



**TOGETHER**  
*for a sustainable future*

## OCCASION

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# SUSTAINABLE FISHERIES

FROM HARVEST  
TO MARKET



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION





## FISHERIES FOR INCLUSIVE AND SUSTAINABLE GROWTH

### Vigorous fishing industries generate resilient communities

The old saying, “There are plenty more fish in the sea”, is less and less true. Over-fishing and disruption of the reproductive and growth cycles of fish have led to declining fish stocks. The consequences are grave because fish form a large and essential part of the world’s food supply. The situation is particularly serious for some of the world’s poorest countries, who rely on fishing to provide food, jobs and income.

The United Nations Industrial Development Organization (**UNIDO**) is tackling the problem through its unique approach to strengthening fisheries in developing countries and so helping to eradicate poverty.

### UNIDO: equitable, inclusive and industry-based

**UNIDO’s** mandate, most recently confirmed at the highest level by the United Nations 2013 Lima Declaration, is to foster Inclusive and Sustainable Industrial Development (ISID) in order to eradicate poverty throughout the world. **UNIDO** is today a leader of multi-sectoral global development initiatives.

**UNIDO** specializes in increasing economic competitiveness and sharing prosperity within a sustainable environment. To achieve these goals, **UNIDO** offers four mutually reinforcing services:

- Technical cooperation
- Analysis and advice on policy
- Introducing standards and compliance
- Knowledge transfer and networking

For **UNIDO**, economic growth is best achieved through Inclusive and Sustainable Industrial Development (ISID). Simply put, ISID harnesses industrial potential to achieve economic growth, sustainable development and lasting prosperity for all.

**UNIDO’s** approach is successful, with the result that it has become an internationally recognised and preferred partner for governments, businesses and communities in a number of core industrial sectors. A striking example is provided by **UNIDO’s** initiatives to increase food security and safety, the lack of which engenders economic deprivation and social inequality.

**UNIDO** translates its mandate into practical actions to build strong, sustainable industries which are the key to poverty eradication and social inclusiveness.

### A trade partner like no other

For realising industrial potential while maintaining sustainability, **UNIDO** has become a preferred partner for governments, international organizations, the private sector, academia, civil society, and communities around the world. Developing countries and economies in transition particularly benefit from its expertise.



**UNIDO** works through 55 field offices in 172 member states, a network that keeps it in touch with all socio-economic contexts. This network enables to listen to problems on the ground and assess the challenges facing all types of commodity and value chain. This allows **UNIDO** to come up with effective programs and projects formulated with local input from policy, institutional and business levels.

The organisation ensures that its approach is holistic and inclusive, taking into consideration social and economic factors, as well as environment sustainability.

This approach has resulted in many successes in important sectors, such as fisheries, where **UNIDO'S** international track record speaks for itself. Based on need, **UNIDO** programs have helped to enhance industrial and human capacity in post-harvest handling, processing, marketing and export of fish and seafood products. This has improved value chains, rejuvenated artisanal fishing communities and helped nations to harmonize their quality control and inspection ability with the food safety regulations that need to be met for access to global markets. In addition, considering how fragile fishery resources have become over recent decades, **UNIDO'S** focus on the environmental sustainability of its programs is more vital than ever, as is collaboration with stakeholders at all levels.

### **UNIDO helps attain UN's Sustainable Development Goals**

**UNIDO'S** ISID-based programmes in the fisheries sector help to realise 12 of the United Nations' 17 Sustainable Development Goals directly, and contribute indirectly to the other five.

The 12 goals benefitting directly from **UNIDO'S** work are: no poverty; zero hunger; good health and well-being; gender equality; decent work and economic growth; industry, innovation and infrastructure; reduced inequalities; sustainable cities and communities; responsible consumption and production; life below water, and partnership for the goals.

**UNIDO'S** fisheries projects also contribute indirectly to the remaining five goals: quality education; clean water and sanitation; affordable and clean energy; climate action; life on land, and peace, justice and strong institutions.

