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REPORT

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2016

FISHING FOR PROTEINS

How marine fisheries impact on global food security up to 2050.
A global prognosis

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Date: October 2016
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Acknowledgement

WWF would like to thank the following people who were very helpful in providing critical feedback and valuable information in the preparation of this study:

- Rolf Willmann (former fisheries expert with the FAO)
- Edward H. Allison (University of Washington, Seattle)
- Birgit Meade (Agricultural Economist, USA)
- Rashid Sumaila (Fishery Economics Research Unit, University of British Columbia, Vancouver)
- Mark Prein and Anneli Ehlers (Deutsche Gesellschaft für Internationale Zusammenarbeit, GIZ)

Summary of the Study Background

The world's population is growing and caring for it is now placing the earth's natural resources under severe pressure. One of the most pressing questions concerning the future centres on the food security of what will soon be nine billion people: how will we all have enough to eat? Can we change fishing and agriculture in such a way that they will feed us but their negative effects on the environment will remain limited to an absolute minimum? Will we be in a position to resolve distribution issues fairly and peacefully?

According to estimates, global food requirements are set to double in the next 35 years. From a technological perspective, it seems possible that enough food can be produced for up to 10 billion people (Evans 1998). In terms of calories, farmers around the world harvest around one-third more food than is needed to feed the world's population (BMEL 2015). Nevertheless, around a billion people go hungry every day. Their hunger is the result of a distribution problem and is a consequence of poverty and not of the lack of food availability.

Something that is lacking in some regions is needlessly wasted in others: globally, around 30 to 40% of all food along the production and supply chain ends up in the bin (WWF 2015). The possibility of expanding cultivated land for the agricultural production of staple foods seems very unlikely; on the contrary, this option has reached its limits, or has already exceeded them in many areas. Many farming systems generate huge harvests of products like corn, rice, cereals and meat while simultaneously degrading resources such as soil and water.

And what about fish? Fish plays a hugely important role in global food security. It provides more than 3.1 billion people with at least 20% of their animal protein but above all it is an important source of fatty acids and micronutrients (Thilstedt et al. 2016; FAO 2016; Béné et al. 2015). Fish currently supplies 17% of all the protein consumed in the world. This share will continue to grow because the rising income of consumers is accompanied by an increase in demand for high-quality fish (World Bank 2013). In addition to its importance as a source of food, fish is also of great socioeconomic importance: approximately 500 million individuals throughout the world make their living in some shape or form in the fishing industry (FAO 2014).

Yet the state of global fish stocks is cause for concern. Among the scientifically assessed fish stocks, 31% are considered to be overfished and another 58% to be yet fully fished (FAO 2016; Costello et al. 2016). A further increase in fishing pressure could gravely jeopardise the health of the fully fished stocks (FAO 2016).

In WWF's view, the discussion about supplying the world's population with high-quality protein neglects the fact that both food productions systems – the sea and the land – are closely interconnected and in terms of their capacity and natural limits must be viewed as one. Protein-rich soya is used in fish food whereas fish meal and fish oil are in turn part of the animal food of pigs and poultry. Marine catch rates can obviously not be increased, they have in fact been stagnating for almost 30 years. The demand for fish is currently much greater than can be covered by marine fish alone and already today half of all fish in the world is farmed or comes from aquaculture. This branch of the food industry, which has grown hugely over the last 40 years, requires both sea and land (see the box: Aquaculture).

The purpose of fishery management is to safeguard fish resources and ensure their sustainable and environmentally friendly use in the long term. It is the responsibility of policy makers to ensure that this happens. A number of researchers are convinced that this management must be improved significantly to strengthen global food security and prevent the imminent collapse of fish stocks (Pauly et al. 2005; Worm et al. 2006, 2009; Branch 2008; Branch et al. 2010; Allison et al. 2012; Quaas et al. 2016). Such reforms in management could prove very costly in the short term. However, the measures would be ultimately worthwhile if stocks were to reach a healthy size again (Quaas et al. 2012; Sumaila et al. 2012). Consistent, effective fishery management that pursues an ecosystem-based approach, ensures enforcement of the rules, severely restricts illegal fishing and embeds the concept of sustainable management in all fisheries will improve the global fish supply. This is vital in meeting the continuing growth in demand for fish and maintaining marine biodiversity and ecosystem functions (Worm et al. 2009; Froese and Proelss 2010). After all, healthy fish stocks can only live in healthy seas.

