

SAGO REVOLUTION 5F: BLUEPRINT FOR BIOENERGY INDUSTRY AND CARBON- NEGATIVE CIRCULAR ECONOMY FOR THE WORLD

Adapted from Research - Publication by Sandi Praspa S.T., M.T.



THE GLOBAL HOOK

Vision & Paradox

"Distinguished Investors, Global Agro-Industry Leaders, and Fellow Researchers,

The world is currently racing against time in the face of the 21st century's twin crises: Food Security Deficits and Global Warming. Amidst the search for solutions, the world often overlooks a giant sleeping in Southeast Asia: **Sago (Metroxylon sago)**.

Indonesia possesses **5.5 million hectares** of sago forests, representing **85% of the world's sago population**. Sago is the '**Green Pearl**'. Based on agronomic validation from leading sago expert, **Prof. M. Hasjim Bintoro**, sago productivity can reach **25 to 70 tons of dry starch per hectare per year**—shattering the productivity limits of rice, corn, and wheat absolutely.

❏ However, why hasn't the world taken a massive look at it? The answer lies in the inefficiencies of the past. The conventional sago industry dumps **80% of its biomass** as polluting waste. Today, I stand here not to discuss problems, but to provide **scientific solutions that have been tested and published**.

THE SCIENTIFIC FOUNDATION

Previous Scientific Foundations

"Before our model was born, great scientists attempted to solve the puzzle of the sago industry."

1. From the Land Emissions Perspective

Peatland and GHG emissions expert, **Dr. Petrus Gunarso**, has validated that peatlands are giant carbon pools. If managed with proper water management (*paludiculture*), this land is the largest *Carbon Sink*, not an emission source.

2. From the Manufacturing Perspective

Prof. Tajuddin Bantacut proved through thermodynamics that sago factories can be energy self-sufficient. Their waste has a potential of **90,562 kWh**, far exceeding the factory's requirement of only **26,070 kWh**. He laid the foundation for *Zero Waste*.

3. From the Global Business Perspective

Integrated *biorefinery* research from the **Heriot-Watt University Malaysia** team calculated that sago industry integration requires a *Payback Period* of **6.6 years**.

📌 For the fast-moving modern investment world, a 7-year PBP and *Zero Waste* status are not enough. The world needs a more aggressive, multi-product model with a more radical impact on the climate.

THE DISRUPTION

Introducing the 5F Sago Model

"As an answer to that impasse, our research presents the **5F Integrated Sago Industry Model**."

This is no longer just a theoretical design. It is a *framework* that has been experimentally validated, mass-balanced, and academically published.

The 5F Sago model breaks the boundaries of *Zero Waste* and evolves into a **Climate Positive Industry (Deep Carbon Negative)**, while drastically cutting the *Payback Period* from 6.6 years to **only 2.02 years!**

