

Impact Story 2:

REDUCING POST CAPTURE FISH LOSSES IN INDONESIA: I-PLAN

THE OPPORTUNITY

The return to every 1 Indonesian Rupiah invested in nutrition interventions in Indonesia is 48 Rupiah (0.0032USD).¹ Despite this very high benefit-cost ratio, nearly one third of Indonesian children under 5 years old are stunted.² This has profound implications for their individual development and for the country's development. One of the factors driving this high level of undernutrition is poor quality diets. UNICEF notes that over 50% of infants and young children in Indonesia do not receive a minimum diverse diet. Women are affected by undernutrition too: more than **30%** of Indonesian women are anaemic and this percentage is rising.³ Promoting diverse diets is a vital way to prevent undernutrition.

Fish is an excellent source of vitamins and minerals. Indonesia has one of the highest fish supplies in the world at **121g**⁴ per person per day, twice the level of the USA.⁵ Fish in Indonesia is also inexpensive (relative to cereals) compared to countries such as Bangladesh, Pakistan and Vietnam.⁶ Yet **35%** of fish in Indonesia is lost or wasted between harvest and markets due to poor transport and storage infrastructure and practices.

The Need	The Losses	The Nutrition Impact
 <p>Pre-school age children need 17-20g of protein per day</p> <p>Pregnant women need more than 20g of protein per day.</p>	<p>Fish holds 22g of protein per 100g</p>  <p>Indonesia's domestic supply chain: 75,000–125,000 MT of fish lost annually = 18,500–27,500 MT of protein lost annually = US\$ 135 – 226 million lost annually</p>	<p>Protein supply loss equivalent to the daily needs of 2.7–4.4 million children</p>  <p>Reducing perishability is also required to help ensure supply is available all year round.</p>

Essentially, an excellent and affordable source of nutrients – fish – is lost or wasted when it could be consumed by infants, children and women thus contributing to significant reductions in undernutrition in the country.

Figure 2: The premise of I-PLAN

THE SOLUTION

In 2018 GAIN began work in collaboration with the District Fisheries Offices of Indonesia's Ministry of Maritime Affairs (MMAF) to develop the Indonesia Postharvest Loss Alliance for Nutrition (I-PLAN). **I-PLAN** aimed to improve the domestic supply of fish by reducing post-harvest losses.

The project consisted of two main activities: (1) establishing a platform for collaborations between actors of the fish supply chain and improving efficiency and productivity of its members via training, business matching and seed funding and (2) innovation challenges for local businesses on cold chain technology and fish-based food innovations.

Over 200 of JP2GI's⁷ members have applied improved postharvest loss technology and practices to their fish businesses, with over 20,000 cold chain technology products sold and used by 400 fishers to allow 56,000 additional fish-based food products to be sold in local markets.



Figure 2: Winners of the 2019 I-PLAN Innovation Challenge

1 <https://globalnutritionreport.org/reports/2014-global-nutrition-report/>

2 Stunting is the impaired growth and development that children experience from poor nutrition, repeated infection, and inadequate psychosocial stimulation. Children are defined as stunted if their height-for-age is more than two standard deviations below the WHO Child Growth Standards median

3 <https://globalnutritionreport.org/resources/nutrition-profiles/asia/south-eastern-asia/indonesia/>

4 <https://ourworldindata.org/grapher/fish-and-seafood-consumption-per-capita>

5 <https://globalnutritionreport.org/resources/nutrition-profiles/asia/south-eastern-asia/indonesia/>

6 <https://foodsystemsdashboard.org/compareandanalyze>

7 **Jejaring Pasca Panen untuk Gizi Indonesia (JP2GI)** - Post-Harvest Network for Indonesian Nutrition

THE IMPACT

Strengthening the ecosystem: I-PLAN facilitated cross-sector dialogue by convening academics alongside private- and public-sector actors and catalysed the exchange of knowledge and information, which all stakeholders interviewed deeply appreciated. Faculty members from local universities reported that meeting new private-sector players through the Alliance had allowed them to adapt their coursework to reflect a more practical lens. Through member WhatsApp groups, fish sellers in one market were introduced to those in other markets, and these sellers frequently exchange information with each other—on post harvest loss (PHL) reduction as well as other topics (for example, where they might purchase fish, given price and availability in different locations).

Facilitating inter-Ministerial collaboration: I-PLAN provided a platform for Indonesia's Ministry of Health and the MMAF to collaborate more effectively on increasing the production and consumption of fish, setting a precedent for inter-ministerial collaboration in Indonesia. As a result of I-PLAN's coordination and advocacy, there has been increased Indonesian government action to address fish PHL issues, including training delivered by District Fisheries Offices to fish supply-chain actors on post-harvest management and government procurement of PHL- reduction technologies.

Surfacing and scaling local innovations: The business innovation challenge succeeded in surfacing four local innovations for PHL reduction in the informal and small-scale parts of the fish supply chain.

The first set of innovations generated by I-PLAN

- **Maslaha:** A re-freezable plastic ice pack to replace ice for cooling, which sold more than 20,000 cold banks to 400 fishermen and other users (such as lactating mothers, street food vendors, and vaccine-carrying health workers) between June and December 2019.
- **CoFresh:** A fish storage and display unit for motorbikes of last-mile sellers, to replace existing Styrofoam storage boxes.
- **Prominator:** A cooling attachment towed by three-wheeled motorbikes to maintain the cold chain for fish deliverers.
- **Coolla:** A fibreglass storage box and cooling system, similar in function to a portable refrigerator

Local innovation was a key priority for the government.

To do this, I-PLAN engaged with non-traditional entrepreneurs (for example academics, value chain actors, and government employees), thereby tapping into a generally under-explored pool of innovators in the country. Three of the four BIC winners were not traditional entrepreneurs.

Reducing energy use: We undertook cost benefit modelling for the Maslaha Cold Bank, the winner of the first business BIC. It develops an energy efficient and reusable ice substitution process. Even if with no reduction in fish loss (which there was: up to 20%), the benefits of investing in this product are IDR 12.6 billion (760,000 USD) over 3 years, assuming all 400 fish traders who bought the product and joined the pilot program in 2019 keep using the product for the next 3 years. Testing showed that the product could reduce electricity cost for freezing, reduce the use of plastic to wrap ice, and save ice purchasing costs. The median cost of generating this benefit was 120,000 USD for a Cost Benefit Ratio of 6:1.



Figure 2: Fish handler demonstrating one of the winning innovations, Maslaha, a reusable ice pack for keeping fish cool

“There are other innovation challenges, but this one has helped to scale up, which makes it attractive”

Business Innovation Challenge participant

A sustainable initiative: After its initial development phase, the **I-PLAN** Alliance in Indonesia was re-named JP2GI and now runs independently, comprising more than 600 fish supply chain members across Indonesia. The Ministry of Health and the Ministry of Maritime Affairs have also recently signed an agreement—**independent of GAIN and I-PLAN**—to promote excellence in Indonesian human capital through increased fish consumption.

International recognition: Dubai Expo, 29 March 2022: The Indonesia Postharvest Loss Alliance for Nutrition (**I-PLAN**), an innovative initiative founded by GAIN with support by the Ministry of Foreign Affairs of the Kingdom of the Netherlands, was recognized by winning the Best Practices Award in Sustaining Urban Food Systems from the Dubai International Award for Best Practices.



Figure 5: Aang Sutrisna and Teale Yalch of GAIN at the Dubai 2022 Expo



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