In this study, WWF is seeking to find and consolidate answers to three questions:

- » What is the maximum quantity of fish that can be obtained from the seas in 2050 under sustainable conditions?
- » How will fish demand develop globally and regionally up to 2050?
- » How will these projections affect the consumption of fish? For example, do we face the threat of a fish protein gap?

Aquaculture

Growing numbers of people are eating increasing volumes of fish. In order to meet the growing worldwide demand, fish is also farmed. In fact, were it not for the strong expansion in aquaculture seen in recent decades, the demand for fish could not have been met as the yields from global marine fishery have been stagnating for around 30 years. With an average annual growth of 9% since 1970, aquaculture is the fastest growing branch of the global food industry. The Food and Agricultural Organization of the UN (FAO) calculated total aquaculture production of over 90 million tons in 2014. Today, more than half the edible fish consumed in the world is farmed.

However, the enormous growth in the farmed sector is problematic for several reasons. For one thing, aquaculture is overwhelmingly practised in countries that have little or no statutory frameworks for regulating aquaculture or protecting the environment. For another, it causes major marine pollution, if chemicals, food remains, faeces and medications from the open cages reach the rivers and seas.

Feeding predatory fish in breeding facilities requires primarily wild fish; herbivorous fish rely more on agricultural protein. In the past, as a result of the construction of facilities for shrimp farming in the coastal regions of tropical and subtropical countries, valuable habitats like mangrove forests were lost. Their destruction had huge consequences for the operation of coastal ecosystems, coastal protection and fishing.

In this study, we are focusing on the future of fish from the sea. The future of aquaculture is dealt with in a separate report.

Fish in the Diet

The unique combination of high-quality protein and important nutrients makes fish an exceptionally valuable food. For one thing, it is a good source of animal protein – 150 g of fish provides approximately 50 to 60% of an adult's daily

requirements. It also provides fatty acids, vitamins and other vital nutrients like iodine and selenium, which do not exist in this quantity or variety in any other cereal or meat (Beveridge et al. 2013; Kawarazuka and Béné 2011; WOR2 2013). Food diversity and quality are important elements in the fight against hunger and malnutrition. Poverty is correlated with an excessive intake of staple foods like rice, corn and cereals and an insufficient share of proteins, fats and nutrients.

Fish is frequently the only available and affordable source of animal protein in the coastal regions of developing countries. In a worldwide comparison, rather less fish is consumed in poorer countries (approximately 10 kg per capita per year), whereas the per capita consumption of around 22 kg per year in Asia, North America and Europe is higher than the global average of 20 kg. This reflects the various factors that affect fish consumption: how available fish is, how expensive it is, whether there are dietary traditions in relation to fish and how developed the country is. Generally, the lower the income, the lower the consumption of fish.

The World Health Organization (WHO) recommends the regular consumption of fish – one to two portions a week (WHO 2002).¹ With an average portion size of 150 g, this results in a worldwide recommended annual consumption of 11.7 kg fish per capita. Several national nutrition guidelines were also analysed for this study. They operate within a similar range, averaging 10.6 kg of fish per capita per year (see Table 6 in the appendix).