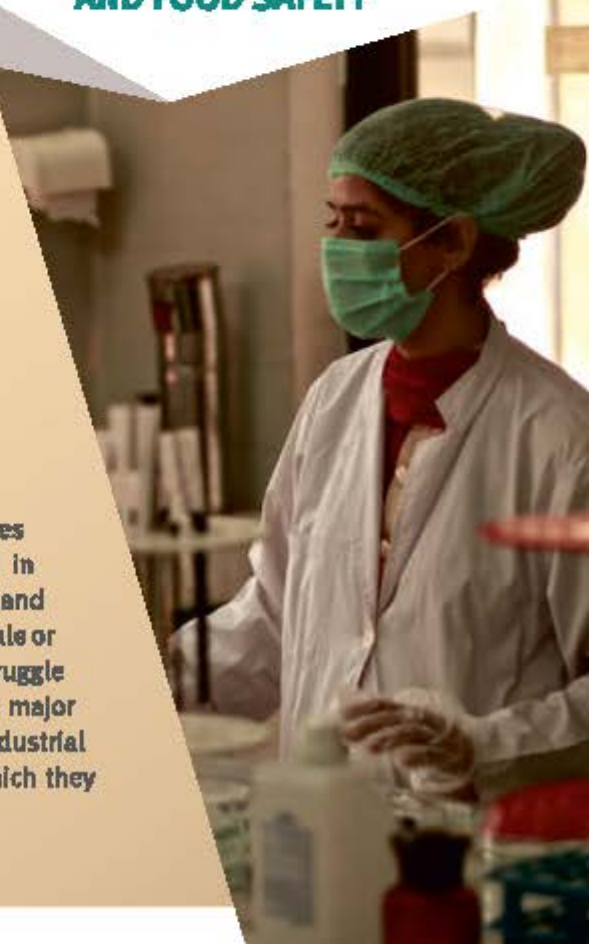
### **Fisheries for food security and food safety**

Both capture and culture fisheries are a source of food for millions – even the only source for many. They also provide livelihoods, thus contributing directly and indirectly to national food security. Fish also contribute indirectly to human nutrition in the form of fishmeal for aquaculture and poultry/livestock feeds.

Today, fisheries provide approximately three billion people with almost 20 % of their average per capita intake of animal protein, and a further 1.3 billion people with about 15 % of their per capita intake. Further, the Food and Agriculture Organization of the United Nations (FAO) estimates that by 2030, world fish production will have to increase to 187 million tonnes just to feed the global population of some nine billion people, the majority of whom will be found in less developed countries. In fact, 22 of the 30 countries where fish contribute more than one-third of the total animal protein supply were officially categorized as low income and food deficient countries (LIFDCs). The need for urgent action is patently obvious.

It is this knowledge that drives **UNIDO** to develop programs that address challenges such as indiscriminate fishing and farming practices which have resulted in declining fish stocks, an unsustainable environment, marginalisation of coastal and small-scale communities, and low incomes derived from harvest to the point of sale or export. Meanwhile, most processors and exporters in developing countries struggle to meet the increasingly stringent health and import regulations imposed by major markets such as the European Union. With **UNIDO'S** decades of expertise in industrial development, it is ideally placed to help fisheries and the communities in which they operate to meet these challenges, whatever the country, whatever the context.

### **FOOD SECURITY AND FOOD SAFETY**





## FISHERIES FOR GLOBAL MARKETS

**UNIDO's** approach to food safety is holistic. It seeks to improve every link of the value chain; from the initial raw product provided by fishing or harvesting, moving on to processing, packaging and labelling, storage and transport, and finally export. At all stages, it applies rigorous analysis to indicate what needs doing and how to do it most efficiently and effectively. Throughout, it maintains focus on the overall goals of improving businesses, increasing incomes and raising standards of living. In many of these initiatives, **UNIDO** has partnered with institutions from the private sector, regulatory authorities, multilateral organizations, and centres of excellence.

Food safety certification is often compulsory for access to global markets and this aspect is increasingly complex and confusing for would-be exporters in developing countries. In this compliance regime, food imports are being rejected for reasons such as the presence of veterinary drug residues, bacterial contamination, and mislabelling. Producers and processors who want to access global markets are thus under increasing pressure to ensure that their products are accompanied by the requisite food safety certificates.

## HOLISTIC APPROACH



For **UNIDO**, the solution lies in upgrading operations and strengthening quality infrastructures and their components, including those related to policy makers, regulatory authorities, conformity assessment bodies, testing laboratories and inspection and certification services.

