WWF

EXECUTIVE SUMMARY

MOZAMBIQUE: BUILDING A SUSTAINABLE SHRIMP FISHERY

HOW EU CONSUMERS, CORPORATES AND AUTHORITIES CAN IMPROVE SOCIAL, ENVIRONMENTAL AND ECONOMIC CONDITIONS IN THE DEVELOPING WORLD

ACKNOWLEDGEMENTS

Written and edited by WWF Mediterranean - Portugal / Evan Jeffries (*www.swim2birds.co.uk*), primarily based on data contained in a recent report: A Case Study of the semi-industrial and Industrial Shallow-Water Shrimp Fishery in Mozambique by Robin Davies (consultant) in July 2016

Design by Marco Neves Ferreira

Front cover photo: © WWF-US / James Morgan /

WWF, Portugal /MZ – © / WWF References and sources are available online at www.wwf.pt

Published in June 2017 by WWF – World Wide Fund For Nature (Formerly World Wildlife Fund).

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WWF is one of the world's largest and most experienced independent conservation organizations, with over 5 million supporters and a global network active in more than 100 countries. WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.

This report has been produced as part of WWF's EU co-funded Fish Forward Project. Fish Forward aims to raise awareness of the global impact of seafood choices made in Europe and their effects on people living in developing countries. www.fishforward.eu

Disclaimer: This publication is co-funded by the European Union. The contents of this publication are the sole responsibility of WWF and can in no way be taken to represent the views of the EU.

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INTRODUCTION
LOCAL CHOICES, GLOBAL IMPACTS

The European Union is the world's largest seafood market. What we decide to buy has global consequences on social, environmental and economic levels – and if we make our choices wisely, we can make a significant contribution to international development. In fact, this is one of the EU's stated aims, embodied in the ongoing Fish Forward campaign to raise awareness of the impacts of our buying decisions.

WHEN WE ENGAGE WITH PARTNERS AROUND THE WORLD, IT'S CRITICAL THAT WE HAVE A CLEAR UNDERSTANDING OF THEIR PARTICULAR CIRCUMSTANCES AND THE CHALLENGES THEY FACE

In order to make the right choices, it's important to understand the individual markets we deal with: while the overarching principles of seafood sustainability apply in every ocean, each country and each fishery also has its own unique features. When we engage with partners around the world, it's critical that we have a clear understanding of their particular circumstances and the challenges they face.

This report focuses on the shrimp fishery in Mozambique. It's a fishery at a crossroads: if the right actions are taken over the next few years we could see sustainable stocks, reduced environmental impacts, increased profitability and improved lives for many thousands of people – but an alternative scenario of collapsing stocks, environmental destruction and social hardship is equally possible.

What happens next really matters. This report explains why.

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MOZAMBIQUE
FISHING AND DEVELOPMENT IN A LOW-INCOME COUNTRY

28
MILLION PEOPLE IN MOZAMBIQUE;
20% RELY ON FISHERIES FOR PART OF INCOME

2,500 KM
COASTLINE ALONG THE SOUTH-EAST OF THE AFRICAN CONTINENT

Mozambique is home to some 28 million people, and has a coastline of more than 2,500km along the south-east of the African continent. Sixty per cent of the population live in coastal areas.

Mozambique gained its independence from Portugal in 1975. It's classed as a low-income country by the World Bank, but its economy is growing fast. Large-scale foreign investment has recently been attracted by extensive reserves of coal, gas and other minerals, and GDP is increasing by about 7% each year. However, ineffective wealth distribution means that these investments haven't filtered down to poorer communities: poverty remains extensive and infrastructure is under-developed.

Fishing activity plays a major role in Mozambique, thanks to the nation's long coastline and an abundance of fish in its waters. Mozambique's Exclusive Economic Zone in the Indian Ocean takes in the fast, southerly-flowing Agulhas current. This cold-water upwelling of nutrient-rich water supports many fisheries of commercial importance. **Twenty per cent of the population (around 850,000 households) rely directly on fisheries for part of their income, and a larger number rely on fishing for subsistence. Fish accounts for half of the population's protein intake**.