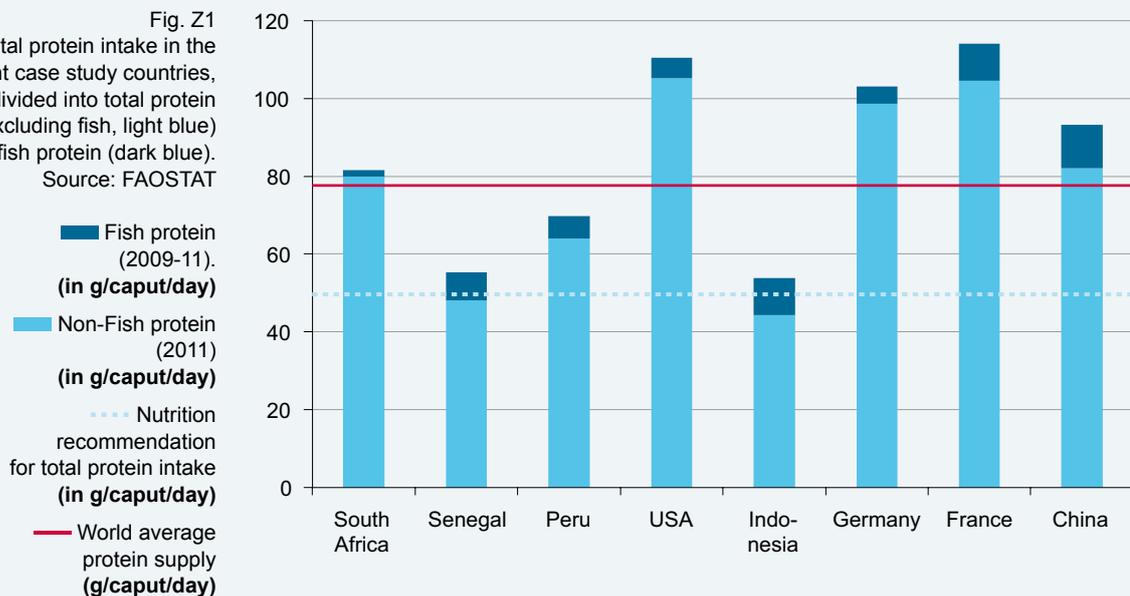
However, this rough guideline only applies in Africa and Latin America; all other regions in the world consume significantly more fish (Figure Z1). Globally, an average of more than 20 kg of fish is currently consumed per capita per year (FAO 2016). The average German also consumes roughly 14 kg of fish per year, more than the recommended intake.² In general, Germans eat too much protein. Depending on the individual age group, they consume between 130 and 160% of the recommended amount (MRI 2008). We are thus eating more protein and more fish than we really need. As the world's population grows and the population density constantly increases in coastal areas, the question arises of whether we are satisfying our need for fish at the expense of those who actually need it. Viewed at a global level, fish is already distributed unequally and too much fish per capita is eaten in the Northern hemisphere.

Staple foods like corn, rice and other cereals account for a large share of the dietary pattern of poor people. The consumption of fish is important in correcting the imbalance between calories and protein. Fish is generally not only cheaper than other animal protein but is also often a basis of local and/or traditional recipes. In countries like Senegal or Indonesia, fish accounts for up to 40% of the total intake of animal protein.

In absolute figures, the consumption of animal protein in developing countries is lower than in developed countries. However, the share of animal protein in total protein is growing very rapidly. This is due primarily to economic development and the way in which developing countries in Africa and Asia are 'catching up'. If we make a distinction between fish and meat in the consumption of animal protein, it becomes clear that the contribution made by fish to the supply of animal protein has fallen slightly since 1990 – primarily in favour of meat.

In poor countries, where fish is traditionally eaten, rising income leads to an increase in the consumption of meat and higher-quality fish species. Conse-

Fig. Z1
Total protein intake in the eight case study countries, subdivided into total protein (excluding fish, light blue) and fish protein (dark blue).
Source: FAOSTAT



quently, small pelagic fish (those that live in the open sea between the surface of the water and the bottom of the sea) are replaced by larger demersal species.

Between 1990 and 2012, the consumption of wild-caught fish remained almost constant while the consumption of fish cultivated through aquaculture increased five-fold. In 2015, half the volume of fish produced for human consumption came from aquaculture, compared with just 5% in 1962 and 37% in 2002 (FAO 2015).

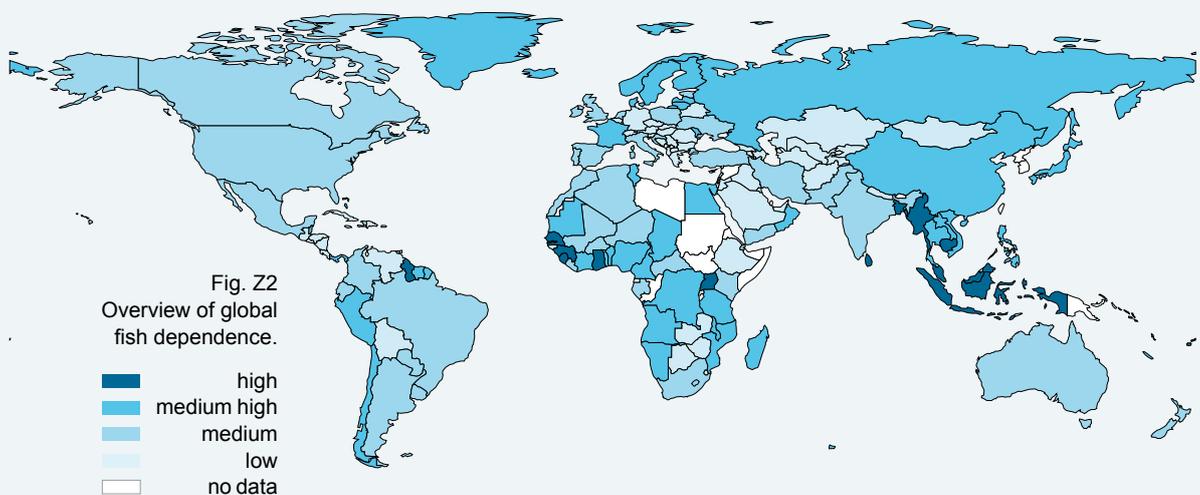
From a global perspective, there is enough food to feed everyone in the world. If we also take the current protein supply as a basis, there is no protein gap. Food distribution problems are actually at the heart of hunger issues.

