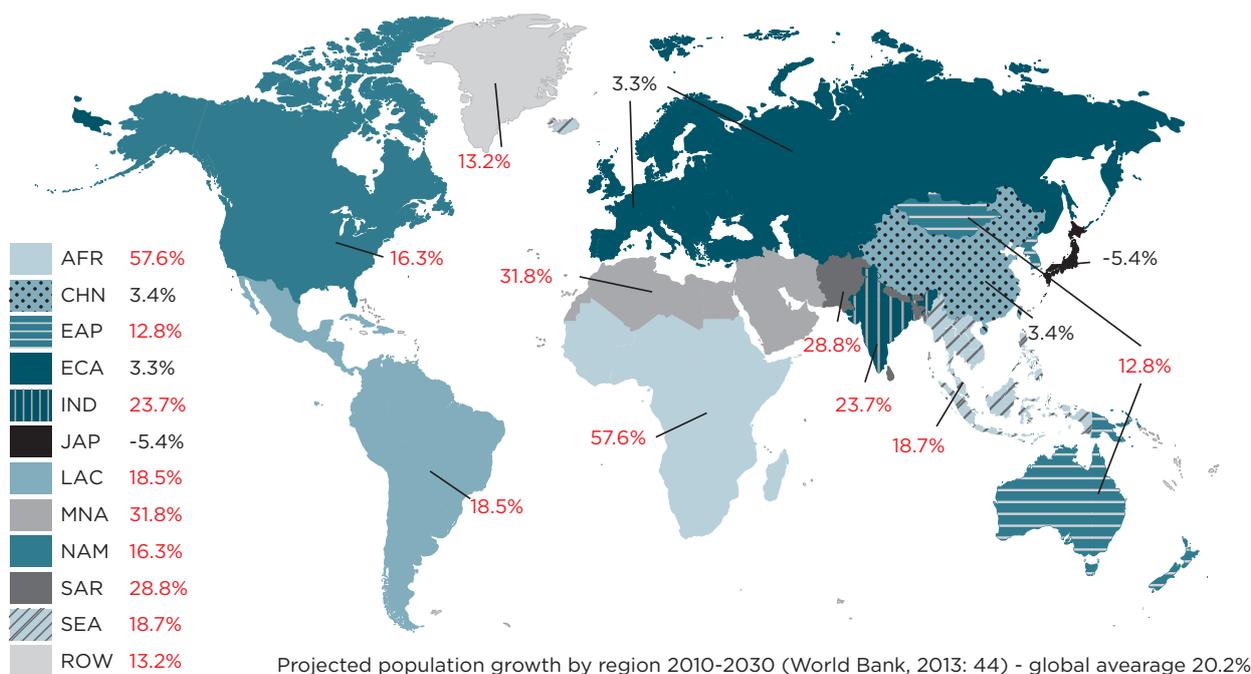


⁴Europe of 40 countries

⁵See Gerlan, P. et al (2014) World population stabilization unlikely this century. Science.

- Although population growth is important, from a *food security* perspective both the working-age and the middle class segments are particularly important. The working-age segment is an indicator of productive activity, whilst the middle class are *pre-disposed to reason and stability (allowing markets to thrive)*, worry less about survival, consume above basic needs, and highlight *the ability to buy* (KPMG, 2012; ADB, 2010).
 - Defining the ‘middle class’ is not straightforward. ‘Middle class’ tends to be a relative term with this group having been variously characterized as those with the greatest political power, greatest mediocrity, highest moral standards or certain level of purchasing power/consumption level. For the Asian Development Bank (Chun, 2010) the middle class in developing countries is considered to be those individuals just above the poverty line, spending \$2-20 per day⁶. This range contrasts with the middle class in developed countries: the upper middle class limit of \$20/day for developing countries is the poverty line for the lower OECD country of Italy (Chun, 2010).
 - Over the last 20 years, some income groups across the world have become more equal with globalization. In terms of real increases in incomes over the period 1998-2008, those spending:
 - o between \$2-\$11/day have been the biggest beneficiaries; and those
 - o between \$11-\$110/day (rich country working classes) did very poorly.
- However, equalisation does not extend to the highest group; those spending over \$110/day did very well over the same period (Donnan, 2014).
- Although the middle classes in developed countries may be squeezed (Leonhardt and Quealy, 2014) the global middle class is not. In fact “*from a global perspective, the middle class is increasing - not shrinking - and boosting growth*” (Tett, 2014).
 - See Figure A2.3 and Table A2.1.

Figure A2.3 Projected population growth by region 2010-2030 (World Bank, 2013: 44)



⁶2005 purchasing power parity \$

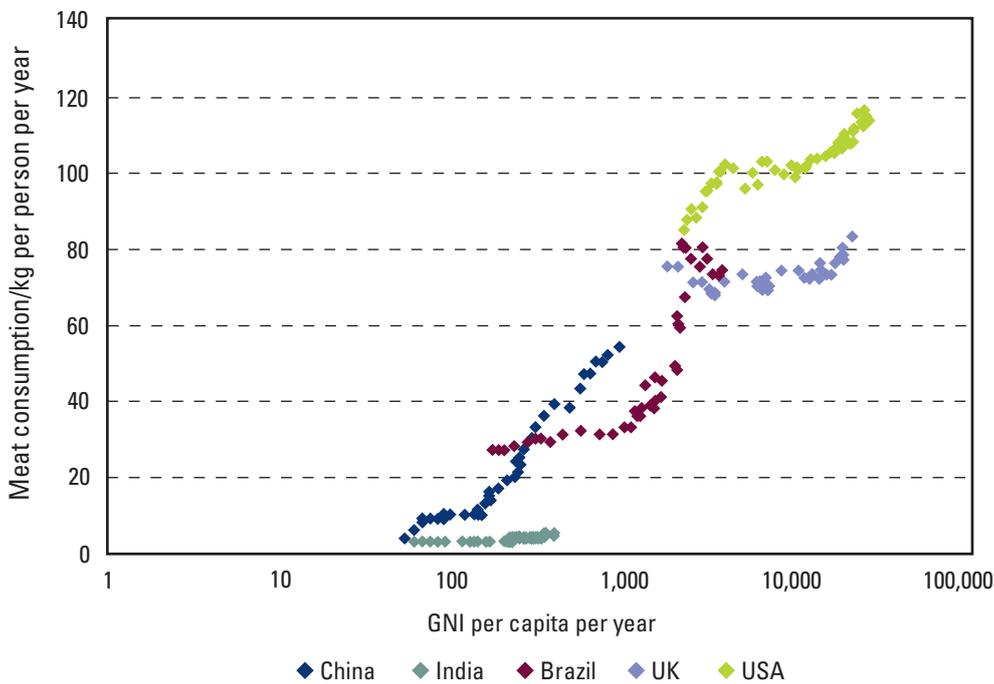
Table A2.1 Summary statistics of population, class size and total expenditure by region 1990, 2008, and 2030 (Chun, 2010)

Summary statistics of population, class size, and total expenditure by region for 1990, 2008 and 2030 (projected) survey means (ADB, 2010)									
Region	Total population (million)	% of population			Total annual expenditure (2005 PPP \$billion)*				
		Poor (<\$2 per person per day)	Middle (\$2-\$20 per person per day)	High (>\$20 per person per day)	Poor (<\$2 per person per day)	Middle (\$2-\$20 per person per day)	High (>\$20 per person per day)	Total	
1990	Developing Asia	2,692	79	21	0	843	721	42	1,605
	Developing Europe	352	12	84	4	23	638	141	802
	Latin America and the Caribbean	353	20	71	9	31	641	480	1,153
	Middle East and North Africa	162	18	80	2	16	247	39	303
	OECD	639	0	24	76	0	735	9,636	10,371
	Sub-Saharan Africa	275	75	24	1	70	109	44	224
	TOTAL	4,473							
2008	Developing Asia	3,384	43	56	1	696	3,285	350	4,331
	Developing Europe	357	2	87	11	4	974	425	1,403
	Latin America and the Caribbean	454	10	77	13	22	1,008	924	1,953
	Middle East and North Africa	213	12	86	3	14	365	66	445
	OECD	685	0	16	84	0	542	12,617	13,159
	Sub-Saharan Africa	394	66	33	1	100	206	69	376
	TOTAL	5,486							
2030	Developing Asia	4,212	20	59	21	436	6,640	25,393	32,469
	Developing Europe	347	1	69	30	3	868	2,100	2,970
	Latin America and the Caribbean	634	7	56	37	19	1,180	5,312	6,512
	Middle East and North Africa	346	16	80	3	22	602	130	754
	OECD	804	0	8	92	0	334	29,801	30,135
	Sub-Saharan Africa	738	45	50	5	126	705	2,033	2,864
	TOTAL	7,081							

*For 2030, Total Annual Income/Expenditures (2005 PPP \$billion), PPP = purchasing power parity. Source: (Chun, 2010: 8, 23)

- However, an expanding global middle class and increased purchasing power is not a certainty:
 - The prospects are positive if purchasing power continues to improve *“It is the growth of consumers that have moved out of the middle class and into the upper class that will really drive consumption and will create a rebalancing of the global economy toward Asia”* (Chun, 2010:23).
 - By 2030, ‘Developing Asia’ will become the foremost consumer globally - \$32 trillion versus OECD \$30 trillion (KPMG, 2012; Chun, 2010).
- However, the global middle class is ‘fragile’ with many people just above the poverty line. Of the middle class defined as \$2-20/day, the largest income group over the past 30 years has been \$2-10/day – a so called ‘fragile’ middle (40% of people in this bracket and a large share being at the lower end). The question is whether the ‘fragile’ middle becomes robust (Donnan, 2014).
- An expanding middle class in Asia will have important consequences for changing tastes and diets (see next section).

