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# Driving Innovation and collective action in Indonesia's fish value chain

*Reducing food loss and making nutritious food more available and affordable*

**Reducing food loss in Indonesia is key to ensuring greater access to safe, nutritious food for local people**

**With significant losses of nutritious fresh fish, food loss is a big challenge in Indonesia.** Indonesia is ranked second in the world for food loss<sup>1</sup>, suffering a yearly loss of approximately 13 million tons<sup>2</sup>, equating to 300 kg per person per year and comprising about 20% of agricultural crops and 30%<sup>3</sup> of fisheries products.

Despite their abundance in Indonesia, loss of fresh fish is a particular problem. Government and expert research estimates that between 20 – 35% of fish is lost annually, representing 75,000 – 125,000 MT of fish in the domestic supply chain<sup>4</sup>.

**The loss of protein and micro-nutrient-rich foods like fish on this scale reduces availability of safe and affordable nutritious food for the local population, contributing to high rates of malnutrition and harming livelihoods.** GAIN estimates that the annual loss of fresh fish equates to 16,500 – 27,500 MT of protein, which is equivalent to the daily needs of 2.7 – 4.4 million children in Indonesia. For example, 100g of mackerel tuna contains between 56% and 100% of

the recommended protein intake for an adult and for a child 4-9 years old, respectively. Moreover, fish is an important source of micronutrients, minerals and essential fatty acids, including Omega-3.

This is significant given that Indonesia lags on several global health indicators. For example, 21% of children under the age of 5 years<sup>5</sup> are stunted (short height for age) and nearly 7%<sup>6</sup> suffer from wasting (low weight for height), both of which are caused by chronic malnutrition.

Food loss also has an economic impact. Less availability combined with higher costs of production due to loss likely means that consumers end up paying more. And with fish losses in Indonesia worth USD135-226 million<sup>7</sup> annually, livelihoods are being harmed and a significant commercial opportunity is being missed by the fishing sector.

## **GAIN insight**

*Bringing together stakeholders along the fish value chain in Indonesia to co-develop innovative solutions and share insights to reduce post-harvest loss and make nutritious, fresh fish more available and affordable.*

**Postharvest Loss Alliance for Nutrition (PLAN)**

**gain**  
Global Alliance for  
Improved Nutrition

## The root causes of fish loss are multiple and complex, and many stakeholders have a role to play in finding solutions

***Inadequate cold chain infrastructure and poor handling practices lie at the heart of postharvest losses in Indonesia's domestic fish value chain.***

Although the highest proportion of fish losses arise from un-wanted or illegally caught fish discarded by fishermen, an estimated 25 – 30% of fish are lost post-harvest.

This is mainly due to poor handling practices and cold chain facilities (refrigerated storage and transportation) needed to keep fish at the right temperature to maintain freshness and nutritional content as they move through markets and processing factories before reaching consumers.

While large companies catching and processing fish for international and domestic markets have the resources to invest in their own cold chain infrastructure, smaller-scale fisherman, wholesalers and food processors and retailers supplying for domestic consumption have had to rely on ice to keep fish at the right temperature, which is inefficient, costly and distrusted by consumers.

***The lack of good handling practices and refrigerated cold-chain infrastructure to prevent loss has meant that the significant potential of Indonesia's domestic fish market has not been fully realised.*** A lack of cold storage and transportation infrastructure and inefficient logistics make it expensive to move fish to market and result in poor product quality. Publicly funded cold storage infrastructure in fish markets is limited and unreliable, especially in fishing centres outside urban areas. The situation is compounded by the fact that most fish originates on the east side of the islands but needs to travel to the major markets on the west side. Indonesia currently has cold storage capacity for only 500,000 tons of seafood, while it needs to be able to support at least 15.5 million tons of fish produced in 2020<sup>8</sup>.

Government policy has also only recently started to actively harness the nation's abundance of fish to address national health and nutrition priorities.