The global average supply of protein was 79 g per capita per day in 2011, while the average protein requirement was 49.6 g per capita per day. The latter figure was calculated on the basis of the recommended 0.8 g per kilogram of body weight and the average weight of a person in 2011 (62 kg). Measured against the WHO's recommended intake, the 79 g corresponds to an oversupply of protein of around 30%.

Figure Z1 shows the protein supply in the countries that were selected as examples for this study: South Africa and Senegal, Peru and the USA, China and Indonesia, Germany and France. The height of each bar represents the total supply of protein, subdivided into dark blue areas for fish and light blue areas for other proteins.

The New Fish Dependence Index

Our fish dependence index measures the level of dependence on fish as a source of income and nutrition (especially protein). It is based on the composition of a number of factors: a) food security (incidence of malnutrition in % of the population); b) fish consumption (share of fish in the total consumption of animal protein in %); c) national catch quantity per capita; and d) gross domestic product (GDP) (in USD; capacity to replace fish by other protein-rich food). See section 2.5 for further details on the index.

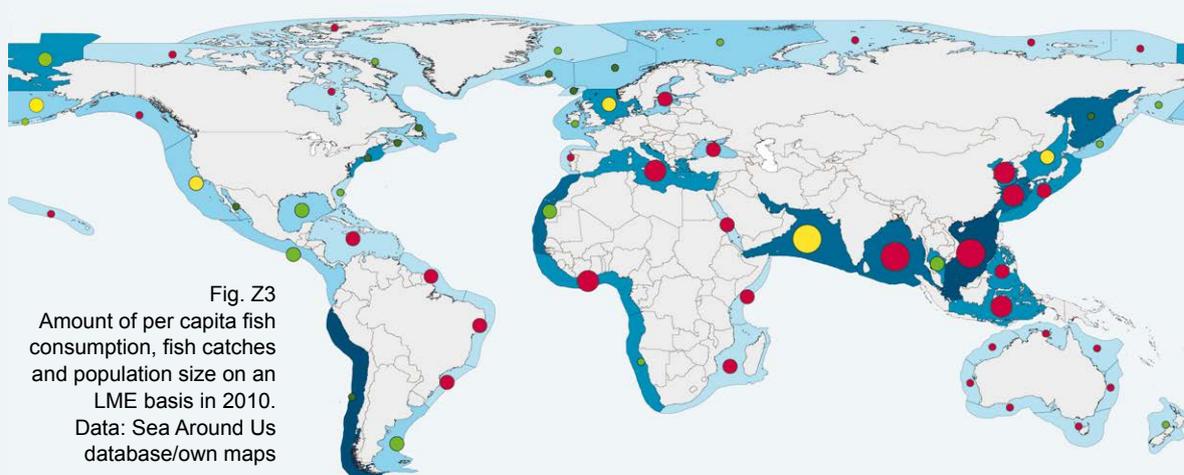


In Figure Z2, we link the country-specific situation of food (in)security and the general situation regarding health and hunger with the value of fish and fisheries to the country's socioeconomic status and the livelihoods of its citizens in order to describe the fish dependence of individual countries. The index shows that countries with a high share of fish in their diet are particularly dependent on fish. More importantly, however, these countries (in dark blue) are precisely the countries that tend to have a large fisheries sector and are neither wealthy nor particularly food secure.

According to this index, Senegal, for example, appears to be particularly dependent on fish. At the same time, Senegal is also an example of the complexity reflected in this statement. According to estimates based on FAO figures, approximately one million people are directly or indirectly dependent on fishing in the country. Fish accounts for 44% of animal protein intake but just 12% of total protein. If the global recommendation of 11.7 kg of fish per person per year is taken as a reference, the annual average per capita consumption of 24 kg of fish in Senegal is 'too much'. At 60 g per capita per day, protein supply is also above the required value of 49 g. Thus, on the one hand, a moderate decline in fish intake would not lead to a protein gap in Senegal. Nevertheless, 10% of the population is undernourished and fishing is the main source of income in rural coastal regions (Thiao et al. 2012). So even though the protein supply would be sufficient, a shrinking fisheries sector would probably see an increase in poverty and hunger in the coastal regions (Lam et al. 2012) with the potential consequence of political instability.

