Seed Money Project - Indonesia
Sago-starch based biodegradable plastics films

Fresia Alvarado Chacon

Project leader Wageningen Food & Biobased Research

15/12/2022

WAGENINGEN
UNIVERSITY & RESEARCH

SMP Sago-starch based biodegradable plastics films

Goal

Study the feasibility of using sago starch as a raw material for the production of biodegradable plastic films.

Project partners

SFP Social Forestry

BIO PLASTIC SHOP

Embassy of the Kingdom of the Netherlands

Tropical Landscapes Finance Facility

springfields
INNOVATIVE INTERNATIONAL DEVELOPMENT SOLUTIONS

UNISON JAYA
PLASTIC MANUFACTURING COMPANY

Other parties

enviPLAST

WU-ESA

AVANI

Greenhope

WAGENINGEN
UNIVERSITY & RESEARCH

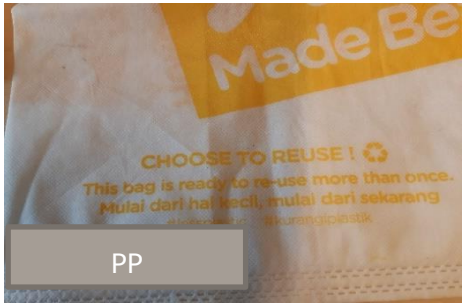
Governor and communities in Selat Panjang and Sungai Tohor

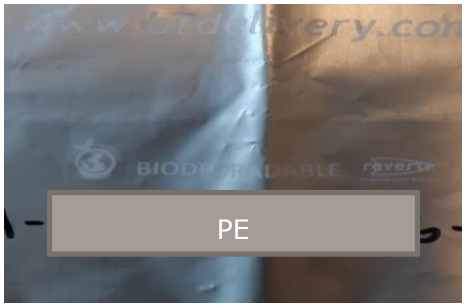
Project approach

- Compare sago starch to commonly used types of starch
- Collect biobased plastics market information
- Proof of principle – films containing sago starch
- Visit to Indonesia to discuss with stakeholders (visit sago production sites)

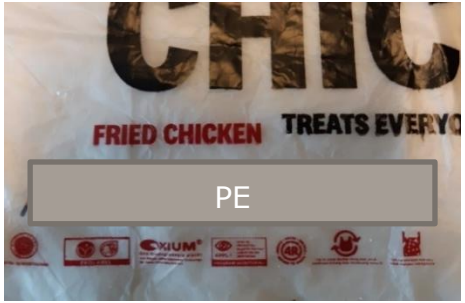
Current plastic bags in the Indonesian market

Conventional plastics
Reusable or with incorrect claims





Conventional plastics + starch
and Oxo-degradables



OXIUM® Biodegradable Additive

ecoplas® Starch-based Biodegradable Bioplastics

Price competitive

Claim to be degradable in landfills

But they are not <u>bio</u>degradable

They are banned in Europe

Water soluble and biodegradable bags
Based on cassava/corn starch

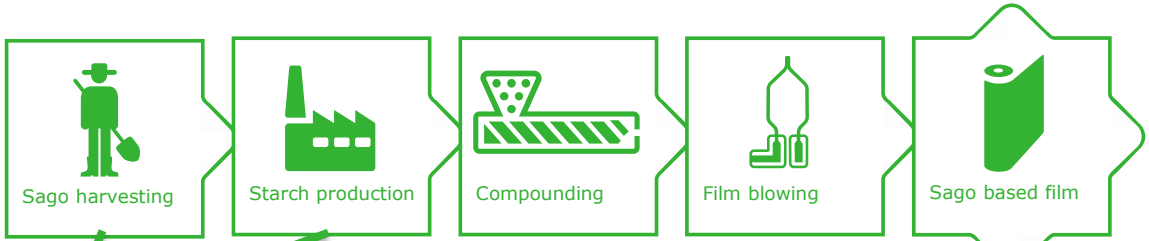
Very few producing companies

Not price competitive (yet)

They could be certified in Europe

WAGENINGEN UNIVERSITY & RESEARCH

Starch-based plastics landscape in Indonesia



Greenhope

enviPLAST

New investors

AVANI

UNISON JAYA

Other convertors

Many possible applications in Asia and/or Europe

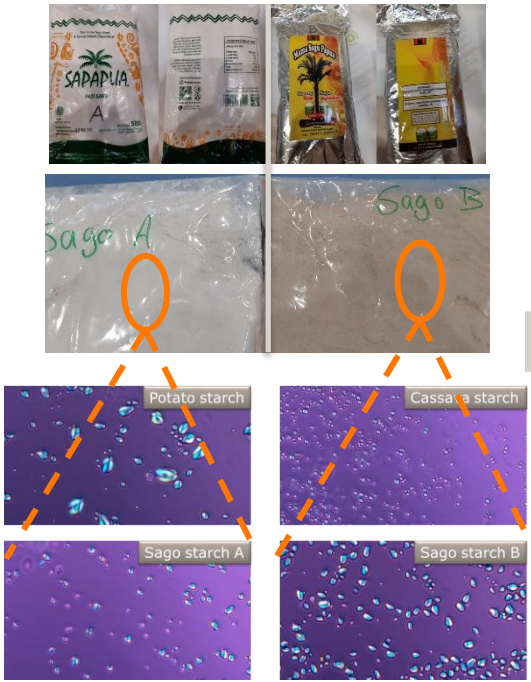
Still open questions on different qualities and properties of the starch from the different regions.

WAGENINGEN UNIVERSITY & RESEARCH

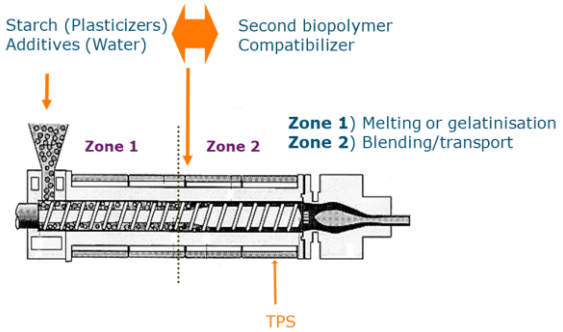
INAPLAS The Indonesia Olefin, Aromatic and Plastic Industry Association

Proof of principle – making sago starch films

Starch analysis



Starch compounding



WAGENINGEN
UNIVERSITY & RESEARCH

Conclusions and next steps

- First trials with **sago starch** are promising. Processability is similar to cassava starch, process is stable. Film production is possible resulting in products comparable to those based on cassava.
- Information obtained during project sketches the potential/obstacles of starch-based and biodegradable plastics introduction in Indonesia.
- Still questions open for further research and possibilities of product development.
- Potential follow up projects:
    - SustainPalm (Sago palm as substitute of oil palm)
    - Collaboration with WU Environmental System Analysis Group, joint phD, possibilities of writing proposals together (i.e. spark grants)
    - Collaboration for developments with Springfields / Unison Jaya

Questions ?!

Contact us
Fresia Alvarado Chacon
Fresia.alvaradochacon@wur.nl

Matthijs van Lint
matthijs.vanlint@wur.nl

Acknowledgements:
WUR: Marieke Hilhorst, Ingrid Haaksma, Herman de Beukelaer, Karin Molenveld, Aritta Suwarno

All who made possible the visit to the different plastic companies in Indonesia and the visit to the sago starch production site in the Meranti region.