Exponential Leap

5F

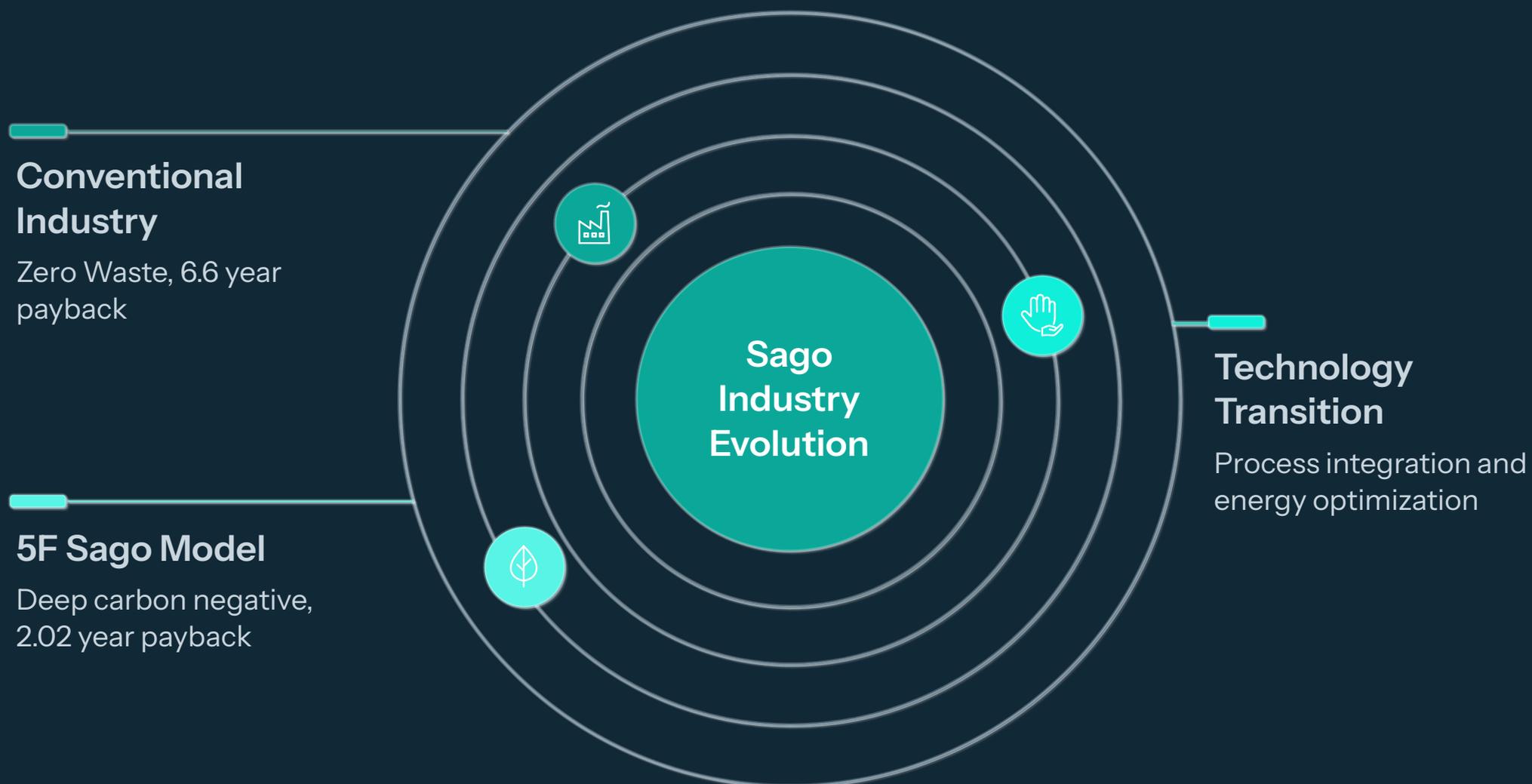
Product Pillar

Multi-product integrated industrial model

2.02

PBP Year

Down drastically from 6.6 conventional years



This transformation is absolute proof of the superiority of the 5F model over the existing conventional sago industry approach.

Sagu 5F Business Mechanics

"How does this exponential leap work? Our model seamlessly integrates three ecosystems:"

1 Upstream — Sagu 5F Integration Estate

Adopting Dr. Petrus Gunarso's ecological vision, we implement a **300-hectare Agro-Silvo-Fishery** model. We restore peatlands, guarantee a supply of **500 logs/day** sustainably, and create biological carbon sequestration without destroying natural forests.

2 Downstream — Integrated Green Biorefinery

Executing Prof. Bantacut's thermodynamic vision commercially. 100% of sago logs are converted through *Bubbling Fluidized Bed* gasification technology into **5 key product pillars** with precision:

- **Food:** Premium Sago Flour — sago analog rice, sago noodles, vermicelli, MSG, liquid sago sugar, functional health foods.
- **Feed:** 16.13 Tons/day of feed from *Zero-Cost Circular Feed Blending* for livestock (cattle, pigs, goats), aquaculture, and poultry.
- **Fiber:** 70 Tons/day of export-quality Biopellets, *biodegradable* bioplastics, biocomposites, and hybrid biocomposite roof tiles.
- **Fertilizer:** Biochar valued at USD 160/Ton while serving as a carbon-locking agent for agricultural land.
- **Fuel:** 500 kW independent electricity from *syngas* gasification, Biogas, *Biocoal*, Bioethanol, Green Hydrogen, and SAF (*Sustainable Aviation Fuel*).