FISHERIES ARE ESTIMATED TO CONTRIBUTE €406 MILLION TO MOZAMBIQUE'S GDP, WITH EXPORTS OF ABOUT €63 MILLION. THIS REPRESENTS AN ANNUAL MARINE CATCH OF AROUND 150,000 TONNES

Fisheries are estimated to contribute €406 million to Mozambique's GDP, with exports of about €63 million. This represents an annual marine catch of around 150,000 tonnes. Ninety-one per cent of the catch comes from artisanal fishing, 2% comes from semi-industrial operations, and the remaining 7% comes from industrial fishing. However, in terms of total value, export-driven industrial fishing contributes about 52%.

The Mozambique shrimp industry

Shrimp is one of Mozambique's main fisheries, and has long been part of local diets as well as becoming an increasingly important export. Both deep and shallow water species are targeted, with fishers working everywhere from mangroves and beaches along the coastline to areas of the continental shelf some 150km offshore. Shrimp vessels also catch a variety of bycatch (lobster, crayfish, crab, cephalopods, finfish and turtles), some of which contributes to their revenues.

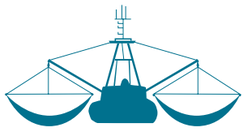
MOZAMBIQUE'S SHRIMP FLEET IS DIVIDED INTO THREE SECTORS:

Artisanal sector

About 40% of the annual shrimp catch (approximately 2,273 tonnes in 2014) comes as high-value bycatch from the artisanal sector. Fishers mainly use beach-seines, deployed from canoes then hauled ashore by 10-14 people, aiming to catch fish. The nets tend to have small meshes – in fact, stitched-together mosquito nets are sometimes used – so there's always a high bycatch of non-target species, including many juveniles. The catch is usually landed at beach sites and is mostly consumed locally, as facilities producing the ice needed for on-site preservation are limited to major urban centres. Beach seining is an important source of food and income for coastal communities.

Semi-industrial sector

The semi-industrial sector comprizes larger vessels of 10-20m, which fish much further offshore using otter trawls. Most of the activity takes place on the highly productive Sofala Bank, a wide shallow shelf area 140km from the coast. Although 43 semi-industrial vessels are registered, currently around 14 vessels are active, 5 of which have onboard freezing capabilities. Most of the harvest is sold domestically, with the latter vessels able to export their frozen catch to international markets.



Industrial sector

Vessels in the industrial sector average around 30m, with freezer capacities of 40 to 60 tons. Around half of the 72 registered industrial vessels are currently active. This sector fishes both deep and shallow-water shrimp species, with most of its high-value catch going to export markets, especially the EU and Asia. Most vessels in this sector are associated with vertically integrated private companies, particularly in Spain and Portugal, and operate in joint ventures with the Mozambican government.

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Overfishing in Mozambique – Multifactorial Causes

TOGETHER FOR CONSCIOUS SEAFOOD CONSUMPTION

Illegal, unregulated, and unreported (IUU) fishing

Shrimp stock overfished

Risk of turtle by catch*

*estimated at 1.500 turtles/year

20% of population depend on fisheries and associated industries

(coastal) Artisanal Fishing

local/national market

(open sea) Semi-industrial Fishing

national/international market

(open sea) Industrial Fishing

international market (82% to the EU)

