Partnership with Private Sector:

a Path to Combat Iodine Deficiency through Universal Salt Iodization in Indonesia
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EXECUTIVE SUMMARY

Indonesia has a high risk of Iodine Deficiency Disorder (IDD) with approximately 86.5 million of the population at risk for IDD\(^1\). Accordingly, Indonesia has been at the forefront of the Universal Salt Iodization (USI) movement since the 1980s, when the prevalence of goitre was identified.

Nutrition International (NI) Indonesia works to improve the health and well-being across Indonesia. One of NI’s priority objectives is to increase the number of households consuming adequately iodized salt. Since 2009, NI has implemented Accelerated USI Program to support the Government of Indonesia (GOI) to reach USI by 2018.

World Health Organization (WHO) recommends USI to address iodine deficiency. Salt is the best medium to supply iodine. It is effective, inexpensive and commonly consumed by all, including those belonging to the lower socio economic strata as well as those prone to IDD. The main goals of the Accelerated USI program are:

- To increase the availability of domestically-produced quality iodized salt.
- To reduce non-iodized salt in West Nusa Tenggara province and the eastern part of Indonesia.

This case study aims to explain one of the two goals of NI’s Accelerated USI program - to increase the availability of domestically-produced quality iodized salt in the market. It defines the strategy, process, challenges, and success of the program (2009-2016). Funding from the Canadian government supported the partnership between NI and Sumatraco – a large private salt processing company in East Java Province. NI provided extensive technical assistance to upgrade their iodization equipment and Sumatraco invested in the purchase of machinery, land and buildings.

The NI and Sumatraco partnership resulted in approximately a 300% increase in the production capacity of the plant i.e. an additional 60,000 Metric Tonnes (MT) annual production of quality iodized salt at the end of 2016. This increase in production helps to protect 20 million Indonesians against IDD\(^2\), including 3.6 million school age children 5-14-year-old and 4 million women of reproductive age 15-39-year-old\(^3\). Sumatraco is committed to maintaining the quality of salt and has planned to increase production capacity by setting up several new factories based on NI designs in Central Java. This would result in an annual increase in total production capacity from 80,000 MT to 400,000 MT\(^4\). Strong trust and commitment, dedication, continuous supervision and open communication were fundamental to the success of this partnership.

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\(^1\) NI’s Operational Strategy, Universal Salt Iodization IDD Program, Indonesia.
\(^2\) Salt consumption in Indonesia: 9.9g/capita/day or around 3 kg per annum (based on government estimates of requirements for household and food processing salt).
\(^4\) Currently Sumatraco owns four factories in East Java and two in West Java.
The total cost for this partnership was USD2.8M – USD0.3M from the Canadian government through NI in the form of technical assistance and USD2.5M from Sumatraco.

**INDONESIA AT A GLANCE**

Indonesia, the world’s largest island country and the fourth most populous country in the world with approximately 250 million people. A majority of the population is under 24 years old5.

**National salt supply and demand.** In Indonesia salt is produced by evaporation of seawater. The long rainy season and high humidity negatively affect salt production. Hence to fulfill the national demand for salt, Indonesia produces and imports salt from Australia and India6.

In 2010, the national demand for raw salt was around 3 million MT per annum. 1.8 million MT (60%) is for industrial use and 1.2 million MT (40%) is for human consumption purposes. Industrial use of raw salt is as caustic soda and for leather tanning while at the domestic level it is used for household and livestock consumption, food processing, fish curing and salting.

The national demand for salt increased by an average of 1.6 per cent per annum between 2007 and 2017. In 2015, 56% of the national salt supply was imported. High-quality salt was imported mainly from Australia and lower quality salt from India (Gujarat)7.

To reduce dependency on salt imports, in 2010 the Ministry of Marine Affairs and Fisheries (MoMAF) launched the People’s Salt Empowerment Program - also known as Pemberdayaan Usaha Garam Rakyat (PUGAR) - to support domestic salt farmers6. PUGAR’s goal is to improve the livelihood of small-scale salt farmers by improving the production and quality of domestic raw salt. PUGAR gained significant achievements in the production of raw salt with almost three million MTs produced in 2015; however, majority of the salt produced was of a lower quality – K2 quality8 - with higher moisture content.