Over recent years, **UNIDO** has successfully assisted more than 230 food processing enterprises and laboratories worldwide to become certified in accordance with international quality and food safety management system standards. At the country and regional level, **UNIDO** has supported countries such as Bangladesh, Egypt, Iran, Iraq, and Pakistan to overcome export bans for their food products in the European Union, the United States and other regulated markets.



## WEST AFRICA



### Improved market access for artisanal fisheries in West Africa

Faced with increasingly tough international trade barriers in the form of sanitary and phytosanitary standards (SPS), West Africa is setting its sights on retaining and expanding its access to global markets. Success depends on how well several challenges are addressed, including supply-chain and quality infrastructure limitations from the point of harvest through the value chain until the products are ready to be exported.

Despite sanitary and compliance improvements within the official technical and administrative framework, success would not be possible without the involvement of one of West Africa's most marginalized resources – its women. Time and experience have taught that women at grassroots level make as good business partners as men, if not better. In other words, empowering women is not only morally right, it also makes economic sense.

One of the targets of the **UNIDO** project for the region is therefore that companies will not only employ women to peel shrimp and fillet fish, but also as technicians and managers. Another highly anticipated indicator of success will be the creation of a pool of women entrepreneurs who will collaborate with investors to strengthen their own enterprises.

#### FAST FACTS

**Project:** Technical assistance on sanitary and phytosanitary (SPS) measures and the value chain to improve market access for artisanal fisheries in West Africa

**Objective:** To increase exports of artisanal products from West Africa to international markets, with full knowledge of SPS barriers and measures necessary to overcome them

**Value chain:** Variety of fish species, from artisanal fishers to wholesale traders and exporters

**Funding:** UNIDO and Standards and Trade Development Facility (STDF)

**Main partners:** REPAO, CAOPA, LEGAPESCA, Ministry for Animal and Fisheries Resources (Côte d'Ivoire), Ministry of Fisheries and the Maritime Economy (Mauritania), Ministry of Fisheries and Aquaculture (Guinea), and Ministry of Fisheries and Maritime Affairs (Senegal)

**Further details:** [www.unido.org](http://www.unido.org)

## Revitalizing the fishing and sea food processing industry in Sierra Leone

Sierra Leone is rebuilding after years of civil conflict left it near to ruin. Fisheries, once a major export earner, was badly hit both at artisanal and deep sea levels. Today, the key challenges remain the poor investment in the sector as well as the lack of management expertise and skilled labour. It has never been more urgent to build human capital so that Sierra Leoneans have the skills to chart their own course in fisheries.

Accordingly, a Fishery Training Institute (FTI) was established by **UNIDO** in March 2014. Sited in Freetown, the Institute focuses on training people to become deck officers, marine engineers, and specialists in radio communication and refrigeration, as well as in fishing gear technology. The new facility also provides tailor-made training courses for those employed by the fishing industry.

In addition, the Institute caters for the training needs of the authorities to ensure that at every point in the value chain, process managers are competent to see that international food safety standards are adhered to and all export regulations complied with. **UNIDO** will also work with the competent authority to see how best to maintain and improve the traceability of products, particularly as the waters of Sierra Leone continue to suffer intrusions by illegal, unreported and unregulated fishing fleets.

## SIERRA LEONE

**Project:** Revitalizing the fishing and seafood processing industry in Sierra Leone

**Objective:** To support the development of Sierra Leone's national capacity for fish and seafood processing through the training of skilled operators

**Value chain:** Human resources (management and skilled labour)

**Funding:** The Russian Federation

**Main partners:** Ministry of Fisheries and Marine Resources, Russian State Maritime University, Moscow State University of Technology and Management, Sierra Leone University.

## FAST FACTS

Social Inclusion

## CAMBODIA

### Safety of fish and fishery products for improved trade development in Cambodia

Export, not production is the main problem of Cambodia's fisheries sector. The annual value of fishery exports has been estimated to be as high as USD 100 million, but there are virtually no exports to such important markets as the USA and the EU, as well as major ones in Asia. And as health standards and quality control regulations in such countries continue to tighten and become more complex, Cambodia, with its current systemic deficits through the entire value chain, finds itself increasingly left behind.

But Cambodians are nothing if not resilient and today, almost four decades after the end of its devastating civil war, the country has one of the fastest growing economies in the region. A fisheries sector, developed sufficiently to meet export requirements, will help greatly in the ongoing industrialization of the country.