Alongside the lack of a supportive policy environment, micro- and small-scale businesses along the fish value chain need to contend with limited availability of affordable and appropriate cold chain and food processing solutions, which offer a viable alternative to ice. One factor contributing to this gap is the lack of a dynamic domestic cold chain technology sector. Larger businesses have historically opted to buy solutions developed overseas, and small domestic companies



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*A lack of cold storage and transportation infrastructure and inefficient logistics make it expensive to move fish to market and result in poor product quality.*

with promising technologies have lacked access to investment, markets and advice to bring scalable solutions to market.

***Despite the abundance of fish, lack of consumer demand has also been a barrier.***

On the demand-side, despite its rich resources, fish consumption in Indonesia is low. Historically, consumers have hesitated to purchase fish due to the perceived complexity of buying it, getting it home before it starts to spoil and preparing it.

***The under-developed and fragmented nature of the domestic fish value chain in Indonesia and the complex array of challenges in developing commercially viable cold chain and food processing technologies at scale have meant that the potential of fresh fish to fill a gap in local diets as an affordable, nutritious food has remained largely un-exploited-until recently.***

## PLAN Indonesia has played a key role in reducing loss and increasing demand for fish by bringing together different sectors to co-create and scale cold chain, processing and product innovations

Recognising that the problem of food loss in the fish value chain cannot be tackled in siloes and requires coordinated action, the **Indonesia Postharvest Loss Alliance for Nutrition (I-PLAN)** was created in 2018 to bring together the expertise and resources of the Global Alliance for Improved Nutrition (GAIN), the Ministry of Health, Ministry of Marine Affairs and Fisheries and a diverse range of business, academic and civil society organisations.

From the outset, I-PLAN set itself three objectives:

- to improve the domestic supply of nutritious food by reducing postharvest losses of fresh fish
- to increase access to improved postharvest technologies and best practices and enable businesses to take advantage of market opportunities
- to bring together key stakeholders to align resources and know-how on reducing food loss.

I-PLAN's design phase identified the need for interventions in transport, distribution and retail, where the majority of fish is lost, and the opportunity to focus on promoting locally developed cold chain innovations and to align with existing government initiatives aimed at strengthening the fish supply chain and promoting fish consumption. These include the Ministry of Health's "Healthy Lifestyle Movement" and the Ministry of Marine Affairs and Fisheries "Eat More Fish Movement".

### **I-PLAN has focused on two primary activities to achieve its objectives:**

**The Alliance (JP2GI):** Following its initial success, the I-PLAN Alliance was established as a national independent association in 2019 and re-named JP2GI, with GAIN continuing to support the organisation's operations and development. Over the last year, GAIN has worked to build JP2GI's capacity to sustain itself through grant proposal writing and financial and in-kind contributions from its members.

JP2GI now provides a long-term platform for the Ministry of Marine Affairs and Fisheries, Ministry of Health, fishermen, nutritionists, distribution, processing and retail businesses, cold chain technology companies, industry associations and academic organisations to work together to reduce postharvest fish loss and increase availability and affordability of



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*I-PLAN's design phase identified the need for interventions in transport, distribution and retail, where the majority of fish is lost.*

fish to improve community nutrition. It also coordinates action to strengthen consumer demand for fresh fish and fish-based products (ready to eat, ready to cook) to improve local diets, with the Ministry of Health represented in a non-official, liaison capacity.

JP2GI fosters the development of innovative cold chain solutions and fish-based products, and supports capacity building, including technical training and access to international cold chain and food processing industry expertise. It also hosts regular networking meetings for members.

In addition, it has established partnerships with local financial institutions to facilitate greater access to finance and investment for member businesses. It also provides a forum for research and the development of policy to strengthen the enabling environment for reducing postharvest loss.

JP2GI has now grown to more than 500 members, the majority being small and medium-sized businesses.