Fish Demand and Fish Supply

We wanted to know which regions in the world can meet their requirements through their own production now and in the future and where there is a growing dependency on imports to meet demand. To do this, we subdivided the world's seas into 64 large marine ecosystems (LMEs). These 64 ecosystems supply up to 95% of the annual global fish catch (Sherman et al. 2009) and present quite specific challenges for regional, and in some cases, multinational management. Then we calculated whether the fish catches in these regions in 2010 were able to meet the local demands of people in the neighbouring countries for fish. To this end, we drew on the data from the Sea Around Us project conducted by the University of Vancouver (Sea Around Us database).



Pop. 2010 Scenario (mn)

- > 50
- 50–150
- 150–500
- 500–1,000

Fraction

- 0–80%
- 80–100%
- 100–500%
- > 500%

Catches (mn tons)

- no data
- 0.01 – 0.60
- 0.61 – 1.50
- 1.51 – 4.00
- 4.01 – 8.00
- 8.01 – 12.86

Figure Z3 shows the LMEs. The productivity of the regions differs significantly: red or yellow means ‘does not supply enough fish to meet local demand’; light green and green mean ‘supplies enough/more than enough fish to meet local demand’.

LMEs with several neighbouring countries (such as the Mediterranean, Caribbean Sea and Baltic Sea) appear to be less able to cover local demand, whereas LMEs with only one or a few neighbouring states perform better. Moreover, the highly productive LMEs in the North Atlantic and East Pacific are generally better able to meet local demand. This also applies to Europe, the East and West Coast of the USA and the western coast of Latin America. By contrast, fish production in the LMEs around Africa (with the exception of Northwest Africa) and along the Asiatic and Australian coasts is inadequate when compared to current demand.

The Bio-economic Model

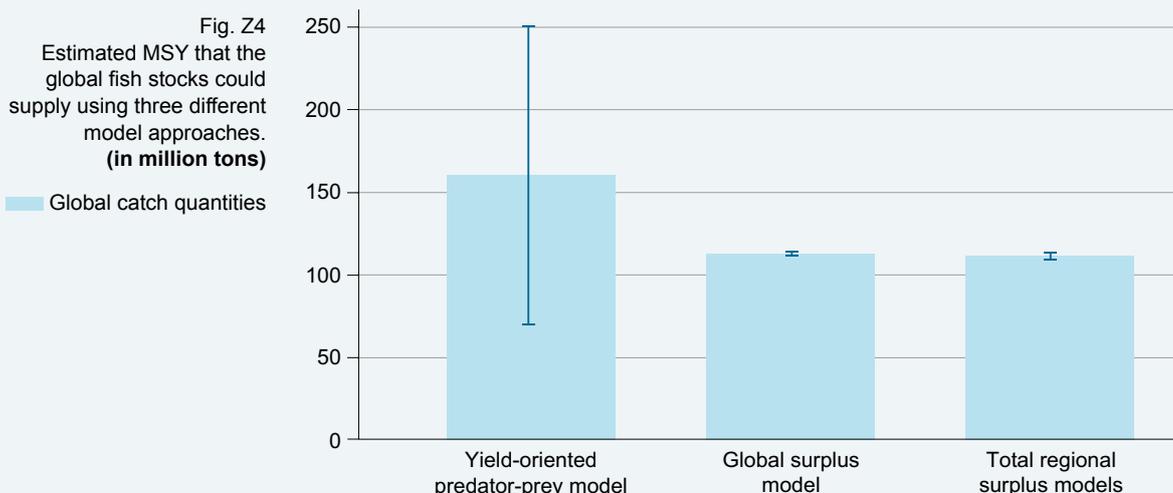
Looking ahead to 2050, we are projecting future global fish catches and possible effects on fish consumption. As fish catches are generally affected by fishery activity and the productivity of stocks, we need to apply a bio-economic model to determine future catches. This model combines an ecological aspect, which describes the productivity of fish stocks, and an economic aspect, which describes the economic incentives for carrying out fishery activity and the distribution of fish catches across the markets.

The model is designed to explain how the total volume of fish catches changes in different economic and fishery management scenarios and how the total global catch is distributed in terms of regional catches and regional consumption quantities.