Because technical competence is a cornerstone of export capacity, a project was launched by Cambodia's Department of Fisheries Post-Harvest Technologies and Quality Control (DFPTQ) and implemented by **UNIDO** to improve quality and safety standards for fish and fishery products.

The main action areas include the following:

- Developing technical guidelines for improving processing, quality, packaging, and safety requirements
- Building the technical competencies of relevant government agencies, including the competent authority, throughout the value chain at all levels
- Improving the sharing of information related to post-harvest fisheries.

A major focus will be fishing communities at grassroots level, as well as small to medium-sized processors and traders.

## FAST FACTS

**Project:** Better quality and safety of fish and fishery products for improving fish trade development in Cambodia

**Objective:** To build food safety capacity and expertise, leading to increased access to domestic and international markets

**Value chain:** Fish and fishery products from harvest to inspection to ensure compliance for domestic and international markets

**Funding:** Trade Sector Wide Approach (SWAp), World Bank

**Successor Project:** Cambodia Export Diversification and Expansion Programme (CEDEP II): Export of Marine Fishery (funded by the Enhanced Integrated Framework, EIF)

**Main partners:** Ministry of Agriculture, Forestry and Fisheries

**Further details:** [www.unido.org](http://www.unido.org)



## Improving competitiveness of fishery value chains in Latin America and the Caribbean

Unity in diversity is at the heart of an innovative trade project involving several countries in Latin America and the Caribbean (LAC). The aim of **UNIDO's** program in this area is to foster regional integration, and to enhance productivity, competitiveness, and compliance with international quality and environmental standards along the shrimp value chains. Instead of competing with each other, Colombia, Cuba, Dominican Republic, Ecuador, Mexico and Nicaragua will trade with the world as an integrated whole in the farming, processing, marketing and export of shrimp.

This regional approach, guided by **UNIDO's** ISID focus, will bring about tremendous opportunities in four areas. Firstly, it will improve organizational and economic management in the value chain. This includes, for example, the introduction of new business models, the creation or upgrade of cooperatives and other associations, and enhances the building of partnerships

Secondly, it will improve the local production and supply of shrimp farming inputs through the application of new technologies for intensive and super-intensive shrimp cultivation. At the same time, it will enhance the physical infrastructure of farming ponds, ensuring the required capacity and conditions for cooling storage of the increased production expected.

Thirdly, it will strengthen the compliance capacity of quality and food safety management systems with national and international quality and food safety requirements such as Good Manufacturing Practices, SOP, EMS, HACCP, and Biosafety. The current and potential markets for shrimp products and related technical and quality and safety requirements will be analyzed. Marketing strategies will be developed both to consolidate and to increase exports of diversified products. Additionally, national inspection agencies will be supported in their efforts to improve.

## LATIN AMERICA AND THE CARIBBEAN





Fourthly, the environmental sustainability of the value chain will be improved through technical assessments and implementation of cleaner production; energy efficiency audits, and sustainable chemical management analyses.

**Project:** Improving productivity and competitiveness of shrimp value chains in Latin America and the Caribbean (LAC) through regional cooperation

**Objective:** countries - Colombia, Cuba, Dominican Republic, Ecuador, Mexico, and Nicaragua working together as a regional bloc to enhance the productivity and competitiveness of the shrimp export industry

**Value chain:** Farmed shrimp

**Funding:** UNIDO LAC Trust Fund and the OPEC Fund for International Development (OFID)

**Main partners:** Governments of Colombia, Cuba, Dominican Republic, Ecuador, Mexico, and Nicaragua

**Further details:** [www.unido.org](http://www.unido.org)

**FAST  
FACTS**

Economic  
Competitiveness

### Setting South Sudan's fishery sector on the path of sustainable economic growth

The vast and highly productive Nile River ecosystem in the Republic of South Sudan (RSS) harbours a significant, but unmeasured, amount of fish and supports a simple fisheries value chain. Development of the fisheries sector in South Sudan has a potential to create employment and improve food security.

A vibrant inland artisanal fishery exists around lakes, rivers and floodplains along the Nile corridor ecosystems and other resources across the country. Fishermen mainly use rudimentary methods without thought for the sustainability of fish, which as a result is a delicacy in high demand in South Sudan.