Figure A2.4 Changing consumption of meat in relation to gross national income in China, India, Brazil, UK and USA (1961-2007). (Foresight, 2011: Fig 2.3)



Source: FAOSTAT; World Bank

iii Changing tastes and diets - per capita consumption of meat and fish

- The growth of the middle class and purchasing power represents, in dietary terms, a potential increase in per capita protein consumption.
- For nearly 50 years, per capita consumption of meat (kg/person/per year) has been increasing in major developed and developing countries (especially in South East Asia).
- See Figure A2.4.
- In the last 50 years, according to the FAO (FAO, 2014: 62):
 - per capita consumption of fish increased from 9.9kg to 18.9kg in 2010 (ca. 19.2kg in 2012); and
 - global food fish supply has grown steadily at 3.2% (compared to population growth of 1.6%).
- Levels and growth patterns in per capita consumption of fish are uneven geographically (World Bank, 2013: 13, 45). A number of regions with high per capita fish consumption show relatively low growth in consumption (Europe, China, and Japan) and in some cases show a reduction (Japan). Those regions with low per capita fish consumption showing relatively high growth in consumption include India, Middle East/ North Africa and South Asia. The exception is South East Asia, Australasia and North America, which have shown high per capita fish consumption and high consumption growth.
- See Figure A2.5.

Figure A2.5 Growth in per capita fish consumption by region 2000-2006
(World Bank, 2013:13, 45)

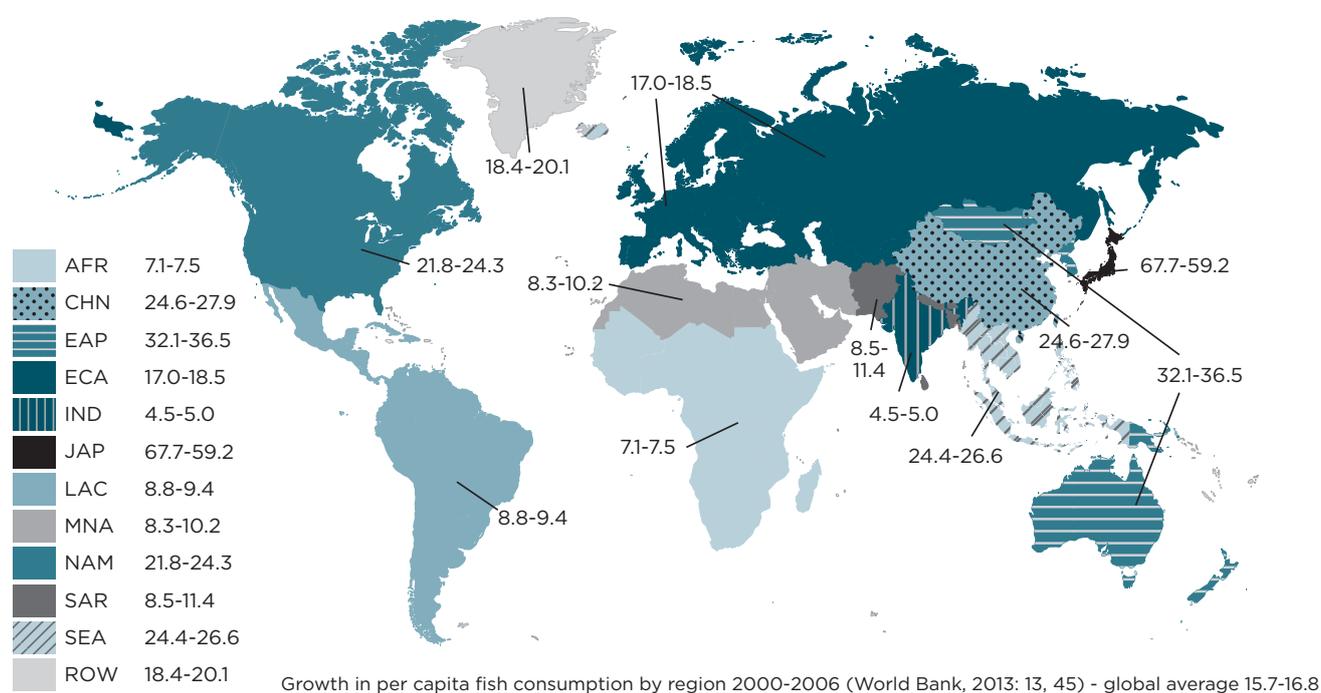


Table A2.2 Growth in per capita fish consumption by region 2000-2006, kg/person/year
(World Bank, 2013: 13, 45)

Abbreviation	Description	2000	2006	% change 2000-2006
AFR	Sub-Saharan Africa	7.1	7.5	6%
CHN	China	24.4	26.6	9%
EAP	East Asia and the Pacific, including Mongolia and developed nations, excluding Southeast Asia, China, and Japan.	32.1	36.5	14%
ECA	Europe and Central Asia, including developed nations	17.0	18.5	9%
IND	India	4.5	5.0	11%
JAP	Japan	67.7	59.2	-13%
LAC	Latin America and Caribbean	8.8	9.4	7%
MNA	Middle East and North Africa	8.3	10.2	23%
NAM	North America (United States and Canada)	21.8	24.3	12%
SAR	South Asia, excluding India	8.5	11.4	34%
SEA	South East Asia	24.6	27.9	13%
ROW	Rest of the world, including Greenland, Iceland, Pacific small island states	18.4	20.1	9%
AVGE		15.7	16.8	7%

- *“World population growth, but more importantly the combination of urbanisation, increased levels of development, living standards and income are key drivers of the increase of fish and seafood demand and of fisheries development.”* (HLPE, 2014 (extract): 2-3).
- Between 2011-2050, per capita consumption of meat is predicted to increase from 37 to 52kg overall and almost double from 26 to 44kg in low-income countries (Foresight, 2011: 51-52)
- According to modelling by the International Food Policy Research Institute (IFPRI), for the World Bank (World Bank, 2013), predictions of per capita fish consumption to 2030 (under a baseline scenario) suggests a number of regions with:
 - o high per capita consumption and high growth in consumption (China, South East Asia and North America);
 - o high per capita consumption and low growth in consumption (East Asia and Pacific, Europe and Central Asia, Japan); and
 - o low per capita consumption and high growth in consumption (India, Latin America).
- See Figure A2.6 and Table A2.3.

Figure A2.6 Growth in per capita fish consumption by region, 2010-2030 (projected) (World Bank, 2013:13,45)

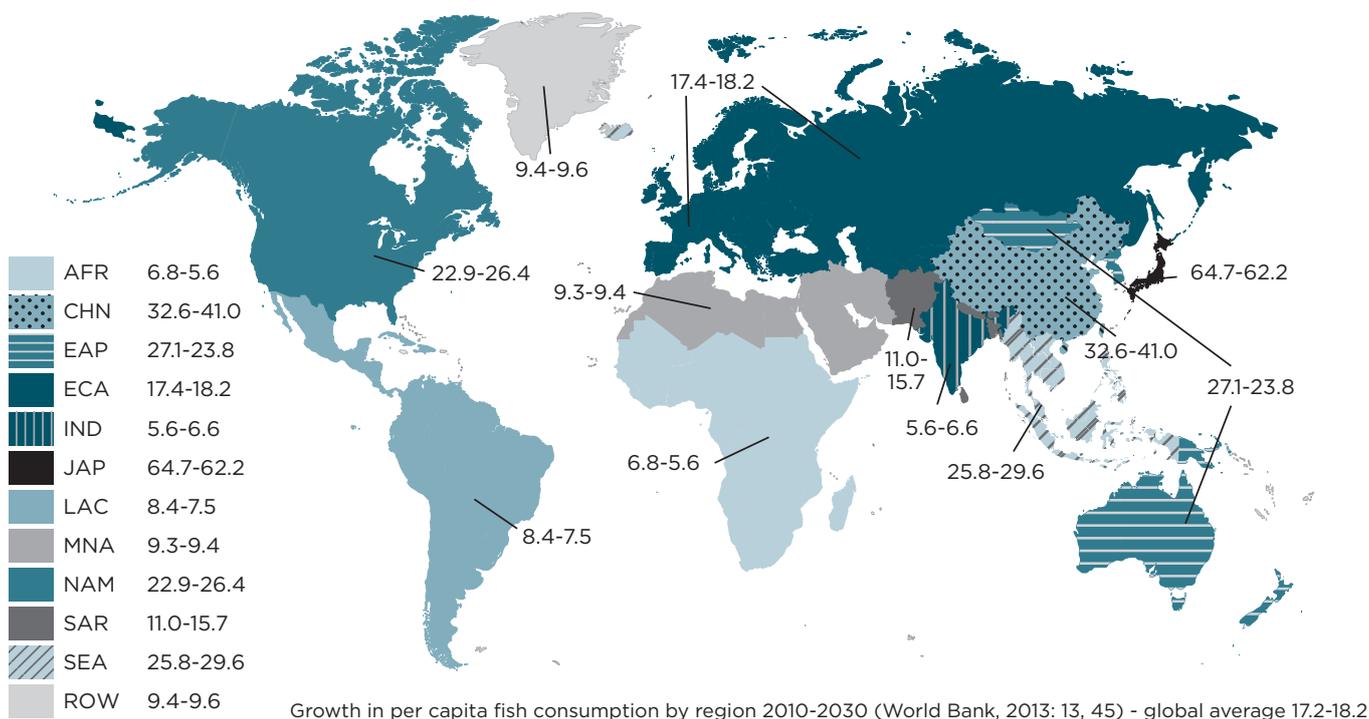
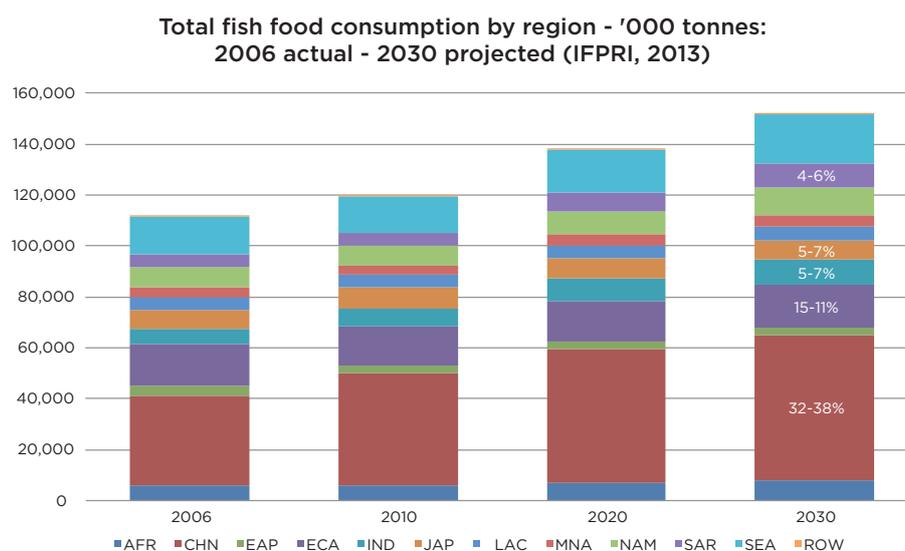