Salt processors who purchased this raw salt from farmers had to bear losses of 20% in volume occurring during the washing process. This supply of poor quality salt led to no progress in achieving self-sufficiency in industrial salt, hence the industry is still allowed to import higher quality raw salt10.

**Government of Indonesia’s commitment to USI.** The GOI has passed various regulations and decrees on iodized salt. In 1985, the government strengthened the coordination of iodized salt production through an agreement between four ministries; the Ministry of Industry, the Ministry of Trade, the Ministry of Health, and the Ministry of Internal Affairs11. This was followed by a regulation on iodized salt requirements from the Ministry of Health in 198612. In 1994, GOI released a Presidential decree13 requiring all salt consumed by humans and livestock, salting of fish and food

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7 Ministry of Industry, BPS 2015
8 MoMAF Regulation No. 21/MEN/2010.
9 The Indonesia salt industry categorizes salt as K1, K2, and K3 to indicate quality, with K1 as the highest quality and K3 as the lowest. There are no specific criteria for this categorization beyond the following, which is stipulated in the Decree of the Minister of Industry and Trade 369/MMP/KEP/5/2004 on Provisions on the import of salt: “Salt K1 complies with the Indonesian National Standard (SNI) for salt as raw material, while Salt K2 and K3 do not fulfill the requirements of SNI but maybe processed in K1 or used for other assorted industrial needs or consumption”.
12 Regulation of the Ministry of Health No. 165/Men.kes/SK/B/II/1986 on requirements of Iodized Salt
13 Presidential Decree No. 69 Year 1994 on the procurement of Iodized Salt.
processing to be iodized. As a result, in 1995 almost 50% of all households consumed iodized salt.

Since then the incremental increases in iodized salt coverage have been relatively small and at the end of the millennium, Indonesia did not reach USI. The National Basic Health Survey (Riskesdas) reported the coverage of iodized salt at the household level nationally to be 92%. The GOI is working diligently to reach USI in 2018.

Risks of Iodine Deficiency Disorders (IDD). Iodine, a micro mineral essential to the proper functioning of the thyroid gland. It is required for the synthesis of thyroid hormones necessary for growth, intelligence, and body development.

Intake of iodine below the recommended amount affects the synthesis of thyroid hormones by the thyroid gland resulting in IDD\(^{14}\). IDD affects infants, children, teenagers, and adults. Pregnant women and children are affected the most.

The fetus depends on the mother for the supply of thyroid hormone. A deficiency leads to mental and motor function impairments, cognitive disorders, and increases the risk of infant morbidity\(^{15}\). The most common effect is permanent mental disorders that disrupt intellectual capacity and impairs competitiveness at work, ultimately increasing the risk of the vicious cycle of poverty.

Universal Salt Iodization (USI) movement. According to WHO, IDD is the world’s most prevalent yet easily preventable cause of mental impairment and other neuro-cognitive disorders. This led to a worldwide USI movement to eliminate IDD\(^{16}\). Salt is one of the best mediums to supply the recommended iodine intake due to its affordability. People commonly consume salt daily, including the poor and most
vulnerable to IDD. The body requires 150 micrograms\(^17\) or 5 gram of iodized salt per day\(^18\). Iodine must be supplied through food and drink since it is not produced by the body. Globally, it is estimated that around 2 billion individuals suffer from iodine deficiency, with South Asia and sub-Saharan Africa as the most impacted regions\(^19\). The global target for USI is for at least 90% of households to be consuming adequately iodized salt.

Consumption of adequately iodized salt at the household level.

Large salt processors prefer to buy high-quality raw salt to avoid losses during processing. There is an excess of low-quality raw salt from salt farmers who try to sell it directly to the market unprocessed and non-iodized. It is suspected that this is the reason for the circulation of low-quality salt in the market, especially in salt producing provinces, leading to an increased consumption of non-iodized salt\(^20\).