It is widely acknowledged that fishing communities are among the poorest and least resilient social groups. Their means of earning a livelihood are precarious and they make up a significant part of the severely food-insecure households in the country.

As the Government of South Sudan is embarking on consolidating peace, national security and reconstruction, the fisheries value chain presents a quick win sector for economic diversification. Bearing the national development and security challenges in mind, fishermen and other producers along the value chain, such as processors and traders, are faced with varied constraints and limited development opportunities for sustaining their food supply and earning their livelihoods.

The project, "Upgrading the Fisheries Sector in the Republic of South Sudan", began in June 2014 for completion in 2019. The ultimate outcome of the project is to "increase food security of children, men and women in targeted regions of South Sudan". This project addresses fishing communities and actors along the entire fisheries value chain, improving food security (in rural households, in particular), creating jobs and setting South Sudan's fishery sector on the path of sustainable growth.

## SOUTH SUDAN



## FAST FACTS

**Project title:** Upgrading the Fishery Sector In South Sudan, 2014-2019

**Objective:** Increased quantity of both fresh fish and fish products produced by fishermen, is available for consumption in targeted states, increased small-scale business development related to the fishery sector by women in selected fishing communities and improved fish resource management and delivery of services to the fishery sector by targeted institutions.

**Value chain:** Variety of fish species, including reef fish

**Funding:** Government of Canada

**Main partners:** Central level Ministry of Livestock and Fishery Industries (MLFI); State Level: Central Equatorial State (CES) and Eastern Equatorial State (ESS)

**Further details:** [www.unido.org](http://www.unido.org)

### Strengthening the national quality infrastructure for fish and fishery products in Bangladesh

The humble shrimp has given rise to a major fishing industry. With over 210 000 farms and more than 70 processing plants employing some 12 million people, the shrimp contributes over 4% of the GDP with annual export earnings of more than USD 650 million per year. But its prominent place in the economy has been hard won.

Only a few years ago, the key industrial challenges in Bangladesh included the lack of national capacity and quality infrastructure to overcome technical barriers to trade (TBT) and to comply with global food safety requirements, which are now basic prerequisites for market access. In 2005, the shrimp export industry was forced to take a huge step back when EU audits noted serious non-compliance in terms of official control systems and laboratory test results, particularly related to residues of antibiotics and other chemicals. Of concern to the sector was, and is, the fact that the EU is the biggest market for Bangladeshi seafood and shrimp.

Working closely with national authorities, **UNIDO** implemented the Bangladesh Quality Support Program (BQSP) and Better Work and Standards (BEST) Programs aimed at strengthening the national quality infrastructure for fish and fishery products to meet safety and quality requirements in export markets, improve competitiveness, and exploit international market opportunities, especially in the EU.

Focusing on aquaculture shrimp, the BEST-Better Fisheries Quality (BFQ) program has already brought about wide-ranging progress in the value chain from farm to fork, ultimately supporting economic growth and poverty reduction. Amongst the indicators of success are the lifting of the 20% testing requirement for Bangladeshi products at EU entry points, and the fact that Rapid Alert System for Food and Feed (RASFF) notifications have drastically reduced from 50 in 2009 to only one in 2014.

## BANGLADESH



### UNIDO Country Programs:

2005 – 2010: Bangladesh Quality Support Program (BQSP)

2010 – 2015: Better Work and Standards Program (BEST)

**Objective:** Strengthening the national fisheries quality infrastructure to enhance Bangladesh's economic competitiveness, ability to access global markets (especially the EU) and so contributing to economic growth and poverty reduction

**Value chain:** Aquaculture shrimp

**Funding:** The EU and NORAD

**Main partners:** (1) Ministry of Fisheries and Livestock (2) Department of Fisheries- Fish Inspection & Quality Control Divisions (3) Directorate of Drug Administration, Ministry of Health, (4) Ministry of Labour and Employment

**Further details:** [www.best-bfq.org](http://www.best-bfq.org)

**FAST  
FACTS**



## SUDAN



### Modernization of artisanal fisheries and creation of new market opportunities in the Red Sea State (Sudan)

A rich marine population inhabits the near-shore waters of the Red Sea State, the only one which borders the ocean. Artisanal fishermen work to feed their families, while small trawlers haul in their catches destined for sale in Sudan and its neighbours. Hardly any processing is carried out, nor formalized export trade recorded. **UNIDO** estimates the marine fishery economic potential to be between EUR 13 and 25 million per year, while the actual yield is thought to be only about 5 000 tonnes/year of finfish (FAO statistics). For now, the marine fisheries sector is unable to contribute much towards easing the nation's twin pressing issues of providing food and generating income.