We based the modelling framework on various current fishery management systems. A new element of this approach is that we include interactions in the sea. The fish include predator and prey species and both are caught. Previous studies with comparable global research approaches ignored the biological interactions and either included all fish species in one model (World Bank 2009) or considered stocks that are biologically independent of one another (Quaas et al. 2016; Costello et al. 2016).

Results

For our projection we assume a Maximum Sustainable Yield (MSY) management scenario for all fisheries. The projection calculates the MSY, which provides an indication of the maximum contribution that global fish stocks could theoretically make in supplying the world's population with protein in 2050. The estimated MSYs for the global fish stocks using three different model approaches are presented below.



The first bar shows the global catch quantity for a purely yield-oriented predator-prey model. The first model determines the productivity of global fish stocks based on the interactions between the predatory and prey fish: only when the stocks of large predatory fish are depleted can the catch of their prey fish be increased significantly, thus increasing the total volume of the overall catch. Consequently, the objective of fishery management in this model is to maximise catch quantities. However, an MSY of 160 million tons in 2050 can in principle only be achieved at the expense of marine biodiversity. The increased catch quantity is accompanied by a high level of uncertainty (± 90 million tons). This is a typical effect following the destabilisation of the predator-prey balance. If all other target values for healthy seas as a prerequisite for healthy fish stocks are disregarded – for example intact habitats or the minimisation of unwanted bycatch – a higher catch quantity would be possible but would be neither desirable nor sustainable from an ecological perspective.

The second and third bars, on the other hand, show a stable maximum catch for Schaefer surplus models. Such a model specifies that the utilisation rate may not be higher than the natural growth rate of renewable resources. We first calculated the surplus model for the entire sea and assumed one global stock (second bar); we then calculated it for the 64 individual LMEs (third bar) and assumed one stock for each of them. When added up, the result of the third model agrees with the result of the second model: both project around 112 million tons of fish for 2050. We use the surplus model to analyse the potential contribution that the LMEs could make to meeting the global and regional demand for fish protein.

We retrospectively calculated a total global catch of 101 million tons of fish for 2010. This means that current catch quantities cannot be increased by more than 10% in the future. Accordingly, marine resources already seem to be almost fully exploited.

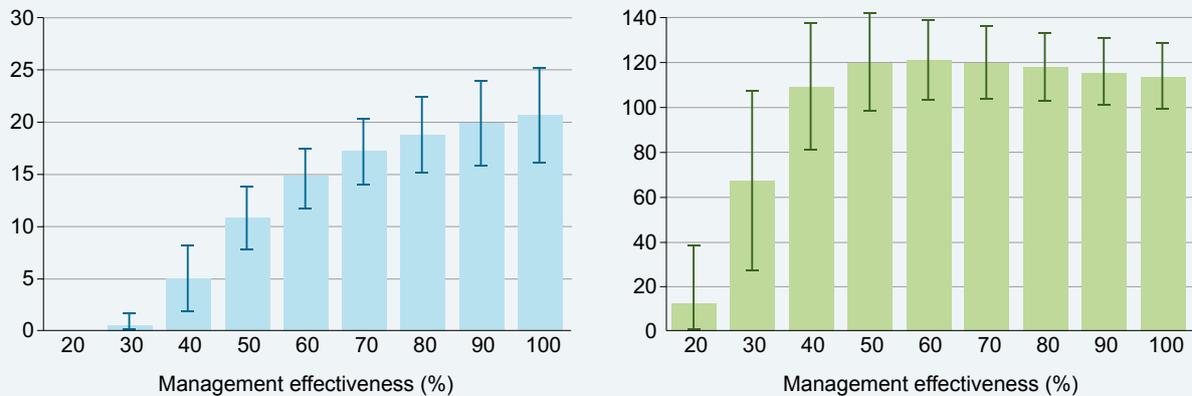


Fig. Z5
Global fish catches in 2050 according to global bio-economic predator-prey model. The model shows varying degrees of management effectiveness and assumes GDP growth according to baseline scenario SSP1 (see section 4 for details on the model).
(in million tons)

■ Global catches of predatory fish
■ Global catches of prey fish

We also studied how various levels of fishery management effectiveness affect catch quantities. Our analysis concluded that if fishery management effectiveness reached 100%, marine biodiversity would be secured, global catches of predatory and prey fish would reach levels of 21 and 116 million tons, respectively, and a total of 137 million tons of fish would be caught sustainably (Figure 23).