Table A2.3 Growth in per capita fish consumption by region 2010-2030 (projected), kg/person/year (World Bank, 2013: 13, 45)

Abbreviation	Description	2010	2030	% change 2000-2030
AFR	Sub-Saharan Africa	6.8	5.6	-18%
CHN	China	32.6	41.0	26%
EAP	East Asia and the Pacific, including Mongolia and developed nations, excluding Southeast Asia, China, and Japan.	27.1	23.8	-12%
ECA	Europe and Central Asia, including developed nations	17.4	18.2	5%
IND	India	5.6	6.6	18%
JAP	Japan	64.7	62.2	-4%
LAC	Latin America and Caribbean	8.4	7.5	-11%
MNA	Middle East and North Africa	9.3	9.4	1%
NAM	North America (United States and Canada)	22.9	26.4	15%
SAR	South Asia, excluding India	11.0	15.7	43%
SEA	South East Asia	25.8	29.6	15%
ROW	Rest of the world, including Greenland, Iceland, Pacific small island states	9.4	9.6	2%
AVGE		17.2	18.2	6%

- Between 2006 and 2030 the regional share of total food consumption is expected to change. The share of total fish food consumption is expected to increase for China (32-38%), India (5-7%), and South Asia (4-6%) but decrease for Europe and Central Asia (15-11%) and Japan (7-5%).
- See Figure A2.7.

Figure A2.7 Total fish food consumption by region 2006-2030 (World Bank, 2013)

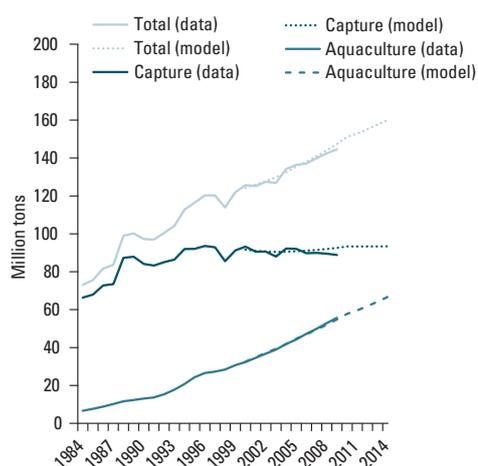


iv Resource availability/depletion

- There are strong environmental reasons to limit significant future expansion of land. In terms of global agriculture, between 1967-2007:
 - o crop yields grew by 115%;
 - o relatively little land brought into agriculture 8% (at expense of forests, savannah, grasslands); and
 - o agricultural area in use per person declined from 1.30 to 0.72 ha per person (Foresight 2011: 55-57).
- This suggests seafood may offer an important contribution to *food security*.
- In the last 20 years seafood production has continued to increase due to sustained wild capture levels and increased aquaculture production. In wild capture the percentage of all stocks fished and overfished has increased 1974-2011, although the latter has stabilised if not decreased slightly.
- See Figure A2.8 and Figure A2.9.

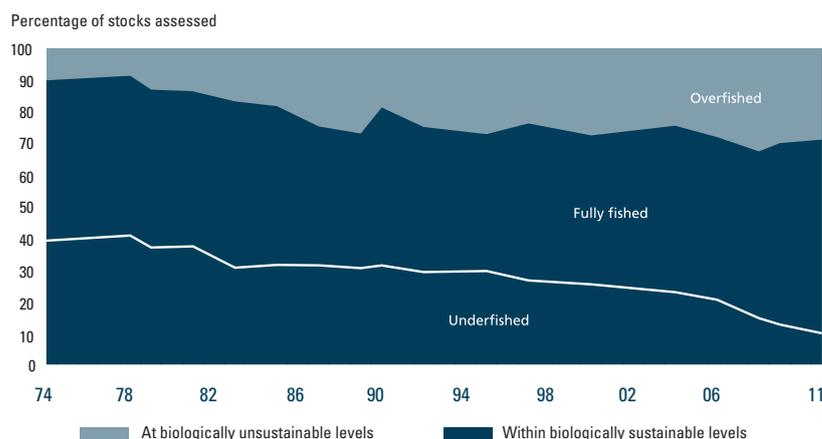
- “Overall, world capture fisheries production has plateaued since the mid-1990s around 90million tonnes per year...in the last three decades, farmed fish production has increased 12 times at an average annual growth of over 8 per cent” (HLPE, 2014 (extract): 2-3).
- The IFPRI model suggests a potential pathway for global fish production to 2030 (World Bank, 2013: 39-40), baseline assumptions suggest:
 - o Global aquaculture continues to increase but at a decelerating rate with zero growth for capture production.
 - o Global fish supply is projected to rise to 187 million tons by 2030 with aquaculture and wild capture making an equal contribution to that supply.
- See Figure A2.10.

Figure A2.8 Global Fish Production: data and projections 1984-2014 (World Bank, 2013: Fig 3.1)



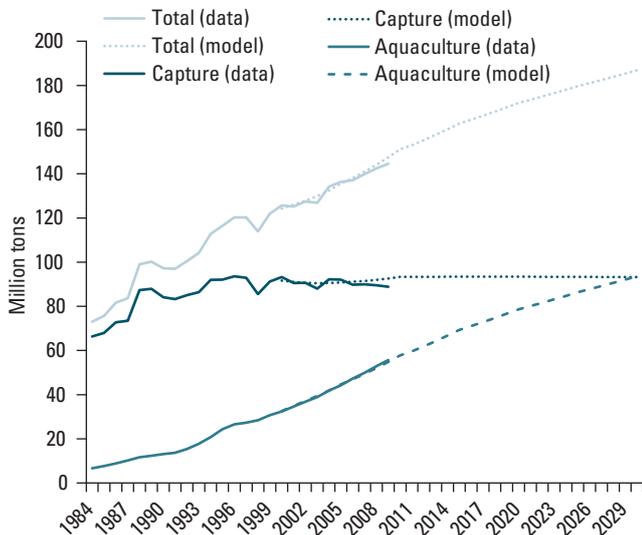
Sources: FishStat and IMPACT model projections.

Figure A2.9 Global trends in the state of world marine fish stocks 1974-2011 (FAO SOFIA, 2014: Fig 13)



Notes: Dark shading = within biologically sustainable levels; light shading = at biologically unsustainable levels. The light line divides the stocks within biologically sustainable levels into two subcategories: fully fished (above the line) and underfished (below the line).

Figure A2.10 Global Fish Production: Data and Projections 1984-2030 (World Bank, 2013: Fig3.1)

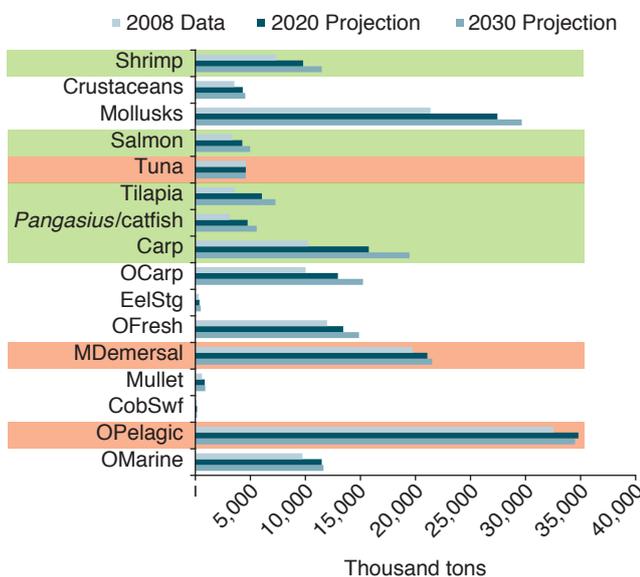


Sources: FishStat and IMPACT model projections.

