

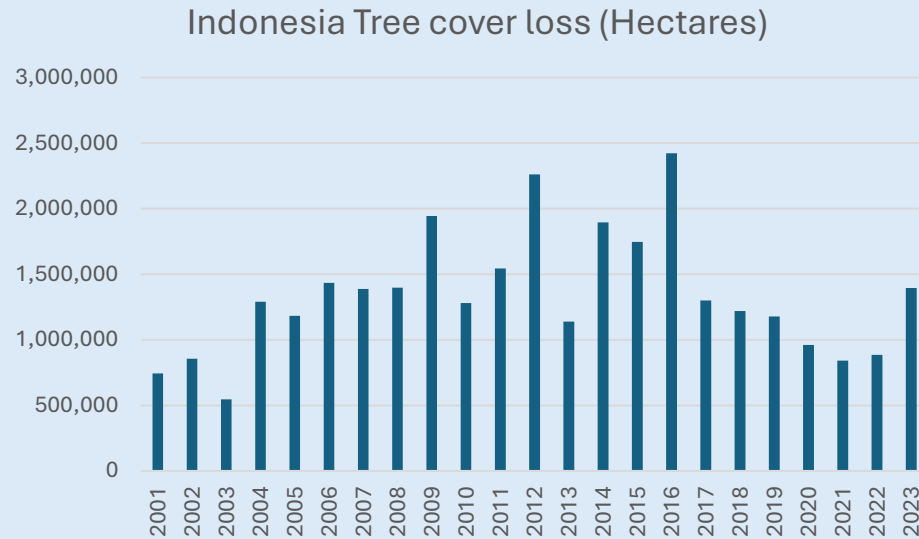
Philippines-Japan Environment Week

Activating Synergies with Nature-based Solutions:
Lessons from Indonesia's Palm Sugar Industry

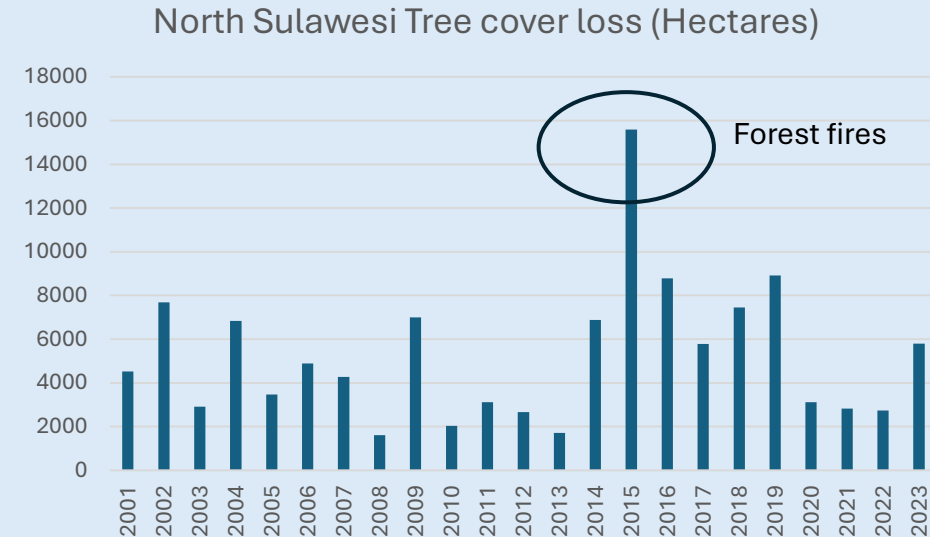
Manila, Philippines
January 2025



Deforestation challenge in Indonesia



Source: Global Forest Watch



Reasons: Palm oil cultivation, clearing land for agriculture, firewood.

Effects: Biodiversity loss, soil erosion, increasing landslides, water pollution.