But a start has been made and within the next decade, fisheries should be able to provide a future for the State. Baseline studies on fish, shellfish and reef fish stocks and distribution have been or are being conducted by **UNIDO** and the Norwegian Institute for Marine Research and with funding from Norway and Sudan.

A complementary project, funded by the then-Canadian International Development Agency (CIDA), now known as Department of Foreign Affairs, Trade and Development (DFATD), looked at enhancing the value chain from harvesting to marketing, and improving the livelihood of artisanal fishers. In addition, through a project launched in March 2015, **UNIDO** will work on strengthening institutional capacities and ensuring good governance of Sudanese fishery resources.

Several key action areas have already shown results in the formation of fishing cooperatives with trained staff and fishermen, and women's groups that operate small-scale businesses.

### UNIDO Country Programs:

Surveys of renewable marine resources in the Red Sea State, Republic of the Sudan (IMR/UNIDO)

Recovery of coastal livelihoods in the Red Sea State through the modernization of artisanal fisheries and creation of new market opportunities (DFATD/UNIDO)

**Objective:** Formulate strategies for the development of sustainable artisanal and small-scale fisheries and implement sustainable fishing for economic development

**Value chain:** Variety of fish species, including reef fish

**Funding:** Norway and Canada

**Main partners:** (i) Norwegian Institute for Marine Research (IMR) & UNIDO; (ii) DFATD/UNIDO, together with the Red Sea State Ministry of Agriculture and Animal Resources, Federal Ministry of Industry, Red Sea State Ministry of Economic Affairs and Investment

**Further details:** Recovery of Coastal Livelihoods in the Red Sea State of Sudan brochure. Published by UNIDO (2103). 16 pp.

**FAST  
FACTS**

## Sustainable market access through responsible trading of fish in Indonesia

With coastal areas straddling 13 000 islands and a fast-expanding aquaculture sector, Indonesia is one of the biggest seafood producers in the world in volume, though not in export value. But with the government now redoubling its efforts to revitalize the fisheries sector, it has become essential to restructure the entire value chain, from sustainable management of resources up to export. Every step toward equitable access to information and resources is another step towards fuller realization of the country's fisheries export potential.

The key requirement is to bridge knowledge gaps at artisanal level and then upwards through the public and corporate sectors. This is one way in which the **UNIDO** "Sustainable Market Access through Responsible Trading of Fish (SMART-Fish) Indonesia" program seeks to support these initiatives. Over a five-year period, SMART-Fish Indonesia has been developing a comprehensive package of activities and services, implemented together with the Ministry of Trade (MoT), the Ministry of Industry (MoI), the Valcapfish Center and the Fisheries University in Jakarta.

Specifically, SMART-Fish Indonesia looks at strengthening the trade capacities of three selected value chains: namely pole and line and hand line tuna/skipjack; pangasius farming, and seaweed farming, while promoting the sustainable use of fisheries resources. These value chains were specifically selected according to the following factors:

- Their relevance to capture and culture fisheries
- Socio-economic sustainability potential among low-income groups and women
- The potential to replicate good practices by wider communities
- Their potential for resource efficiency and waste reduction.



**INDONESIA**

### FAST FACTS

**Project title:** Sustainable Market Access through Responsible Trading of Fish in Indonesia (SMART-Fish Indonesia)

**Objective:** Inclusive and sustainable development of Indonesia's fisheries

**Value chains:**

- Pole & line and handline tuna/skipjack (East Nusa Tenggara)
- Pangasius farming (Jambi & East Java)
- Gracilaria & E. cottonii seaweed farming (East Java & South Sulawesi)

**Funding:** Switzerland's State Secretariat for Economic Affairs (SECO)

**Main partners:** Ministry of Marine Affairs and Fisheries (MMAF)

**Further details:** [www.smart-fish-indonesia.org](http://www.smart-fish-indonesia.org)

**UNIDO's** fisheries programs are worldwide in coverage and span industry, food safety, and capacity-building. Here are some examples of successful programs.



## CASE STUDIES



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