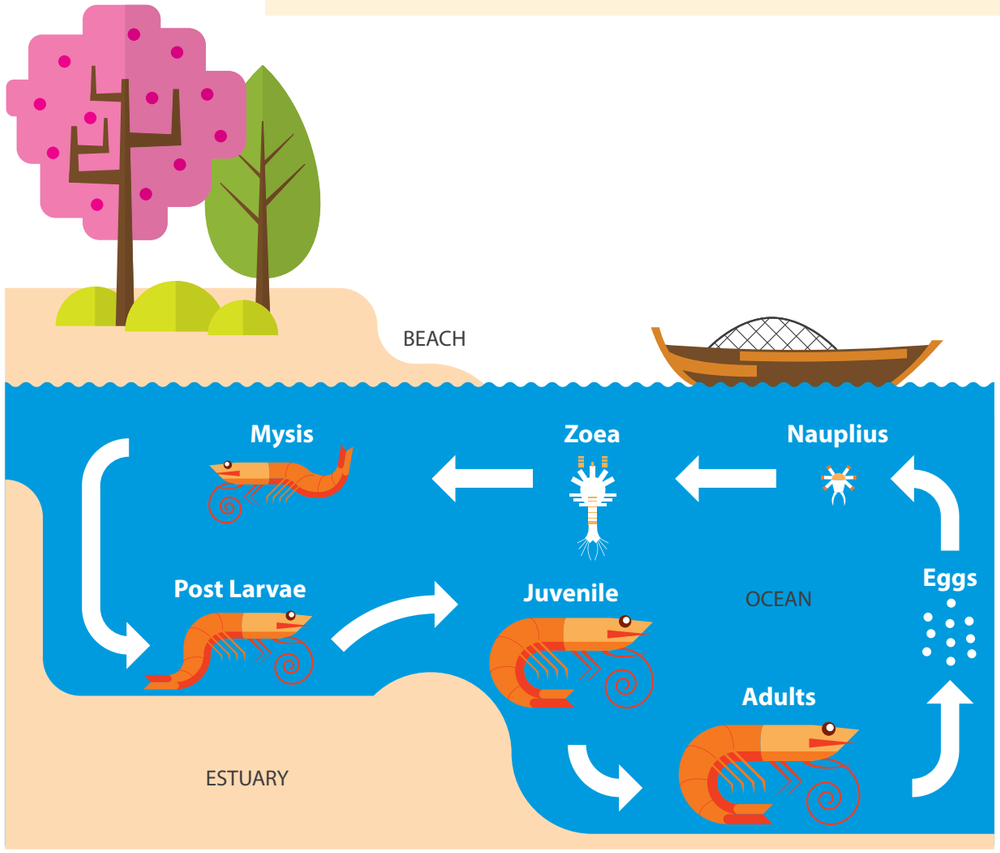
WWF Recommendations

- Improved monitoring at all levels
- Corporate international buyers to support sustainable management and demand sustainable shrimp
- EU to urge the implementation of TED in the fisheries (Turtle Excluder Devices)
- Respect needs of dependend coastal communities in management
- Protect important habitat (e.g. mangroves)

Despite their different natures, the activities of the three sectors all impact the same stocks, and the ongoing health of the stocks is under threat. This is discussed in more detail below.

Lifecycle of penaeid shrimp

Most shrimp species migrate offshore to mature, mate and spawn. Post-larval shrimp are carried by oceanic currents to estuaries and mangroves, where they find food and shelter for four to five months, before migrating back to the open ocean for their adult lives. During the day, most shrimp species stay on the bottom of the ocean, feeding on worms, small crustaceans and marine plants. At night they migrate upwards, feeding on small pelagic crustaceans but also serving as prey for many kinds of fish.



Threats to shrimp stocks: an unstable outlook

Despite their relative abundance, Mozambique's shrimp stocks are vulnerable to over-exploitation, and in many areas they can no longer support existing fishing levels. This threatens livelihoods as well as biodiversity. The industry also faces other risks, from environmental degradation to climate-linked demographic change.

OVERFISHING

Mozambique's shrimp stocks are being fished in an unsustainable way by all three fleets.

Nearest to the shore, artisanal fishermen catch shrimp at the juvenile stage, before they've had a chance to settle in deeper waters to grow and reproduce. While the small, light nets used from the beaches are relatively harmless in terms of habitat destruction, they simply don't allow enough of the future spawning stock to get past first base.