If management took into consideration all potential effects of fishery activities on future fishing opportunities, 100% effectiveness would be achieved. Optimum management from an economic perspective would also stipulate the total allowable catch for individual stocks in such a way that it actually regulates and restricts fishery activities.

We come to the conclusion that only a management system that focuses on relationships in the ecosystem can meet the various needs of a sustainable fishing industry: to achieve high catch volumes while increasing ecosystem resilience by protecting marine biodiversity and habitats.

The effectiveness of fishery management is currently estimated at an average of between 50 and 60% (Mora et al. 2009; Watson et al. 2009; Quaas et al. 2016). There is thus considerable scope for development here. Current catch quantities could be maintained at this level of effectiveness. However, the large predatory fish would have to be heavily fished in order to reduce the pressure on smaller prey fish, thus allowing for slightly larger catches. In fact, that is currently common practice. Compared to the model of best-possible management, this would cause a loss of stability in the balance of the ecosystem and shift future fish consumption in the direction of prey fish.

If management effectiveness slipped below the current level, this would be expressed in a sharp reduction in the catches of both predatory and prey fish. This means that ensuring the maximum possible effectiveness of fishery management is critical for maintaining catch yields in the face of simultaneous increases in the global demand for fish.

In the last step, we analyse how the LMEs can help to cover the global requirement for protein. To do this, we use the estimates from the third model (surplus model for 64 LMEs) and compare them with projected regional fish consumption. We use international estimates of future socioeconomic development for the projections, e.g. population trend and economic growth (Shared Socioeconomic Pathways, SSP – see footnote 3).

In the SSP1 scenario with the lowest assumed population growth, the global fish supply in 2050 will be able to meet approximately 81% of the global requirements of what will then be almost 8.5 billion people. In the SSP3 scenario, where population growth is strongest, only 75% of fish requirements will be met by wild-caught fish by the same date.

It is generally assumed that the huge growth rates in aquaculture seen over the last 30 years were needed to meet the world's growing appetite for fish. In terms of numbers, half of the world's fish currently comes from aquaculture production. If the results of our projections are accurate and the volume of fish catches in 2050 could meet around 80% of the world's requirements, the need for further growth in aquaculture production would abate if the fish was distributed in a more equitable manner.

And the distribution problems are continuing to grow: fish consumption in the regions along the East Asian coast could decline significantly by 2050. Fish is traded globally and prices depend on global demand. If fish prices increase accordingly based on this demand, fish will become unaffordable for a large swathe of the population of LMEs along the East Asian coast. These people would have to switch to affordable alternative sources of protein and fish would be exported at a higher export price.

Key Findings of the Study and WWF Comments

1 According to the projections made by this study, it will on the one hand be possible to fish approximately 112 million tons of fish around the world in 2050 if the current moderate level of fishery management effectiveness remains the same. On the other hand this would risk the health of predatory fish stocks which will be fished too hard. This may cause a perilous destabilisation of the ecosystem. It would appear that marine resources are already close to fully exploited (2010: total catch of 101 million tons), leaving little room to increase catch volumes in the future.

There is only one way to increase global catch quantities that is both relevant and sustainable and thus meets the growing demand: fishery management must be improved significantly worldwide and any decisions made must place far greater emphasis on ecological interactions than has been the case to date. The interactions between predatory and prey fish is one such example. This type of differentiated, economically optimised and fully enforced management system could enable sustainable catches of approximately 137 million tons worldwide in 2050.



Improve Management

Fishing is exerting considerable pressure on fish stocks and their habitats in all areas of the world's oceans. WWF is committed to an ecosystem-based fishery management that safeguards the future of marine ecology and the human population. Part of this strategy is not only to conserve vital stocks of large predatory fish but also to protect habitats and endangered species. Total allowable catch limits are set to actually regulate the fishing industry. From the current perspective, this management model would constitute a major improvement in quality and one that is urgently required to make fishing sustainable. Ultimately, it would lead to more fish, which could then be distributed more equitably.

Illegal fishing, which accounts for an estimated 30% of the global catch, is evidence of a particularly damaging consequence of poor management. It reflects increased competition and higher demand accompanied by weak controls. The European Union has a particular responsibility to solve this problem. Firstly, EU Member States must be more consistent in implementing the existing regulation against illegal fish imports. Secondly, they must ensure that any fishing activity they conduct in waters outside the EU is both fair and sustainable. Furthermore, EU agreements with third countries must focus on prioritising regional fishing and first and foremost guarantee that local populations are provided with local fish.