- The IFPRI model further suggests a concentration of global fish production in Asia towards 2030 (69% of global production particularly in India, South East Asia, and China). In aquaculture South East Asia and India will see greatest expansion. In wild capture, production will remain stable and be more evenly distributed across regions (World Bank, 2013; 40-41).
- The model anticipates that of the global fish supply to 2030, those species amenable to aquaculture production (shrimp, salmon, tilapia, carp and pangasius) are likely to drive growth in supply. Those species with limited aquaculture potential will see only marginal growth in supply, demersal and pelagic – including tunas (World Bank, 2013; 41-42).
- See Figure A2.11.

Figure A2.11 Projected Global Fish Supply by Species, 2008 data, 2020/2030 projected (World Bank, 2013: Figs 3.4, 3.5)

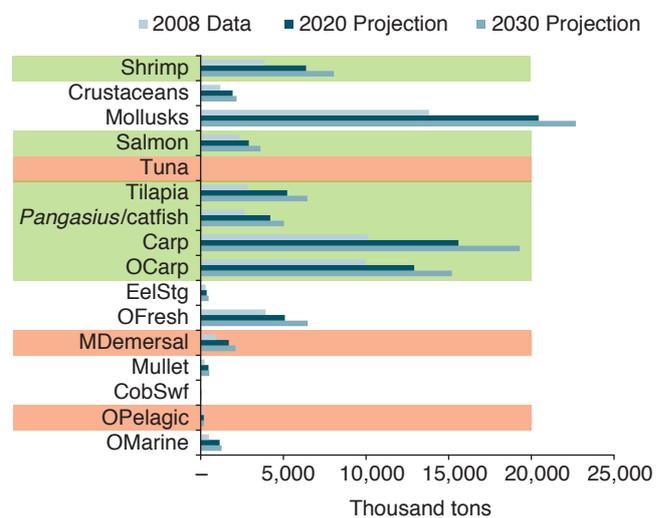
FIGURE 3.4: Projected Global Fish Supply by Species



Sources: FishStat and IMPACT model projections.

Note: Pangasius /catfish = Pangasius and other catfish; OCarp = silver, bighead, and grass carp; EelStg = aggregate of eels and sturgeon; OFresh = freshwater and diadromous species (excluding tilapia, Pangasius /catfish, carp, OCarp, and EelStg); MDemersal = major demersal fish; CobSwf = aggregate of cobia and swordfish; OPelagic = other pelagic species; OMarine = other marine fish.

FIGURE 3.5: Projected Global Aquaculture Fish Supply by Species



Sources: FishStat and IMPACT model projections.

Note: Pangasius /catfish = Pangasius and other catfish; OCarp = silver, bighead, and grass carp; EelStg = aggregate of eels and sturgeon; OFresh = freshwater and diadromous species (excluding tilapia, Pangasius /catfish, carp, OCarp, and EelStg); MDemersal = major demersal fish; CobSwf = aggregate of cobia and swordfish; OPelagic = other pelagic species; OMarine = other marine fish.

v International trade

- International seafood trade developments 2002-2012 reveal accelerating trade growth in the last 10 years (FAO, 2014: 49-51).
- The balance of seafood trade is changing with an increasing share of imports for developing countries, and a decrease in share amongst developed countries:
 - o Importers: China growing at 13% now 3rd largest behind US and Japan.
 - o Exporters: China largest (re-exporting) at 15%, Norway 2nd (Arctic cod) at 9.6%, Thailand 3rd (re-exporting) at 8.1%, 4th Vietnam (Pangasius) at 12%.
 - o Emerging countries have growing importance to exporting countries: Brazil, Mexico, Russia, and Egypt.
 - o EU import dependence growing and developed country trade share declining.
- See Figure A2.12.

- According to IFPRIs baseline assumptions and model, compared with 2006 the projection for 2030 suggests:
 - o Europe’s position as a net importing region is likely to:
 - fall as a share of global imports in molluscs and freshwater and diadromous species (from 1st place to 2nd place) and
 - rise as a share of global imports in demersal fish.
 - o Europe’s position as a net exporting region is likely to:
 - increase as a share of global exports for pelagic species.
- See Figure A2.13.

Figure A2.12 Developed and developing country export and import trade 1992-2012 (FAO, SOFIA, 2014: Fig 19)

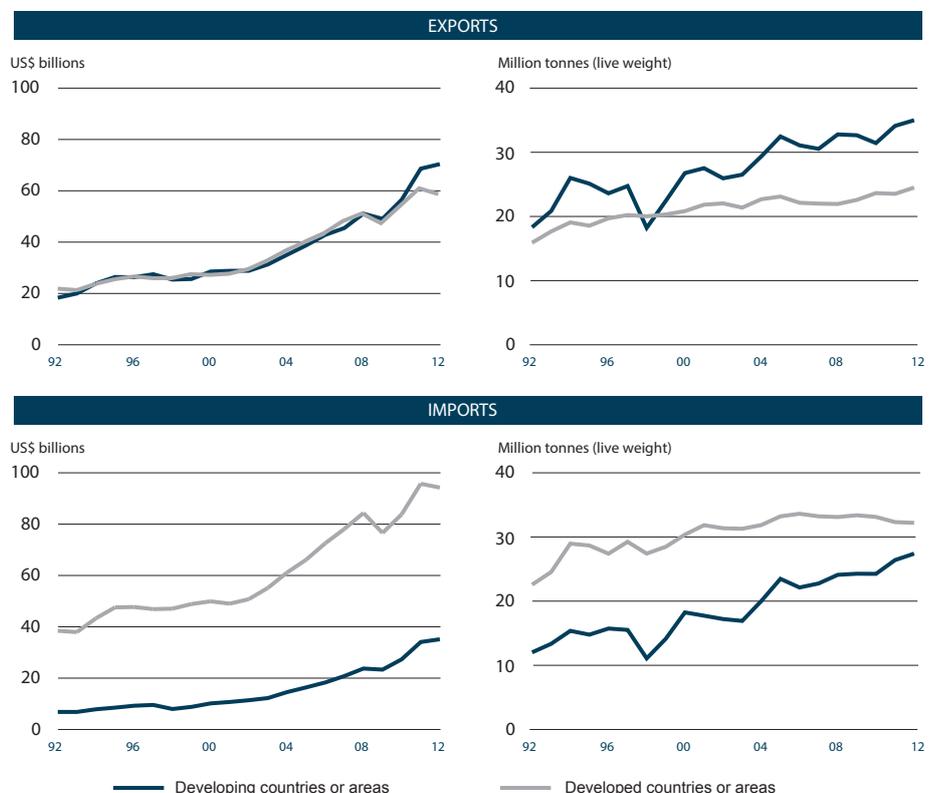


Figure A2.13 Top three net fish importing and exporting regions (2006 data and 2030 projected) – ECA* highlighted (World Bank, 2013 Tables 3.10a and 3.10b)

Projected Top Three Net Fish Importing Regions by Species

	2006 - DATA			2030 - PROJECTION		
	1ST (SHARE)	2ND (SHARE)	3RD (SHARE)	1ST (SHARE)	2ND (SHARE)	3RD (SHARE)
Shrimp	NAM	ECA	JAP	NAM	ECA	JAP
	46%	29%	16%	60%	21%	11%
Crustaceans	JAP	NAM	ECA	JAP	NAM	ECA
	61%	20%	19%	45%	28%	17%
Mollusks	ECA	JAP	NAM	NAM	ECA	SEA
	43%	33%	18%	39%	30%	11%
Salmon	CHN	JAP	NAM	CHN	NAM	JAP
	33%	30%	19%	55%	19%	18%
Tuna	ECA	NAM	JAP	ECA	NAM	JAP
	46%	24%	17%	42%	24%	17%
Freshwater and diadromous	ECA	NAM	JAP	AFR	ECA	NAM
	42%	41%	8%	50%	21%	13%
Demersals	CHN	ECA	EAP	ECA	CHN	JAP
	31%	31%	21%	43%	32%	15%
Pelagics	AFR	SEA	EAP	ROW	CHN	NAM
	45%	28%	14%	34%	24%	23%
Other Marine	JAP	ECA	AFR	JAP	ECA	LAC
	46%	19%	13%	45%	17%	11%

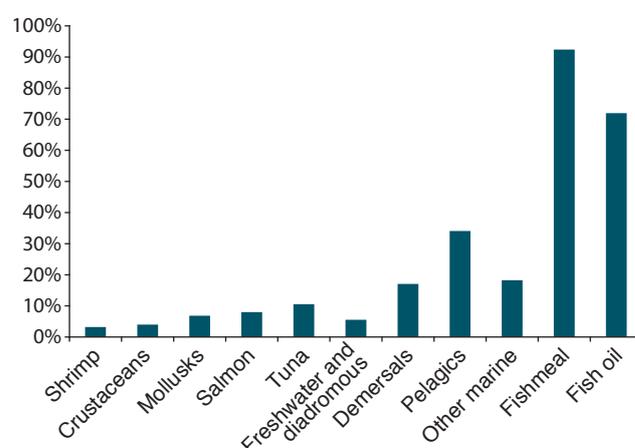
Projected Top Three Net Fish Exporting Regions by Species

	2006 - DATA			2030 - PROJECTION		
	1ST (SHARE)	2ND (SHARE)	3RD (SHARE)	1ST (SHARE)	2ND (SHARE)	3RD (SHARE)
Shrimp	SEA	CHN	LAC	SEA	LAC	CHN
	45%	17%	14%	55%	25%	7%
Crustaceans	CHN	SEA	LAC	CHN	SAR	EAP
	72%	17%	5%	89%	9%	2%
Mollusks	CHN	LAC	SEA	CHN	LAC	EAP
	58%	23%	15%	59%	29%	5%
Salmon	LAC	ECA	ROW	LAC	ECA	ROW
	85%	11%	4%	82%	15%	2%
Tuna	CHN	SEA	ROW	ROW	CHN	EAP
	35%	23%	21%	29%	27%	24%
Freshwater and diadromous	SEA	CHN	AFR	SEA	CHN	IND
	49%	35%	14%	79%	17%	4%
Demersals	ROW	LAC	IND	IND	LAC	SEA
	49%	31%	7%	26%	25%	23%
Pelagics	LAC	NAM	MNA	SEA	ECA	EAP
	34%	17%	17%	56%	16%	11%
Other Marine	CHN	SEA	SAR	CHN	IND	ROW
	69%	20%	8%	70%	27%	3%

Sources: FAO FIPS FBS and IMPACT model projections

- The model projects that overall fish and fish product prices will increase to 2030 but with important differences between species. Most fish species will see modest price increases, however price increases are expected in pelagic and demersal species. The expectation is that material used in fishmeal and fish oil will see price growth increases substantially higher than fish for direct human consumption (World Bank, 2013: 46).
- See Figure A2.14.