There's also too much pressure in the semi-industrial sector. In the decade to 2012, shallow-water shrimp landings fell from 9,000 tonnes to 1,800 tonnes. Partly this is due to the increase in artisanal catches, but it's also a simple case of overfishing by the vessels involved, targeting too many of the wrong stocks of shrimp at the wrong times of the season.

In deeper water, the heavy trawl gear used is posing an increasing risk to shrimp habitats, magnifying the effect of overfishing.

IN THE DECADE TO 2012, SHALLOW-WATER SHRIMP LANDINGS FELL FROM 9,000 TONNES TO 1,800 TONNES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IUU fishing

Illegal, unreported and unregulated (IUU) fishing is a significant global problem, accounting for between $10-23 billion and 13-31% of the global catch annually. It jeopardizes ecosystems, food security and livelihoods; distorts competition, putting responsible fishers at a disadvantage; and is associated with transnational crimes and slavery at sea.

IUU fishing is common in the south-west Indian Ocean, due mainly to a lack of financial resources to invest in Monitoring, Control and Surveillance (MCS) activities. It's certainly a problem in Mozambique, where it's estimated that 40% of vessels don't submit their logbooks for inspection. The cost to the national fishery is thought to be between $35-67 million each year. Just as importantly, having so much 'unknown' activity taking place undermines data-based efforts to monitor and manage populations – so IUU fishing increases the risk posed to the long-term health of shrimp and other stocks.

Bycatch

Tropical shrimp trawls typically use nets with small mesh, and catch a relatively high proportion of small fish, juvenile larger species and myriad other creatures including sharks and turtles. It's estimated that bycatch rates can be as high as 85%. While some of the species caught as shrimp bycatch now provide fishers with an important income in their own right, the overall effect on ecosystems of such indiscriminate capture can be devastating.

Efforts to reduce bycatch are ongoing, but face considerable resistance due to industry fears that any measures taken will also reduce the amount of shrimp taken. However, significant action is unquestionably needed: for one thing, as we explain below, Mozambique could lose the majority of its shrimp export market if it doesn't make a meaningful effort to end overfishing and harmful practices to the wider marine environment, and safeguard the five species of marine turtles that are present in its waters.

Climate change

Mozambique ranks third among African countries most vulnerable to climate change, which compounds the challenges faced by coastal communities. Significant floods in 2000-2001 caused around 800 deaths and more than $750 million of property damage, with a direct impact on 4.5 million people. The coastal road infrastructure is vulnerable to erosion from flooding and sea level rise, threatening trade and making it difficult to improve distribution networks. More droughts and lower agricultural productivity may prompt increasing numbers of people to shift from farming to fishing, putting further pressure on dwindling stocks. During periods of low rainfall, estuaries – important habitats for young shrimp and other commercial species – get smaller and can be blocked from the sea by sand banks, resulting in fewer juveniles making it to the open ocean.

© Lyn Trelear / WWF

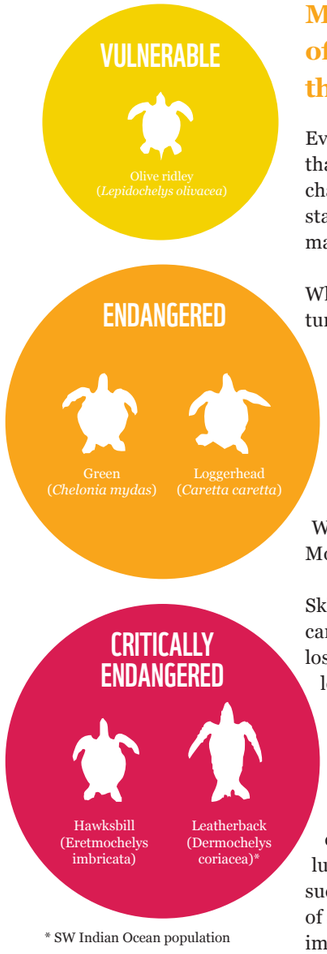
More research is needed to better understand the detail of the risks and the steps that can be taken to combat them, but climate change is undeniably significant for the shrimp industry in Mozambique.