In 2013, the National Basic Health Survey (Riskesdas) reported the national coverage of iodized salt at the household level to be 92\(^21\) (except for expectant mothers in poor families in West Nusa Tenggara). The body requires 150 micrograms of iodine per day\(^17\) or 5 gram of iodized salt per day\(^18\). Iodine must be supplied through food and drink since it is not produced by the body. Globally, it is estimated that around 2 billion individuals suffer from iodine deficiency, with South Asia and sub-Saharan Africa as the most impacted regions\(^19\). The global target for USI is for at least 90% of households to be consuming adequately iodized salt.

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\(^21\) Measured using Rapid Test kit.
Tenggara, East Nusa Tenggara, Maluku, Papua, and East Java). However, a significant proportion of this salt is not adequately iodized (less than 15 ppm iodine). Comparison of National Basic Health Survey (Riskesdas) 2007 and 2013 (measured using titration\textsuperscript{23}) results showed that household consumption of adequately iodized salt (i.e. with iodine content of 30 ppm or more) declined slightly from 63\% (2007) to 55\% (2013)\textsuperscript{23}. In other words, 45\% of all households or about 112 million Indonesians are at risk of IDD\textsuperscript{24}, including:

- 20 million school-age children (5-14 years)
- 23 million women of reproductive-age (15-39 years)

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure3.png}
\caption{Households Consumption of Iodized Salt Trend (Titration Method)\textsuperscript{25}}
\end{figure}

\textsuperscript{24} Riskesdas 2007 and 2013.
\textsuperscript{25} Business model development: Grouping and organizing Lombok salt farmers into collectives like Self-Help Groups (SHGs) and cooperatives to demonstrate models of self-reliance among the salt farmers.
**NI’S STRATEGY TO SUPPORT USI IN INDONESIA**

**Accelerated USI Program**: Since 2009, NI has supported the GOI to reach its aim of USI by 2018 via the Accelerated USI Program (Figure 4). NI’s main goal is to increase the availability of domestically-produced quality iodized salt and reduce non-iodized salt availability in West Nusa Tenggara province and the eastern part of Indonesia. NI strategically focuses on the supply of iodized salt considering that consumption of iodized salt largely depends on its market availability. Interventions on the demand side by an iodized salt consumption campaign would be futile if the market only offers non-iodized salt or salt with insufficient iodine content. The ideal solution is to ensure that quality iodized salt is readily available in the market ensuring that the public lack alternatives and thus are protected against IDD.

NI implemented the USI Acceleration Program with three strategies:
- Improving quality control and quality assurance of small and mid-scale salt processors in Java.
- Improving production technology and efficiency by upgrading iodization equipment in large-scale salt processors in East Java.
- Continuing the iodization of raw salt programs in Bima and Lombok (West Nusa Tenggara province) and developing a business model in Lombok.²⁶

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*Figure 4. NI’s Accelerated Universal Salt Iodization Program*
UPGRADING IODIZATION EQUIPMENT OF LARGE SALT PROCESSORS

I collaborated with two stakeholders in the iodized salt industry: the Ministry of Industry and the Iodized Salt Producers’ Association (APROGAKOB), and began the program by:

- **Identifying large salt processors**: There are 304 salt processors across 21 provinces in Indonesia. Of these, there are 11 large-scale salt processors with a production capacity greater than 5,000 MT per annum. These large salt processors account for 65-70% of the total production of iodized salt thus playing a vital and strategic role in standardising the iodized salt supply in the Indonesian market.

- **Holding an introductory workshop in 2009**: This workshop was attended by the 11 large scale salt processors. It aimed to explain the importance of adequately iodized salt for public health, identify information on the salt processors’ needs and build a commitment to increase the quality and production of iodized salt.

- **Evaluating the shortcomings of salt processors to produce quality iodized salt in 2010**: Five salt processors volunteered to participate in a five-month assessment to calculate capital investment needed to upgrade the equipment. The investment needed to achieve the desired efficiency factor ranged between USD 400,000 - 500,000 excluding land and building investment. The high investment resulted in two of the five salt processors participating in the assessment - PT Sumatraco Langgeng Makmur (Sumatraco) and PT Susanti Megah (Susanti).