Figure A2.14 Projected change in real prices 2010-2030 by commodities (World Bank, 2013: Fig3.6)



Source: IMPACT model projections.

*ECA - Europe and Central Asia, including developed nations.

vi UK domestic/international dependencies

- The UK has long been an importing nation with dependence on both international and domestic trade. This dependency stretches back to the industrial revolution and the exchange of manufactured goods for food and primary material. In contemporary times this exchange of manufactures has extended to services (Defra, 2006).
 - In terms of overall food dependence, the UK is around 60% self-sufficient and in terms of the food types grown in the UK self-sufficiency rises to around 74% (Barling et al, 2008).
 - See Figure A2.15.
 - In seafood trade, there are considerable regional dependencies in major whitefish, pelagic, and shellfish subsystems: North Atlantic, Indian ocean, and South East Asia respectively.
- Example illustration: In the whitefish system, the North Atlantic basin illustrates a major regional interdependency with a considerable amount of regional import/export trade, exposed to *food security* risks. There is a challenge in continuing to meet a regional population’s food needs when the:
 - o Development of this regional trade will be influenced by the increasing pressure exerted with exposure to global trade.
 - o Recent upturn in stocks in the North Atlantic remains relatively low by historical standards, (although many positives can be taken from these increases):
 - recent increases in North Sea cod stocks are relatively low compared to current cod stocks in Icelandic waters and the Barents sea
 - relatively abundant levels of cod in Icelandic waters are below historical levels.
 - See Figure A2.16.

Figure A2.15 UK international trade of fish 2002-2012 (MMO, 2013)

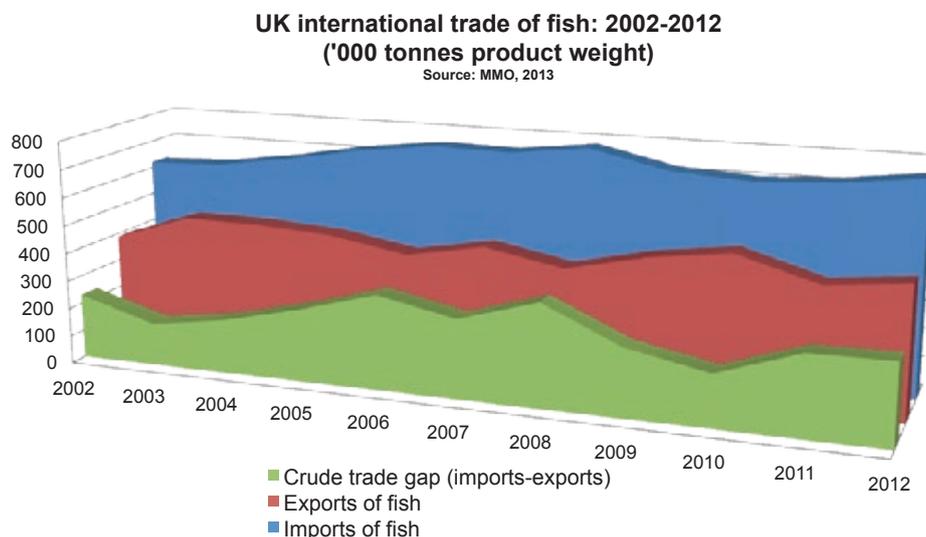


Figure A2.16 Removals, mortality, recruitment and spawning stock biomass of selected North Atlantic stocks over time (ICES, 2014)

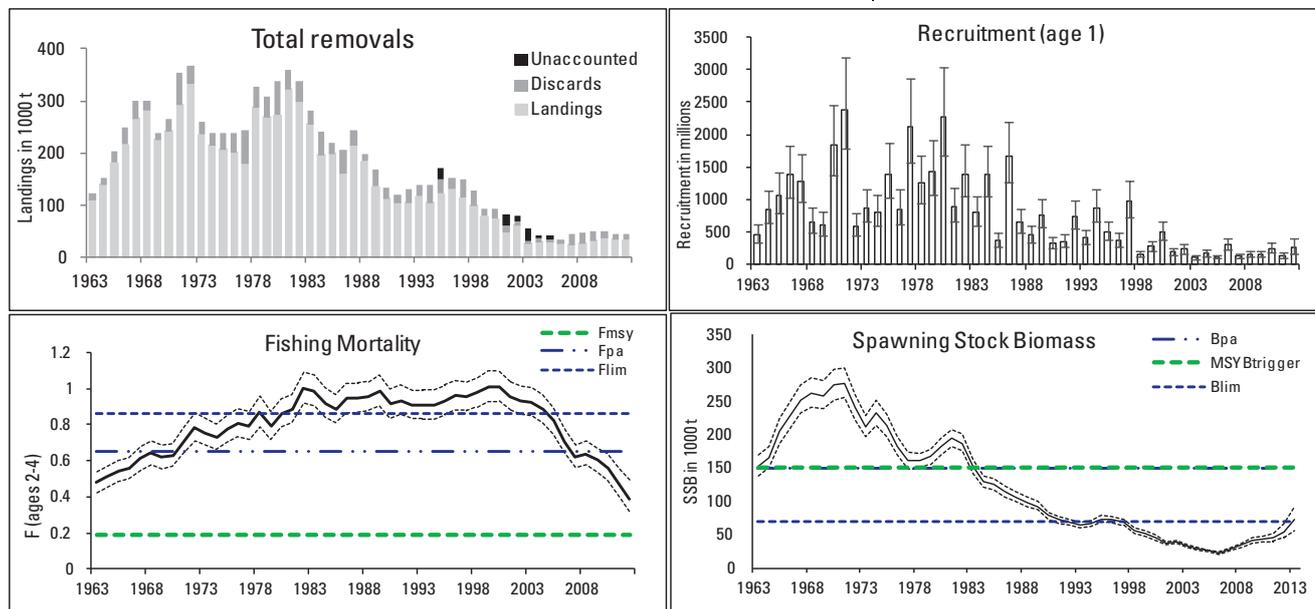


Figure 6.4.3.1 Cod in Subarea IV (North Sea) and Divisions VII d (Eastern Channel) and III a West (Skagerrak). Summary of stock assessment with point-wise 95% confidence intervals, catch estimated, and adjusted for unaccounted removals (from 1993 to 2005).

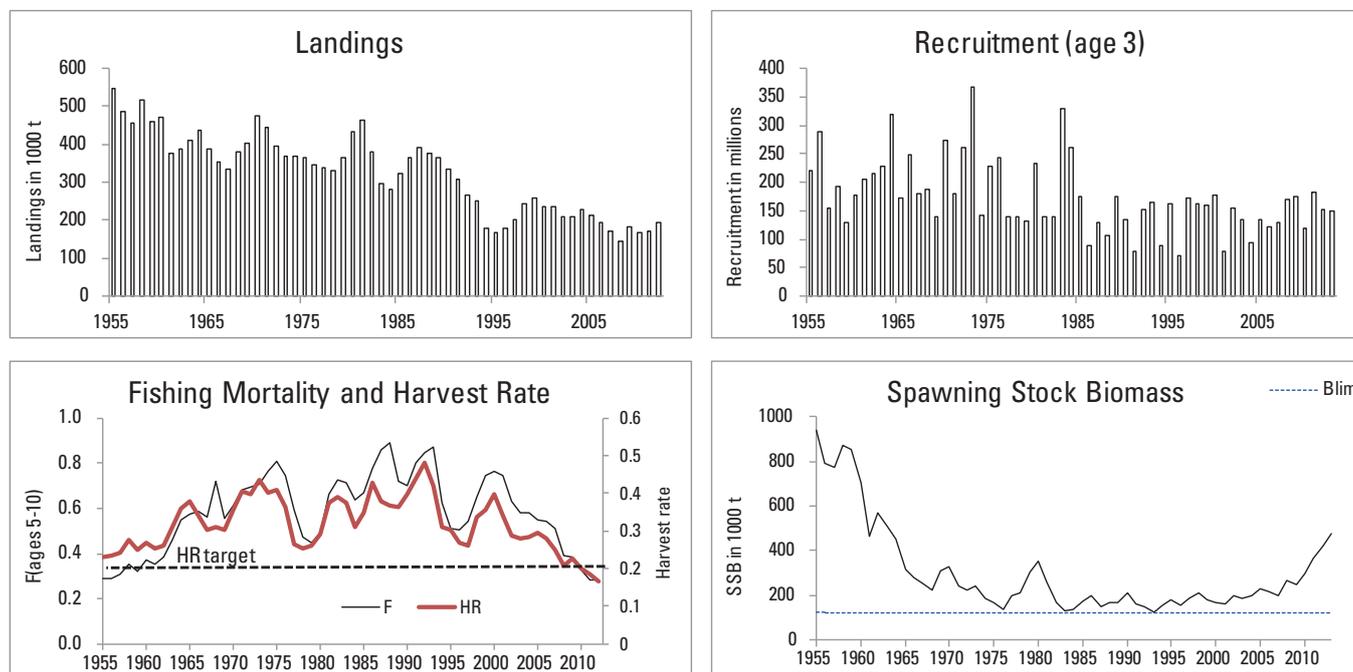


Figure 2.4.4.1 Cod in Division Va (Icelandic cod). Summary of stock assessment (weights in thousand tonnes). Top right: SSB/F for the time-series used in the assessment.