Other ecosystem threats

Mozambique is developing rapidly, but this is coming at a heavy environmental cost. Industrial, domestic and agricultural pollution threaten near-shore habitats; while between 1990-2002 Mozambique's mangroves – a vital nursery for juvenile shrimp – decreased in area by almost 27%. Seventy-six per cent of coral reefs in the region are also under threat.

The whole industry suffers from these environmental factors, yet sees little or none of the economic benefits of the development that's catalysing them.

THE TURTLE PROBLEM: WHY DEDICATED ACTION ON FISHERIES IS ESSENTIAL



* SW Indian Ocean population

Mozambique has five of the world's seven species of marine turtles in its waters. All of them are threatened.

Evidence shows that tropical shrimp trawling operations cause more turtle deaths than all other human activities combined, so this is a really serious conservation challenge. Most of the trawl deaths are caused by drowning, and turtles at all life stages are affected indiscriminately: with their slow growth rates and late sexual maturity, populations are coming under increasing pressure.

While accurate figures are hard to establish it's estimated that around 1,500 marine turtles are caught by Mozambique's prawn trawlers each year.

Nevertheless, there's an obvious and effective solution to the problem: Turtle Excluder Devices (TEDs). The TED is a grid that fits into the narrow neck of a trawl net, diverting turtles (and other large fauna or objects) through an escape hatch, while retaining the shrimps. TEDs have been shown to reduce turtle deaths by up to 97%.

What's more, since 2004 TED usage has in fact been compulsory under Mozambique's national legislation. Unfortunately, the regulation is widely ignored.

Skippers fear TEDs would reduce their shrimp catches by 15-20%. However, a study carried out in the US shrimp industry put the figure at just over 2% – and this small loss is more than compensated for by advantages including swifter catch processing, less net damage, reduced fuel costs and higher market prices for better quality shrimp (crushing by turtles or other large objects is lessened).

Mozambique's non-compliance with its own regulations on TEDs is having an impact on more than just the turtles: it's also jeopardizing its own export potential. The US – one of the world's largest shrimp importers – only trades with countries with effective turtle bycatch reduction measures in place, so this whole lucrative market is closed. The EU (on which Mozambique heavily relies) has no such condition in place for now, but with growing European consumer awareness of and support for sustainability this may change in future – a move which would immediately threaten 82% of Mozambique's shrimp exports.

BETTER MANAGEMENT, BETTER STOCKS, BETTER RESULTS

In general terms, the world's fish stocks are in crisis. Current fishing practices and governance regimes are a significant threat to food security, livelihoods and entire ocean food webs.

Consumers – particularly in Europe and the US – are waking up to the situation, and in recent years there has been a surge in support for sustainability and supply chain transparency. There are now ever-increasing calls on those who catch, supply, process and sell fish – as well as the authorities who oversee them – to ensure their products are from sustainable, well-managed sources.

The important point to note here is that such fisheries tend to perform better in the longer term in financial as well as environmental terms, so becoming sustainable is anything but a meaningless gesture to keep conservationists happy.

This applies to Mozambique as much as anywhere else, and the twin drivers of long-term stock stability and improved profit margins make a powerful case for better management of the shrimp stock – as does the risk of current export demand falling off in the light of changing consumer attitudes.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Over the past few years, Mozambique has recognized the importance of sustainability for export markets, and has undertaken various initiatives to move towards Marine Stewardship Council (MSC) certification for the industrial deep-water fleet.

There's still some way to go before certification can be achieved. Stocks, ecosystems and management regimes all need serious attention – but the issues that need to be resolved have been clearly identified, and practical steps are gradually being taken through a WWF-supported Fishery Improvement Plan (FIP) in the industrial deep-water shrimp fleet. One of the main goals is to reduce fishing effort but to increase the value of the catch, which has both conservation and commercial benefits.