- **Commencing technical assistance in 2012**: Susanti had the capacity to upgrade their equipment and needed assistance only up to the general arrangement drawing. Technical support provided to Susanti was completed within the same year. The technical support for Sumatraco yielded a mutually beneficial partnership which lasted until January 2016.
CASE STUDY: PT SUMATRACO – IMPROVEMENT OF QUALITY IODIZED SALT PRODUCTION

Sumatraco’s capacity prior to intervention: In 2010, the production capacity of Sumatraco was 20,000 MT per annum, consisting of granular and brick salt marketed in Sulawesi, Nusa Tenggara, Kalimantan, and Papua. Sumatraco realized that their inefficient and obsolete production technologies, facilities, layouts, production processes and equipment led to sub-par product quality. The Memorandum of Agreement (MOU) was signed between the two parties in 2012 based on mutual benefits. While adequately iodized salt was meant to achieve NI’s vision to increase mineral intake among those prone to IDD, the technical assistance was then required by Sumatraco to increase production capacity and quality, leading to increased revenues and profits.

Constructing a new plant with an increase of 300% in production capacity: Sumatraco agreed to implement NI’s recommendation to build a new salt processing plant with the capacity of 60,000 MT per annum. NI provided technical assistance by designing and estimating the investment for a new salt processing plant including washing, drying, grinding, brine treatment, iodization, the packaging facility and warehousing (Figure 6). Sumatraco provided the investment for machinery, land and building.

Construction and Installation Stage. The two main challenges during the construction and installation stage were the procurement of qualified consultants for each stage and timely release of the investment fund schedule. NI assisted Sumatraco through the entire process of the new plant development, including:

![Production Flowchart]

Figure 6. Production Flowchart Diagram
Facility design and revisions: When finalising the facility design, Sumatraco and NI agreed to reduce the production rate from 15-20 MT per hour to 10 MT per hour to ensure production of food grade iodized salt and still achieve the targeted capacity of 60,000 MT per annum as planned.

Subject matter experts through the tendering phase: NI supported Sumatraco by reviewing suppliers’ specifications and proposals against the design requirements. The selection of the successful proponent was completed of Sumatraco’s own accord.

Project management: NI provided consultants and local staff to ensure that the project schedule was met and to be the liaison between Sumatraco and NI’s international consultant.

Consultation for building construction: NI provided technical support for civil works in the areas of civil drawing, steel structure and building construction.

Consultation during installation and commissioning: In 2014, NI supported Sumatraco to inspect the machinery and equipment before installation and review manuals provided by machine fabricators. NI also supported Sumatraco in optimising the production process during commissioning.

Green energy design: NI designed the new plant with a renewable energy source, natural gas. This has been adopted by Sumatraco in their existing factory to obtain clean, green and efficient output.

Production stage: The biggest challenge was to overcome technical issues at the end of the project in 2014. At the initial commissioning phase, the result was significantly lower than the target - 1.5 – 3 MT per hour as opposed to 10 MT per hour – due to the fluidised bed dryer and thickener. NI provided a qualified consultant and Sumatraco committed to increasing their investment to resolve the issue.

Successful production in 2016: The commissioning was completed satisfactorily in mid-2016 and production was gradually increased. Sumatraco was able to produce quality salt with a capacity of 10 MT per hour by the end of 2016. Sumatraco continues to retain the services of the NI consultant post program completion.

Government support: GOI acted as a facilitator in this partnership with a private company. GOI had issued a regulation to support local industries and Sumatraco was eligible for import duties exemption for such machinery imported\(^27\). This helped reduce Sumatraco’s required investment and GOI ensure that tax-exempted imported machines are utilised by the company.

\(^{27}\) Ministry of Finance Regulation No. 176/PMK.011/2009: Import Tax Exemption for Import of Machines, Equipment, and Materials as Capital Investment to Build and Develop Industry
Positive impacts for salt farmers: Sumatraco has been fostering partnerships with salt farmers from Madura who supply their facilities. Sumatraco has assisted salt farmers by purchasing land for demonstration plots and providing drying machines with flexible purchasing price and payment terms. In 2011, salt farmers who supply to Sumatraco established the “Maju Bersama” Cooperative with a total capital of USD 5,000. There are presently 214 members contributing around USD$ 2 per month. It is expected that this cooperative will help farmers become financially independent and eventually improve their quality of life in the long term.