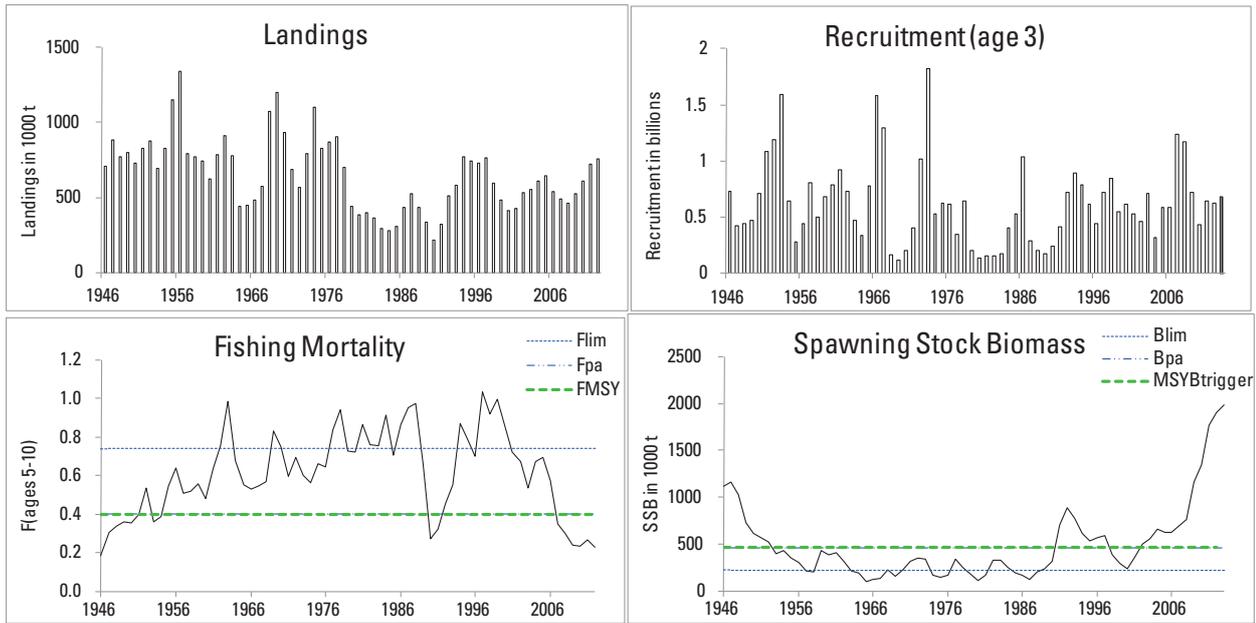
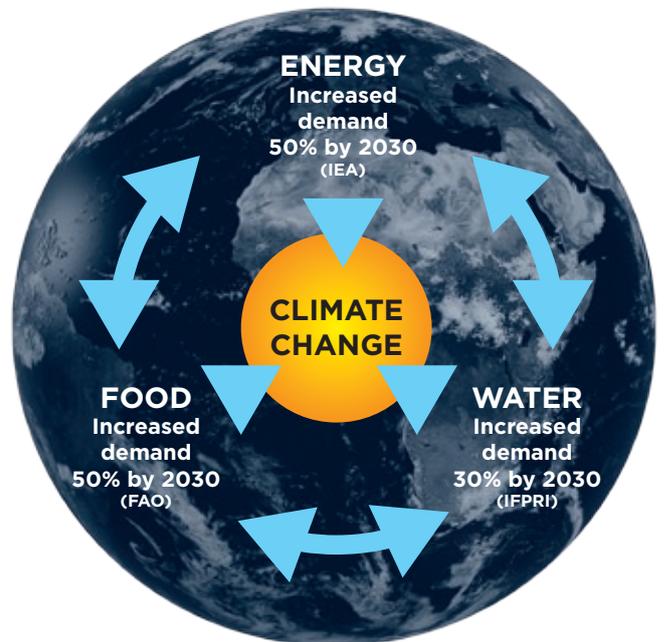


Figure 3.4.2.1 Cod in Subareas I and II. Summary of stock assessment (weights in thousand tonnes). Top right: SSB/F for the time-series used in the assessment.

vii Future scenarios: a perfect storm

- The reliability and resilience of UK food supply needs to be considered in relation to other dependencies at the global level. An important set of dependencies are reflected in the food-water-energy nexus (PwC, 2013: 39).
- As chief scientific adviser to HM government, Sir John Beddington considered the potential for *food security* developments - together with water, energy and climate developments - to threaten a ‘perfect storm’ scenario (Beddington, 2009: 8).
- *“It is predicted that by 2030 the world will need to produce around 50 per cent more food and energy, together with 30 per cent more fresh water, whilst mitigating and adapting to climate change”* (Beddington, 2009: 8).
- See Figure A2.17.

Figure A2.17 Perfect Storm (Beddington, 2009)



- Should such a scenario play out, with major climate change and energy disruption, this could be damaging to future prospects for seafood and therefore *food security*. Given future years are likely to see global price competition becoming much more intense with a reliance on maintaining stable supplies of wild capture production, disruption could have major consequences on securing a pathway of sufficient supplies.

A2.2 Policy positions and initiatives

- *Food security* is not a new phenomenon. In a policy context *food security* has arguably been a point of discussion in the UK since the 19th century Corn Laws, and subsequently with the Agriculture Act of 1947 and the production of the UK Government White Paper *Food from Our Own Resources* in the mid-1970s.
- Various definitions of *food security* have arisen in subsequent debates. Although there are variations, the following is a generally accepted definition:-
 - o *'Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.'* - 1996 World Food Summit.
- There are important aspects of this *food security* concept: macro and micro dimensions, availability of food (supply), access to food (ability to pay/secure), food utilization (ensuring nutrition) and food stability (over time).
- *Food security* policies range from a concern for self-sufficiency to securing supplies from a wide range of food sources. *Food security* concerns at a UK level shape, and are influenced by, *food security* concerns in European and Global contexts.
- In the UK:
 - o The Department for Environment, Food and Rural Affairs (Defra) is the lead department on *food security* policy.
 - o Although the UK is, and has long been, food secure (Defra, 2006), *food security* has moved up the UK policy agenda in recent years. In the UK a declining self-sufficiency ratio (of domestic production to consumption) coupled with the potential for disruption to food supplies due to global uncertainties appear to be activating renewed interest in *food security* (Defra, 2006). Although *food security* has long been an important concern, particularly for developing countries, dramatic food price increases in 2006-08 moved the issue up the policy agenda in developed countries - including the UK (Barling et al, 2008).
 - o As of 2014, the UK Government policy orientation remains one grounded on trade, open markets and diversity of supplies. Although UK policy is supportive of increased domestic food production, *food security* is ensured by being part of world markets that can spread risk and keep prices competitive, rather than self-sufficiency. This orientation can be justified on a number of counts. Firstly this approach spreads risk; with UK food secured from some 30 countries around the world, this allows higher risks in one area to be offset with lower risks in another. Secondly, the UK is one of the world's richest countries (ranked 10th in the world for GDP, and 26th in the world for GDP per capita in 2013⁷) so has strong purchasing power. Finally, the UK is a densely populated country and this renders food production an unlikely source of international competitive advantage (Defra, 2006).

⁷World Bank estimates of Gross domestic product (GDP) and GDP per capita with dollar estimates derived from purchasing power parity (PPP) calculations, 2013.

- o The UK policy position on *food security* is not without criticism. For example, Barling et al (2008) criticise *food security* policy for adopting an overly narrow perspective in its horizons and failing to grasp underlying fundamental drivers generating food insecurities. This narrowness is evident in a focus rooted in the past or near term rather than the future; a marginalizing of other aspects of food such as sustainability; and a failure of *food security* to be adequately integrated to other policy areas. In a wider sense, this concern over short termism is highlighted as a major barrier in dealing with global challenges (Oxford Martin School, 2013).
- o More recently the main threats to UK *food security* are recognised to be from long-term trends in global availability and demand as identified in the Foresight report *The Future of Food and Farming* (Foresight, 2011:165). High level conclusions from this report emphasise that an holistic approach, and a portfolio of actions, is required to address the complex and inter-related nature of the challenges facing food systems. Conclusions highlight that:
 - Substantial changes will be required within food systems.
 - Addressing climate change/ sustainability are dual imperatives.
 - Moves to end hunger must be revitalised (sensitive to low income countries).
 - Policy options should not be closed off.
 - Self-sufficiency is rejected as a viable option for global *food security*.
- o UK monitoring framework
 - In addition to the conclusions above, the Foresight exercise (Foresight, 2011), highlighted the importance of monitoring *food security*. Recommendations include developing metrics, a portfolio approach to deal with the complexity of the issue, and the suggestion that a food system dashboard is developed.
 - *Food security* is currently monitored through the 'UK *Food Security Assessment*'. The assessment looks specifically at the UK, across all foodstuffs and assesses whether there are *food security* issues or not. The assessment was first conducted in 2009 by Defra and the devolved administrations and is expected to be revisited periodically. The last review was in 2012 and the principles were considered to still hold. The assessment includes six themes (with indicators):
 - 'Global availability'.
 - 'Global resource sustainability'.
 - 'UK availability and access'.
 - 'UK food chain resilience'.
 - 'Household *food security*'.
 - 'Safety and confidence'.
- o A number of recent UK initiatives, at various levels and scales, have sought to respond to the *food security* challenge. At a strategic level this includes the UK Strategy for Agricultural Technologies (BIS, 2013) and the Global *Food Security Programme*. The latter is a collaboration of the UK's main public funders of food related research and training seeking to co-ordinate research across Government departments, devolved administrations,

Research Councils and the Technology Strategy Board (*Global Food Security Strategic Plan, 2011-2016*). As a contribution to this programme, a research exercise was recently conducted to identify *the priority research questions for the UK food system* (Ingram et al, 2013).