The shallow-water sector is more of a challenge to manage given the mix of semi-industrial and hard-to-monitor artisanal participants, but the same principle of aiming at reducing fishing effort while increasing value applies here too. Relatively simple steps can be taken to rebuild stocks, as has been shown by the first signs of stock improvement following enforced seasonal fishing closures. In addition, investing in infrastructure and auxiliary services like freezer facilities and ice production would considerably increase the potential profits that could be achieved from a higher quality, more effectively distributed catch.

In the longer term, an approach focused on achieving a maximum sustainable yield would mean the large stock fluctuations that have created uncertainty in the past would no longer occur, offering far greater job and food security and a more stable


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business and investment environment. Increased stocks would also create healthier ecosystems overall, and – along with improved fishing practices through better management – would benefit other fisheries targeting species currently caught at high levels as shrimp bycatch.

Obstacles: putting theory into practice

While it's true that making real-world improvements can be challenging, it's clear from other regions that effective results-based fisheries management brings benefits to the marine environment and all its users. In Mozambique, some key challenges need to be overcome to deliver such real change.

Overall lack of engagement remains a major obstacle towards sustainable fisheries management in Mozambique. In this fast-developing country with limited resources and competing government priorities, political will to take the shrimp industry in hand is lacking. However, only a comprehensive and committed management regime will succeed in reaching across the variety of actors involved in targeting the same shrimp stocks, from the subsistence fisherman with a mosquito net and dugout canoe to the European CEO of an industrial deep-water trawling operation.

WHILE IT'S TRUE THAT MAKING REAL-WORLD IMPROVEMENTS CAN BE CHALLENGING, IT'S CLEAR FROM OTHER REGIONS THAT EFFECTIVE RESULTS-BASED FISHERIES MANAGEMENT BRINGS BENEFITS TO THE MARINE ENVIRONMENT AND ALL ITS USERS

Money is always a problem, too. Increasing amounts of investment are flowing into Mozambique, but these tend to come in the form of capital-intensive 'mega-projects' that don't directly create jobs. Within fisheries, very little of the wealth generated from such projects is reinvested into improved management and infrastructure (e.g. research facilities, roads, ice plants), both of which are needed to increase the strength and value of the sector. The money is probably there, but a shift in priorities for its application is needed to ensure that directly impacted actors – the coastal communities and the natural resources and habitats on which they depend– can benefit from it

Making waves: what can EU consumers and authorities do to support a sustainable shrimp industry in Mozambique?

As the main export market for Mozambique's shrimp, the EU has a very significant role to play – and it can do its bit for sustainability in Mozambique too.

The EU plays a leading international role, with a strong tradition of environmental leadership. It's party to many international environmental

agreements; and has also endorsed many international guidelines and instruments related directly to fisheries, covering areas from IUU fishing and bycatch reduction to sustainability.

Given the general direction of affairs, it's increasingly likely that the EU will take additional measures in the coming years to ensure that its seafood imports – including shrimp from Mozambique – are from sustainable sources and don't cause social or economic hardships in the country of origin.

That's not to suggest that threatening an import ban would be a constructive approach to the situation, but it certainly gives a powerful lever to calls for greater engagement on best practice. Better communication will help. Raising awareness among the government and relevant businesses of the economic advantages of good management will incentivize action.

Action by the vertically-integrated Spanish and Portuguese companies involved in joint ventures with the government in Mozambique is needed. They should become powerful advocates for investment in better management and are well placed to work with industry associations and other stakeholders to push forward the MSC process, and instigate official FIPs.

The EU can support the necessary changes by offering human resources and financial assistance to the Mozambique government, although it's essential that this input has genuine cross-sectoral relevance – a challenge, given the diverse actors involved, but not an insurmountable one.

Meanwhile, European consumers can vote with their wallets and support fisheries committed to making themselves sustainable by choosing sustainable seafood. If shrimp from Mozambique becomes generally associated with poor environmental and social standards, it could lose considerable competitive advantage on the shelves.