3 System — Smart Green Ecosystem

We integrate IoT and *Blockchain ERP*. All supply chains and carbon sequestration are validated and recorded in *real-time*, making them transparent assets immune to *greenwashing* accusations.

UNMATCHED FINANCIAL METRICS

Investment Feasibility Validation

"For you, investors and industry leaders, numbers speak the loudest. Our diversification innovation breaks commodity risk into **6 simultaneous revenue streams.**"

With a measured capital expenditure (CAPEX) of **USD 5.8 Million**, the *Sagu 5F* financial projection yields:

\$7.15M

Total Revenue/Year

Fiber/Biopellet pillars contribute up to USD 2.1 Million

50.4%

EBITDA Margin

Highly efficient: zero electricity bills, zero-cost feed raw materials

\$10.4M

NPV

Strong positive Net Present Value

48.59%

IRR

Highly attractive, outperforming conventional investment instruments

2.02

Payback Period (Years)

Super fast capital recovery — absolute proof of the 5F model's superiority over the 6.6-year conventional industry model

THE ENVIRONMENTAL CROWN JEWEL

Carbon Negative Validation

Sago 5F Carbon Balance

-9,169

Tons CO₂e/Year

Deep Carbon Negative — validated by IPCC & Verra VCS standards

We are not just '**Carbon Neutral**'. Evaluations based on IPCC and Verra VCS standards validate that Sago 5F is a **Deep Carbon Negative** industry.

Carbon Sequestration Sources

- **Upstream conservation sequestration** through peat restoration and the Agro-Silvo-Fishery model
- **Fossil energy substitution** through independent electricity generation from syngas gasification
- **Fertilizer Pillar — Biochar** resulting from gasification that locks carbon in the soil for hundreds of years

- This carbon negative status is valued via *Blockchain* into **Carbon Credits** worth hundreds of thousands of dollars per year—the maintenance costs of your factory machinery are literally paid for by the global carbon market!

What makes the Sago 5F model a star for global ESG (*Environmental, Social, and Governance*) initiatives is its ability to restore the climate.

CALL TO ACTION

Invitation to Collaborate

"Ladies and Gentlemen, the novelty of the 5F Integrated Sago Industry has been scientifically proven and is ready for scaling."

This is not just a conventional flour mill. This is an integrated decarbonization ecosystem that simultaneously produces 5 Pillars (5F):



Food

Sago analog rice, sago noodles, sago vermicelli, MSG, health foods, to liquid sago sugar.



Feed

Commercial nutritional supply for fisheries, poultry, as well as cattle, pig, and goat livestock.



Fiber

Export biopellets, biodegradable bioplastics, and hybrid biocomposite roofing tiles.



Fertilizer

Commercial-grade biochar as a soil amendment and carbon sequestering agent.



Fuel

Syngas gasification electricity, green hydrogen, bioethanol, SAF, and biocoal.

Policy Makers

This is the absolute Blueprint for National Strategic Projects (PSN).

Global Agro-Industry & Green Energy Investors

We invite you to adopt, invest in, and replicate this *Sago 5F* ecosystem.

Let us free the world from the wheat import trap, achieve bioenergy self-sufficiency, drive a commercial circular economy, and save the earth through one resilient commodity: **SAGO**. Thank you.

Thank You



Sagu 5F invites impact investors, government and NGO stakeholders, sustainability professionals, and partners in peatland restoration and green biorefinery to collectively create transformative change.

Let's Connect



- **Email:** info@sago5f.biz.id
- **Website:** www.sago.biz.id

#SAGU5F

#CARBSTHATHEAL

#GREENINDUSTRY

#RENEWABLEENERGY

#CARBONNEGATIVE

"We are not selling sago. We are building the future of transparent, sustainable, and digitally-enabled agriculture in Southeast Asia."

Together we build a regenerative circular economy, restore peatlands, and create green products for future generations.