LESSONS LEARNED

NI’s strategy to partner with a private company resulted in an increased supply of quality iodized salt in the market and protected many Indonesians against IDD. This partnership provided several valuable lessons, including:

1. **Trust**: The unusual partnership model between an international NGO, providing technical assistance to the private sector indicated that trust is fundamental to a successful partnership. Trust was required to be fostered through continuous interactions between the two parties for this high investment project. NI successfully earned the trust by exercising integrity and sincerity as a nonprofit organisation through their staff dedication with no financial gain from the partnership. This partnership also proved to Sumatraco that producing high-quality iodized salt was achievable without compromising company profits.

2. **Mutual benefits**: Partnership frameworks with private sectors must follow the principle of mutual benefits. Strategic alignment of Sumatraco and NI goals was central to this partnership. Sumatraco aimed to expand its business while NI intended to increase production of high-quality iodized salt. In hindsight, the partnership could continue further since NI was directly involved in every stage of the process to ensure success through targeted output.

3. **Commitment**: Commitment from both parties is essential and documents such as the Memorandum of Understanding provides the basis for mutual commitment. The most significant factors that strengthened the commitment was NI’s genuine and continuous support through difficult times.

4. **Communication**: Challenges can be best addressed by maintaining open communication that looks for solutions.

5. **Qualified human resources**: Selection of qualified consultants is crucial to a project’s success. Qualified subject matter experts assisted NI to maintain the schedule and supported Sumatraco by providing appropriate and efficient solutions.

Figure 8. Maju Bersama Cooperative, the fruit of Sumatraco and salt farmer’s partnership to improve the raw salt quality. ©NI, 2017.
NI’s strategy to increase production of quality iodized salt and supply in the market was successful. The key results of the partnership are:

- Additional 60,000 MT per annum of quality iodized salt production: Since the end of 2016, Sumatraco is capable of producing 60,000 MT/year of quality iodized salt with an expected increase to 240 MT/day or 86,000 MT/year (if fully operational for 24 hours/day) (Figure 9).

- The addition of 20 million Indonesians: protected from IDD, including the 3.6 million school age children 5-14-year-old and 4 million women of reproductive age 15-39-year-old. NI’s partnership with Sumatraco will contribute to achieving USI by 2018 in Indonesia.

![Figure 9. Sumatraco’s new plant in Madura to process raw salt from farmers. ©NI, 2017.](image)

![Figure 10. Sumatraco’s Production Capacity (MT/Year).](image)
Sumatraco has successfully achieved ISO 22000, a standard for quality management. They are now able to meet the demands from large food industries with high-quality food grade salt. Along with the significant increase in production capacity, efficient and quality processing has increased Sumatraco’s profit margins. Currently, Sumatraco has built one factory in Madura using NI’s design and is planning to build new plants in Central Java in the near future with a total target production of 400,000 MT/year.

These continuous improvements and developments serve as evidence for the success of the Accelerated USI program strategy.

Sustainability of the project depends on the company’s commitment to continue to grow successfully.

**PT SUMATRACO LANGGENG MAKMUR PROFILE FOR QUALITY IODIZED SALT**

Sumatraco Langgeng Makmur (Sumatraco) (www.garam.co.id) is one of the oldest and largest salt processors in Indonesia. It was established in 1967 by Tan Wie Kong and two workers to produce brick salt manually which was marketed around Surabaya. In 1975, Sumatraco began using machinery for their salt production, using a grant from the government and UNICEF under the iodized salt program. Sumatraco is a family business with headquarters in Surabaya and is currently managed by the third generation. Sumatraco owns a total of six factories: three in Surabaya, one in Gresik and two in West Java.

“To put it simply, we wanted to produce high-quality salt that is at par with our competitor, but we did not have the capability at that time. Our partnership with NI has enabled us to improve our salt quality and increase production quantity, which then increases our sales and profit margin. It is a blessing that we are able to provide good quality iodized salt for our consumers and we now understand that quality iodized salt is important to prevent diseases such as thyroid and mental impairments” (Poni Tan)

Poni Tan, one of the Directors who are the third generation owners of Sumatraco, giving the commitment to producing quality iodized salt to contribute to public health in Indonesia.