“ **Each location has different issues and requires different solutions. JP2GI initiates studies, gathers local innovations and engages multiple stakeholders to reduce food loss and waste to improve nutrition.** ”

DR. SOENAN HADI POERNOMO, *Chairman of JP2GI*



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### **I-PLAN Business Innovation Challenge:**

Following recommendations<sup>9</sup> for I-PLAN to focus on fostering and scaling cold chain and food processing innovations that increase the availability of fresh fish to consumers by preventing postharvest loss, I-PLAN established a successful Business Innovation Challenge competition. Participating small businesses with promising technologies receive seed funding, technical support and access to networks, potential sources of investment and market opportunities.

In 2018, the focus of the competition was on cold chain and food processing technology innovations. In 2019, the emphasis shifted to supporting businesses developing ready-to-eat and ready-to-cook fish-based products that use unique processing methods to reduce loss.

The winner in 2018 was Cold Bank Maslaha, which has developed technology that replaces ice as a means to preserve perishable foods. Since the competition, the company has received grant funding for the purchase of equipment and technical and business training and mentoring. The company has subsequently received investment to build a new factory and has signed a memorandum of understanding with the Indonesian Cold Chain Association and an Indonesian railway association to preserve fresh and frozen goods deliveries by rail.

In 2019, I-Fit Fish Cereal, a producer of nutritious fish-based cereal, was named the competition winner. The company has since received technical support and grant funding, in addition to securing distribution with local retailers. The company's sales have grown quickly, increasing by 8,350 boxes from January to July 2020 and generating revenue of IDR 170,600,000 (USD 1,135).

**I-PLAN Indonesia has built the foundations of a sustainable, locally owned platform to increase greater access to safe, nutritious fish, with the potential for replication in other agri sectors**

**I-PLAN has either met or exceeded all targets that were set when the initiative was established in 2017. Notable achievements include:**

- Signing more than 500 organisations to join the platform
- Training over 300 individuals on improved postharvest loss practices and technologies
- Helping over 100 businesses apply improved postharvest loss practices and technologies in their businesses
- Identifying over 500 postharvest loss innovations

I-PLAN has also demonstrated the value of such platforms in helping to catalyse multi-stakeholder collaboration and solutions that address the complex root causes of postharvest loss in Indonesia's food system, which prevent local populations from accessing affordable, safe nutritious food.

One of the most notable achievements of the platform has been to strengthen collaboration between the Ministry of Health and the Ministry of Marine Affairs and Fisheries, creating stronger alignment and coordination between fisheries and national health and nutrition policy priorities.

With robust foundations now in place, JP2GI is looking to replicate its success in other nutritious agri-food sectors, which also experience high levels of postharvest loss, such as fresh fruits and vegetables.

#### **ENDNOTES**

- 1 2017 Food Sustainability Index, Economist Intelligence Unit (EIU)
- 2 World Resources Institute and the World Business Council for Sustainable Development, 2018
- 3 McKinsey Global Institute, The Archipelago Economy: Unleashing Indonesia's potential (2012)
- 4 Dalberg landscape analysis on fish loss in Indonesia, 2017
- 5 Food Systems Dashboard (<https://foodsystmsdashboard.org>)
- 6 Food Systems Dashboard (<https://foodsystmsdashboard.org>)
- 7 Dalberg landscape analysis on fish loss in Indonesia, 2017
- 8 Indonesia Cold Chain Association, 2019 ([www.arpionline.org](http://www.arpionline.org))
- 9 Dalberg study and postharvest loss study in East Java done by Koperasi Artha (MMAF)

**“I-PLAN’s strategic initiatives fully complement MMAF programmes and activities to ensure a strong national fish supply and improve public nutrition through increasing access to fresh, nutritious fish.”**

ARTATI WIDIARTI, *Director General of Marine and Fisheries Products’ Competitiveness, Ministry of Marine Affairs and Fisheries*



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