- o It is noteworthy that UK food policy, monitoring and research have a general focus on agriculture. Wild capture and aquaculture is considered but to a much lesser extent.
- In Europe, there has been an historical focus on self-sufficiency. This was driven by post war food shortages and was reinforced by the introduction of the Common Agricultural Policy (CAP) (that had an objective and incentives associated with ‘certainty of supplies’) as well as financial and geopolitical turmoil in the 1970s. (Defra, 2006). The focus on self-sufficiency revealed a number of shortcomings (e.g. the CAP had led to artificial output prices, producer focus on volume rather than customer demand, and excessive use of inputs) and has weakened in the face of European integration, global trade growth, and agricultural growth around the world (Defra, 2006:15, 45). A similar orientation can be seen in the Common Fisheries Policy (CFP). The CFP is generally focussed on managing who can fish what and how much of a shared resource accessed by member states. In doing so, attention is given to overfishing, industry profitability, fishing communities, markets and aquaculture in an EU context (Engel et al, 2013:19). Although *food security* has been raised in policy-making, and led to some tangible efforts, it would appear that it has yet to become part of the agenda in final policy decision-making (Engel et al, 2013:35).
- At a Global level, *food security* has connotations that range from food disruption to ‘a matter of life and death’. It is unsurprising therefore that the orientation of the UN is on the needs of developing countries, this being a central concern for the FAO (Defra, 2000, 2006). The United Nations Committee on World *Food Security* recently asked the High Level Panel of Experts on *Food Security* and Nutrition (HLPE) to review the role of fisheries and aquaculture in *food security* and nutrition. This review (HLPE, 2014) concluded that:
 - o Fish is a critical food source.
 - o Fish has received limited attention in *food security* and nutrition strategies and was deserving of a more central position.
 - o There were a number of risks and pressures affecting world fisheries, including climate change.
 - o Aquaculture faces both opportunities and challenges, with more effort required in enhancing sustainability and productivity (including the reduction of fish meal and oil in aquaculture and livestock feed).
 - o There were important issues to resolve in terms of small scale/large scale operations, fish trade, social protection, gender equity and governance.





Annex 3

International	
Defining Food Security	<ul style="list-style-type: none"> • Fish is a luxury not a food security issue. • It's about 'not having the right food' (making the right choices and not taking things for granted). • Our ability to provide food for our own needs. • The ability of the world to provide affordable nutritious food available to all. • Concerned with a consistent, reliable, ethical and sustainable food chain for a nation or industry. • Ensuring supplies of food and raw materials, against a backcloth of increased population growth, urbanisation and growing aspirations of certain parts of the population. • The tension between pressures on the factors of production versus changes in demand.
Industry in 10 years	<ul style="list-style-type: none"> • Very populous countries potentially eating more fish. • We may not run out of food but we may run out of choice. • Very bleak if CFP reform doesn't work putting EU fisheries on sustainable footing. • Opportunity for industry to make case for fish as most sustainable protein. • Gadoids return to normality from current outburst, new markets favoured rather than the UK. • Even more regulation (driven partly by scientific advances). • Very much the same but with CFP reforms in place and working.
Opportunities	<ul style="list-style-type: none"> • Fish can play a major part in the food solution (vital to diet and balanced nutrition). • Develop more enlightened attitudes to new technologies (that could help solutions on sourcing raw materials). • Opportunities for fish within wider protein context. • Fish less exposed as a protein (benefits from freezing/waste/water/energy). • Opportunity for quality side of industry in UK preference for cod. • Reassurance of provenance and safety opening/maintaining markets. • Reforms and better fishery management will lead to sustainable stocks / more aquaculture.
Threats	<ul style="list-style-type: none"> • Continuity of supply being lost to buyers in UK as supply price increases / producing nations could become consuming nations and ripple effects on world markets. • Can no longer rely on price to secure supply/complacency means our situation is not good nutritionally. We're not short of food (kind of the opposite really)/legislating ourselves out of global markets. • Loss of trade (banned countries pursue new markets with no incentive to trade with the EU). • Legislating ourselves out of global markets. • Our attitude to containing global warming is one-dimensional (need to reduce as well as adapt to GHG emissions). • Catching sector can have a disproportionate effect on policymaking (political weight out of all proportion to economic weight). • Threat to cheap side of industry in UK cod market – will be replaced by Pangasius. • Criminal/accidental contamination of water supply. • Trawl ban could impact on international resource access. • China and India become net importers and having to hunt for other suppliers.
Action	<ul style="list-style-type: none"> • Processors importing substitutes/switching to export models. • Enlarge the ambition / depletion of resources / ensure consumption not a barrier / whole chain waste. • In wild capture a genuine and general drive for sustainable fisheries including IUU. • In aquaculture, more sustainable sources of feed to meet demand. • We need opinion formers and begin to lead the debate (we've nothing to hide, we care about the planet). • Building supply chains; blood on the carpet for family owned businesses. • Due diligence, traceability and governance. • Educate retailers/consumers to understand more on sustainability and quota management.
Judging success	<ul style="list-style-type: none"> • Highlight a stark picture (By 2025, 95% of domestic food production will be exported, imports will be diminished 50% by higher demand elsewhere, thereby reducing fish to the UK consumer by 50%) and have a graphical projection of per capita reduction within a generation. • Are our current policies (e.g. CFP protecting fishermen and environment the right thing to do, or is it a result of pressure?). • If going to be an opinion former, check out media on food security (how often is this kept in the news?). • Identify international trade metrics, review on an annual basis, publish with interpretation, & commit to a conference every three years. • Combination of public safety and linked to lack of complaints leading to increased profitability. • Can future seafood needs be met given the current demand and level of some stocks?

International/domestic	
Defining Food Security	<ul style="list-style-type: none"> • It's fundamental. It's the ability to provide food for a growing population in a sustainable way. • It's the gap between consumption and production. • Continuity of supply of those species we've highlighted as sustainable. • It's about 'do we have enough food to eat for the future?' and 'is the food I'm buying what I expect to be buying?' • It covers safety (fit to consume) and provenance. • Ensuring people have access to sufficient, safe, nutritious food to maintain a healthy life.
Industry in 10 years	<ul style="list-style-type: none"> • Moving to MSY/implementing CFP (very important to sustainable wild) / Aquaculture increasing to more than 50% share. • Much more sustained availability of wild fish / increased demand for fish from aquaculture / increased fish demand from other countries. • 20 years may be a better timeframe. Have to be more receptive consumers (back to basics) / if prices increase then compete with non-price elements. • More certification (not less) / certain amount of consolidation / doing enough to protect ourselves. • China and India become net importers and we'll have to hunt for other suppliers.
Opportunities	<ul style="list-style-type: none"> • Securing supply chains and investing in supply chain efficiencies. • Influencing consumer trends, securing supplies. • Investment opportunities in aquaculture/good industry players and goodwill. • Value adding existing species, new range.
Threats	<ul style="list-style-type: none"> • Developing countries – coming into aqua and fish production - not having same standards as West/Scottish producers exporting to 3rd countries. • Alternative (not influencing consumers, securing supplies into the future) is not an option. • If we don't invest and do the job properly (we're greedy and without due diligence eg. taking fish from the sea to feed aquaculture and not doing the conversion rate).
Action	<ul style="list-style-type: none"> • Manage the resource efficiently (well managed fisheries and aquaculture), more in the UK. • Industry having a strong voice and take it internationally (including UK practices). • Getting behind responsibility initiatives / need a forum for open discussion (eg a food COBRA).
Judging success	<ul style="list-style-type: none"> • Base success on the definition e.g. look at population dynamic and how this can be supported (see China). • Success would be if, in ten years' time, there was plenty fish to eat and you knew what you were getting and there was enough for the grandchildren. Also that we're having similar discussions, but that we've started to find out some answers with some steps fully implemented e.g. protected zones are working. • Judge success on the priorities set in the first place. Could consider the known volume of the imported product, the potential cost of doing nothing. Did we head it off at the pass (or were we in the spectators' gallery)? How much did we save ourselves (how bad could it have been)?