2 If the quality of fishery management, at a minimum, stays at its current moderate level, there would be enough wild-caught fish available in 2050 (112 million tons) to theoretically supply each world citizen with 12 kg (per person per year). This roughly matches the average quantity currently recommended by the WHO and a large number of countries.



More 'Fish Fairness'

WWF considers that the belief that there is enough fish for everyone requires closer scrutiny. Firstly, maintaining the status quo is simply not an option for global fisheries as tolerable limits have already been reached for 58% of stocks and exceeded for 31%, the latter being classified as overfished. In addition, there is currently no fair distribution mechanism for fish that is geared towards real needs. Secondly, the WHO's recommended intake of fish primarily focuses on the valuable micronutrients rather than on the protein. In many countries, the current demand for fish is well above the average WHO recommendation because the affected areas actually rely on fish for their basic protein supply and very few alternatives are available. In Senegal, 24 kg of fish are consumed per capita per year and fish provides almost half of the animal protein consumed. In Germany and France, per capita consumption of 14 and 32 kg respectively also exceeds the WHO's recommended 11.7 kg. However, in these countries, fish provides just 7% of the animal protein consumed. Even if we were to abstain completely from fish in northern Europe, we would not suffer from protein deficiency. The situation is very different in poorer regions with high levels of fish consumption.

3 We can assume that developed countries will use the option of importing fish at higher prices when they are confronted with a shortage in fish supply in 2050. Developing countries with abundant fish stocks will then export their fish rather than eat it themselves. Rich countries would thus still be able to afford 'their' fish in the future while poorer nations would not. For poor coastal countries, the probability that poverty and hunger will become more widespread within their borders increases.

In 2050, LMEs in Africa and in Latin America (with the exception of northwest Africa and Peru) and those along the Asian coast will not be able to meet the local demand for wild-caught fish. Neighbouring countries of LMEs in East Asia, West Africa and in western South America could export their fish due to high fish prices and low prices for substitute goods. On the other hand, developed countries with high purchasing power such as Australia and the USA would probably increase their fish imports. Germany, France or South Africa could import fish from other marine regions to offset the major shortfalls that will sometimes occur in their own supply.



I Can Have Your Fish and Eat it

Today, Europe imports about a quarter of the world's total fish catch and represents the largest market for fish and fish products globally. More than half of the fish imported into the EU originates in developing countries. In statistical terms, we in Europe have already eaten all of the fish from our own waters by the middle of any given year. For the remainder of the time, we eat imported fish which is then missing elsewhere as a source of nutrition and/or as the cornerstone of local economic structures. The high demand for imported fish would almost certainly decrease if fish stocks in the European Union's own waters were once again at healthy levels.

We must assume that fish consumption in the Northern hemisphere will have an even more serious impact in the future on the living conditions of those who depend on fish in various ways. Moreover, our analysis of distribution flows clearly suggests that any additional catches will not be used to meet the growing demand in fish-dependent countries. However, the increasing scarcity of resources and unequal distribution of marine fish must not be borne by the poorest countries. This would fuel conflicts and exacerbate instability particularly if the fishing sector is not better regulated.

WWF Conclusion

Our report 'Fishing for Proteins – Impacts of marine fisheries on global food security to 2050' identifies the key factors driving a sustainable future fish supply. It also highlights that consistent changes are required in the fishing industry and in its administration to ensure that the worldwide problems of hunger and poverty do not continue well into the future. That would be contrary to the commitments set out in the United Nations plan of action for the future: ending hunger and poverty by 2030 are two of the 17 Sustainable Development Goals (SDGs). To achieve these goals, fishery management, amongst other things, must be improved significantly everywhere. Apart from bad management, fish stocks also suffer from the effects of climate change as well as the pollution and destruction of their habitats. Investment in improved fishery management, in sustainable aquaculture, in the protection of vital marine habitats and in fair trade policies would restore the productivity of our seas and pay off for billions of people in developing countries. Our results clearly show that the world's growing population must not serve as an excuse for even more reckless exploitation of our seas. In fact, the solution to these problems can be achieved by implementing and enforcing ecosystem-based and sustainable fishery management. In addition, fair access rights and prices must be guaranteed. An increasing supply of sustainably produced, fair trade fish is not merely intended to ease the conscience of European consumers; it must also benefit fishermen and fish farmers in developing countries with measurable effects.

The responsibility for this rests with us – not only politically but also as consumers.

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Why we are here

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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