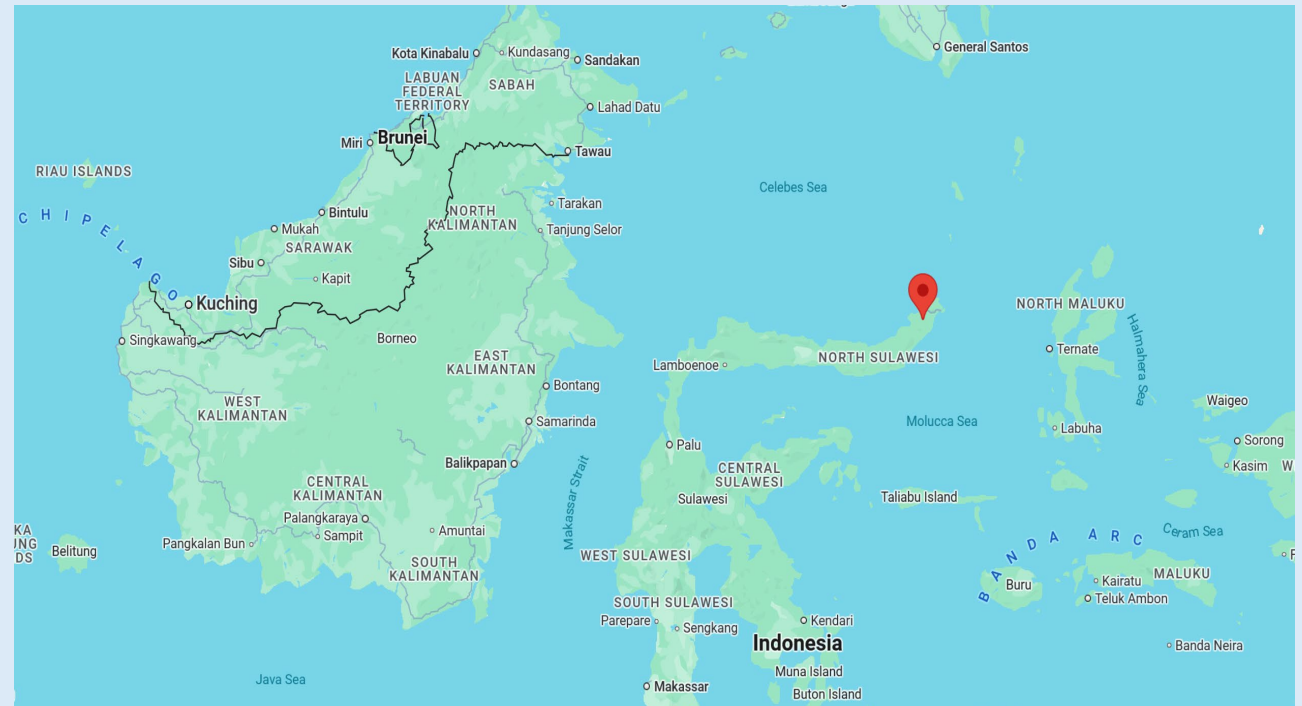
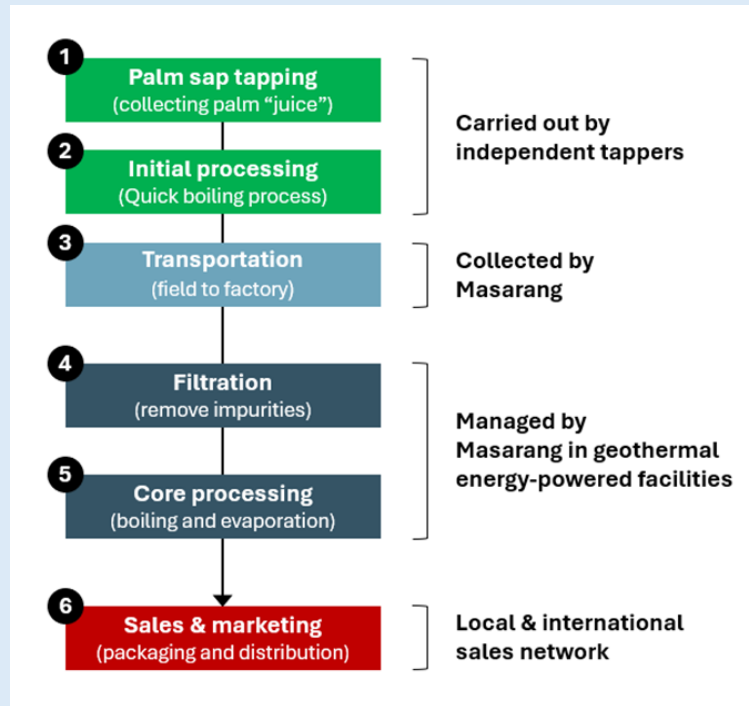
Arenga Palm (*Arenga Pinnata*)

- **Grows in mixed tropical forests in nutrient poor soils and steep slopes - prevents soil erosion and loss of biodiversity.**
- **Roots can penetrate up to 6 metres underground, survive droughts, increase water infiltration and soil retention while reducing fire risk.**
- **Does not require fertiliser. Helps water retention in the land - inhabitants can source clean water nearby for drinking and cultivation.**
- **Extremely climate resilient. Can survive long term submersion underwater and grow near brackish areas - good for areas facing flooding or sea level rise.**
- **Single flower stem produces 10-20 L of juice per day for palm sugar. Local tappers contracted to extract/supply juice and protect the forests from poachers and illegal logging.**
- **Adapting the traditional palm sugar production process to use geothermal energy ensures no deforestation takes place for its production.**



Masarang

Producing palm sugar from Arenga Palm using geo-thermal energy



For more information, please visit <https://masarang.eu/> and <https://themostsustainable.co>

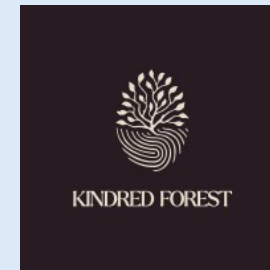
Palm Sugar vs. Cane Sugar

	<u>Palm Sugar</u>	<u>Cane Sugar</u>
Production	Less deforestation.	Monoculture. Deforestation and biodiversity loss.
Use of fertilisers and pesticides leading to water pollution and reduction of biological diversity	None - naturally grown.	Extensive use of fertilisers and pesticides.
Glycemic Index	Low GI relative to cane sugar. Healthier.	High GI. Can lead to sugar spike.
Nutrients	Potassium, zinc, phosphorus and other nutrients.	Mainly carbohydrates.
Sweetness and flavour	Less sweet, caramel like flavour.	More sweet. Refined sugar flavourless.