Domestic	
Defining Food Security	<ul style="list-style-type: none"> • It's about safety/integrity of the product. • Securing food for people to eat at prices they can afford. • Concerns protecting the consumer, food safety, farming in a traceable and sustainable manner, and not below the radar. • It's about having enough food to feed nations worldwide. • It's about 'how do we feed 9 billion' and 'how the UK can contribute to its own requirements'. • It's about maximising the food resource available to society. • It's about serving our own food resources for our own country, but also us feeding world markets that suffer acutely from food insecurity. • Ensuring there's enough food for the population and protecting the material. • Where does my food come from (a sustainable source) and is it safe to eat (is it properly tested).
Industry in 10 years	<ul style="list-style-type: none"> • Could be a possible MSY situation (markedly higher volumes) and market ready to accept it. • We won't run out of food but we'll have to contend with higher food prices. • A more regulated industry, that's not grown significantly. • We may have a leaner, meaner industry (focussing on profit not volume). • A trend towards pelagic size industry for whitefish (although not so small). • Sustainability aspiration is retained / found a way to avoid prolonged disputes. • An improvement but depends on various regulations (MSY, discards ban, MPAs etc). • Protein from the sea will continue but will we have a role in this?
Opportunities	<ul style="list-style-type: none"> • Export opportunities for primary producers selling to BRICs. • There is fish in the sea & quality is our strength. • GM technology could contribute, FS can help industry reputation. • Shellfish production considered very green / farms that can comply will do well. • Wild capture shellfish could be leaner/meaner. • Potential growth in UK scallop market with subsequent growth in export. • Huge profits for those companies wishing to remain in the industry. • Establishing a legal framework for pelagic fisheries to operate within and resolve disputes (taking heat out of the system).
Threats	<ul style="list-style-type: none"> • We don't have enough investment to cope with what's coming/keeping staff. • As East prospers these countries buy up resource / we're fixated on preserving fish stocks (must think beyond this) / will we have an industry to harvest MSY? / aquaculture undermined (as discards going to fishmeal are reduced). • New regulations and competing sectors knock out aquaculture production of shellfish. • UK scallop market/industry undermined by NGOs health scares and reputation of industry as pirates pillaging. • Wild capture shellfish threatened by latent effort. • Some companies wishing to stay in the industry will fail/sell up and industry transition is too quick (driven by excessive regulation). • A downturn could lead to a spiral that undermines industry capability quite quickly. • Spatial management issues could cause local impacts concerning resource access. • FS passes out of the hands of Government and into hands of multi-nationals (local ownership undermined) / food still caught but driven by economic basis / discard ban and MSY drive consolidation. • Feast/famine scenarios continue (fishermen and supply chain not working together).
Action	<ul style="list-style-type: none"> • Domestic producers securing exports. • Higher volumes (domestically) need to come in very phased / investment in vessels and processing / national quota pot. • Need to set out what the industry looks like in 20 years and who produces. • Increase production sites, ensure sensible regulation. • Need 'official' engagement (to deal with latent effort etc). • Manage our reputation, ensure trust and confidence in industry (work with NGOs, practices up to scratch). • Business consolidation, closer integration and collaboration. • A framework in which industry can resolve disputes - what are the lessons (e.g. mackerel)? • A whole range of practical measures (selectivity, access rights etc) / PR on low impact of fishing. • Diligence in application of CFP / make sure our eyes are open and see phases coming.
Judging success	<ul style="list-style-type: none"> • We have to keep a handle on food security. We cannot be eating hand to mouth. • We shouldn't assume our food resource will always produce at prices we can afford. • Shellfish growing industry from a base of zero (in 1970) to annual production of 600,000 tonnes of mussels and 3 million oysters in 2012. • If the level of fishery/catch continues this will be a success. If fishing effort increases and catch increases this will be a failure (catch per unit effort call). If fishing is maintained and crab sizes are maintained this will be a failure (min landing size call). • Success will be if, over the next 10 years, the market share of product has increased, confidence in the industry has been maintained, with no food scare whatsoever, and the market is developing and the demand is increasing. • It's about the ability to plan ahead long term, including but beyond fisheries management. It's about onshore, regulations, commitment and investment to stabilise the food system. • This (success) is a difficult one to answer. We have to sit down and describe the indicators ... would need to draw on experts. Set targets/thresholds and if we look to be crossing these then we can take action. • Success would be a more balanced understanding of fish, and its place as food versus conservation, in public discourse and societal perceptions. Alongside this would be greater balance in the technocratic opinion of a smaller group, and this would be manifested in the associated outcomes e.g. regulation. • Optimal economic and social input into the home nation (UK) in terms of maximising the amount of protein from the sea (in the EEZ in which the fish can be caught).

Other	
Defining Food Security	<ul style="list-style-type: none"> • UK food security is UK plc feeding our people and keeping a broad interesting food supply to the UK, Global food security is how to protect 20% population depending on fish. • Concerned with being able to feed ourselves in 30 years and continue to do so sustainably. Not about self-sufficiency. • Means a situation where the whole population, over a given period of time, have guaranteed access to adequate food in terms of supply, price, quality and nutritional value. • It's the ability of society to meet its requirements for food in a consistent fashion. • Availability of food for all, and access to it, and food that meets human nutritional requirements.
Industry in 10 years	<ul style="list-style-type: none"> • A more difficult trading environment for companies in the UK. • Food system will change in terms of where food comes from and in terms of price. • Little change in 10 years (more in 20-25 years) - North Atlantic production stabilises and more severe swings in trade. • More difficult to source from overseas for UK industry / ability to source from EU stocks will be better / first example of a multi-storey fish farm. • Buying power of BRICs outstrips G7 / Some UK companies fall by the wayside / major share of aquaculture products.
Opportunities	<ul style="list-style-type: none"> • Stronger and deeper partnerships (offering more than price e.g. supporting standards)/drive waste agenda/greater opportunities for those that that can secure material. • UK and Northern Europe develop premium capture and aquaculture products so they're even more desirable (to high end consumers in Russia, China, Japan). • Growth of BRIC middle class an opportunity for UK and domestic production (including UK technical support services).
Threats	<ul style="list-style-type: none"> • Companies with unsecured material are exposed. • Basic problems of producing fish from our own waters (e.g. physical changes) / downsides of withdrawing from Europe and CFP. • MSC undermined as buyers elsewhere pay higher prices for material / reducing quality of marine environment / lack of adaptive legislation / UK produces high quality fish (but behind the curve on this). • The acceptability to GM is a big barrier. This technology can be used in microbial cultures to produce Omega 3 and break the link aquaculture has with wild capture Omega 3. • UK importers suffer changes in market price and loss of raw material.
Action	<ul style="list-style-type: none"> • Be aware of climate change and develop responses / changing consumers attitudes to new species. • Industry need to be alert to, and maintain, a watch over FS issues (which could be small). • Improving production efficiencies/improving logistics and distribution to reduce costs / new aquaculture opportunities.
Judging success	<ul style="list-style-type: none"> • This is the killer question – what and how? Maybe, we just don't know yet. • Success depends on whether the 'definition' has been achieved. However, it has to be recognised that although this may not have been achieved we may well be in a position where: the issues are being dealt with; there is an awareness of changes; and a recognition that the rate of change may be accelerating and we have to deal with it. • Success would be the technical capability to increase food production and respond in a timely way that didn't jeopardise sustainability of the system (at food production end). Having transport systems resilient to unforeseen shocks (not entirely reliant on one route (e.g. EU lorry drivers going on strike). Having adequate surveillance of health issues, and means of detecting fraud etc. • Success criteria will be based on definition i.e. does everyone in the population have access to (and is it available), food of sufficient nutritional content to meet their needs.





Annex 4

Consultees

Industry

1.	Bertie Armstrong	Scottish Fishermen's Federation
2.	Trevor Bartlett	Burgons/Blue Seafood Co
3.	Mike Berthet	M&J Seafoods
4.	Stephen Brown	Landauer Seafood
5.	Ally Dingwall	Sainsburys
6.	Ian Gatt	Scottish Pelagic Fishermen's Association
7.	John Hermse	Scallop Association
8.	Andrew Kuyk & Mike Short	Food and Drink Federation
9.	Chris Leftwich	Chief Inspector to the Fishmongers' Company
10.	Iain MacSween	Scottish Fishermens Organisation Ltd
11.	Mike Mitchell	Youngs
12.	Steve Norton	Grimsby Fish Merchants Association Ltd
13.	Mike Park	Scottish White Fish Producers Association Ltd
14.	Stephen Parry	Youngs/Food and Drink Federation Seafood Group
15.	Doug Rennie	Nolans/Scottish Seafood Association
16.	Dale Rodmell	National Federation of Fishermen's Organisations
17.	Simon Rilatt	Espersen
18.	John Rutherford	Frozen at Sea Fillets Association
19.	Peter Stagg	Le Lien
20.	Huw Thomas	Morrisons
21.	Nick Turnbull	Association of Scottish Shellfish Growers Ltd
22.	Brian Young	British Frozen Food Federation
23.	Laky Zervudachi	Direct Seafoods

Other

24.	Neil Auchterlonie	Centre for Environment, Fisheries and Aquaculture Science (Cefas)
25.	Gordon Friend	Department of Environment, Food and Rural Affairs (Defra)
26.	Mike Kaiser	University of Bangor
27.	David Symes	University of Hull
28.	Jimmy Young	University of Stirling
29.	Paul Williams	Seafish



Annex 5

Consultation questions

1. What is your understanding of food security?
2. What is your level of interest in this issue (minor through to major interest)?
3. What is your opinion on food security?
4. Describe/confirm your operating context (scope for sourcing/markets, species, etc)
5. What long-term food security developments are important to you and your business context?
6. How might you see industry in, say, 10 years' time?
7. What are the likely differences from now and what are the major changes?
8. What opportunities and threats do these developments present?
9. What industry action could be taken?
10. What barriers prevent action?
11. What support, information could support industry action?
12. Are there potential case studies that could be produced to illustrate these food security issues?
13. How could such case studies contribute to resolving these food security issues?
14. What is success in food security, and how can it be judged?
15. How can industry (and Seafish) maintain an oversight of these issues as they develop over long periods of time?
16. How can industry (and Seafish) come to a shared understanding of these developments?
17. How can industry agree on priorities relating to these developments?

Notes

Notes



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