Consumers and corporates need to be aware of the situation, and use the power they have to push for improvements. WWF and others are involved in several initiatives to help them do just that.

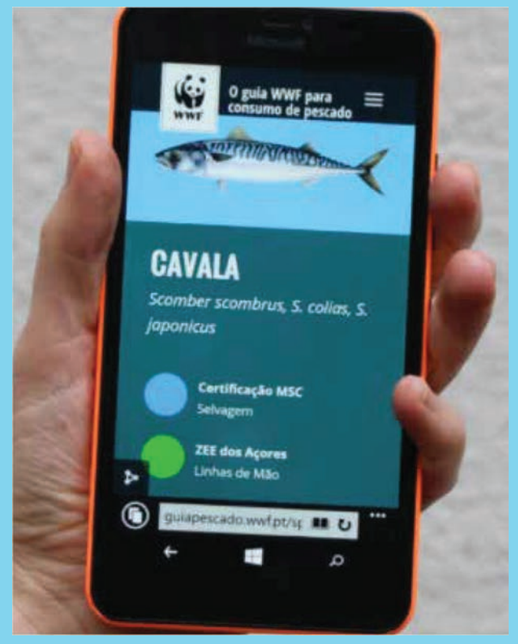
A sustainable future for Mozambique's shrimp industry is attainable, and we know what we have to do to get there. Now it's up to everybody to make it happen.

CONSUMERS AND CORPORATES NEED TO BE AWARE OF THE SITUATION, AND USE THE POWER THEY HAVE TO PUSH FOR IMPROVEMENTS. WWF AND OTHERS ARE INVOLVED IN SEVERAL INITIATIVES TO HELP THEM DO JUST THAT

WWF therefore

- Reaches out across implicated sectors to engage the shrimp fishery as a collective whole
- Works with the Mozambican government and industry to communicate the economic and social benefits of a sustainable approach
- Support efforts to embed sustainability practices through the MSC programme and FIPs
- Calls on donors and agencies to provide financial and logistical support to improve management and control systems, and to invest in improved facilities and infrastructure to maximize the value of the catch
- Calls for an urgent implementation of the Mozambican regulation to adopt TEDs
- Promotes and amplifies EU consumer demand for sustainable seafood

THE SUSTAINABLE SEAFOOD GUIDE



Educating consumers about their choices is central to saving and restoring fish stocks in the Mediterranean and beyond. There are three key points:

- Check the label to see what you're really buying;
- Don't eat baby fish which haven't had the chance to reproduce; and
- Try something different to reduce the pressure on the most popular stocks.

These are the foundations of WWF's multilingual Sustainable Seafood Guide series. These online guides (which are optimized for use on mobile devices) offer essential information on available products in 12 different European countries, rating a wide range of species with a traffic light system that helps inform shoppers. This runs from blue for 'certified' through green for 'give it a try' and orange for 'caution' to red for 'avoid'.

While simple to use, the guides are based on available scientific data: desktop risk assessments taking into account origin and gear mean it's possible for shoppers to go beyond general species-specific guidelines, and make buying decisions about fish sourced from particular fisheries. The data is updated regularly, so it always reflects what's really happening in the oceans.

If shoppers need more persuading to change their habits, the guides also feature delicious recipes from well-known chefs to inspire them to try something new.

www.fishforward.eu/en/online-seafood-guides-launched-in-several-eu-countries/

SEAFOOD IN NUMBERS

100% RECYCLED

TWICE IN 50 YEARS

Average global seafood consumption: 9,9 kg of seafood was consumed per person in 1960 to 19,9 kg of seafood was consumed per person in 2012

800 MILLION PEOPLE

Seafood secured an income for about 800 million people who are involved in the fishing or fish production and related industries

23%

The EU is the main importer of fish and seafood in the world and 61% of seafood traded globally comes from developing countries

62 KG/PER CAPITA/YEAR

Portugal is the largest consumer of seafood per capita in Europe and the third in the world and only 1/4 of this came from national waters

WWF

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.

panda.org