Current position

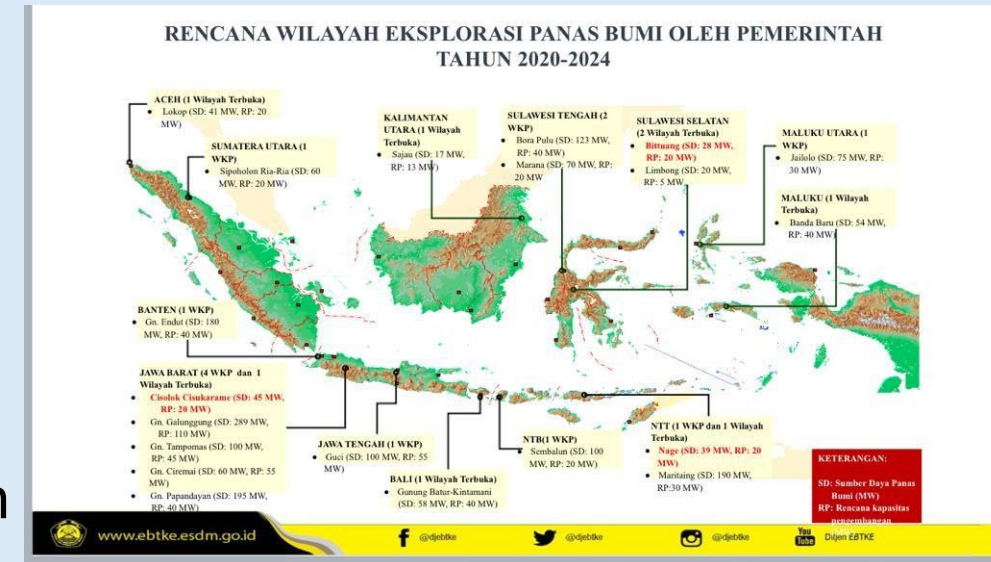
Parameters	2024	2026
Certified organic area (ha.)	192	250
Farmers	16	50+
Daily production (kg.)	150	1000
Countries exported	4	6+
Export sales (US\$)	65K	500K+
Domestic sales (US\$)	18K	100K+

Clients:



Using Geo-thermal Energy

- Masarang uses waste steam from Pertamina's geo-thermal energy plant to process the palm juice to palm sugar.
- In the traditional method 10 kgs of firewood is used to produce 1 kg sugar.
- Using geo-thermal energy reduces deforestation and provides a model for using the waste steam in industry.
- Indonesia has significant geo-thermal resources (like the Philippines) – possible to expand the model all over Indonesia.



Management

- Dr. Willie Smits has been involved with reforestation, sustainable agriculture and primate conservation in Indonesia for more than 30 years.
- Founded the Borneo Orangutan Survival Foundation (BOS), the world's largest organization for the protection of endangered orangutans living in Borneo, in 1991.
- A dedicated team located at Tomohon in North Sulawesi handles the operations of Masarang.
- Portion of profits from the sugar business will be transferred to Masarang Foundation.



Impact

Impact	2024	2026
Protected/ Certified organic area(ha.)	192	250
Trees protected by not using firewood	1000	3000
Farming families with increased income	20	50
Increase in income (percent)	50	50

Additional benefits from Arenga cultivation:

Prevention of landslides

Ground water recharging

Increased biodiversity including habitats for Sulawesi Crested Macaque

SDGs affected



Contribution to NAP and SDGs



Key contributions to the national adaptation plan



Micro-climate control



Biodiversity conservation



Improved water quality & infiltration



Pest and disease control



Enhanced soil quality & resilience



Socioeconomic adaptation



Key contributions to the SDGs

SDG indicators impacted

Project outcomes monitored and evaluated



Poverty headcount ratio

Smallholder farmer income



Sustainable Nitrogen Management Index

Chemical use avoided and crop yield



Unemployment rate

Employment opportunities created



Permanent deforestation percentage

Area conserved via agroforestry

Conclusion

- Arenga Palm cultivation can be a powerful tool for climate adaptation and provide a multitude of environmental and social benefits.
 - Masarang has successfully commercialised the manufacture of organic palm sugar leading to a stable income stream for farmers.
 - Masarang's business model ensures the benefits are shared equitably with the farmers, giving them an incentive to prevent deforestation and poaching.
 - Using geo-thermal energy make the manufacturing process environmentally sustainable and reduces deforestation.
 - Good potential for scaling up and replicating in other parts of S. E. Asia with similar conditions.
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