

Higher Education is the Key to Economic Growth

Stella Christie

Vice Minister of Higher Education, Science, and Technology
Republic of Indonesia



**Ministry of Higher Education,
Science, and Technology
Republic of Indonesia**



Asta Cita: President Prabowo's Eight-Point Vision



Asta Cita

Presiden Prabowo & Wapres Gibran



- 1 Memperkokoh ideologi Pancasila, demokrasi, dan hak asasi manusia (HAM)
- 2 Memantapkan sistem pertahanan keamanan negara dan mendorong kemandirian bangsa melalui swasembada pangan, energi, air, ekonomi kreatif, ekonomi hijau, dan ekonomi biru
- 3 Meningkatkan lapangan kerja yang berkualitas, mendorong kewirausahaan, mengembangkan industri kreatif, dan melanjutkan pengembangan infrastruktur.
- 4 Memperkuat pembangunan sumber daya manusia (SDM), sains, teknologi, pendidikan, kesehatan, prestasi olahraga, kesetaraan gender, serta penguatan peran perempuan, pemuda, dan penyandang disabilitas
- 5 Melanjutkan hiliriasi dan industrialisasi untuk meningkatkan nilai tambah di dalam negeri
- 6 Membangun dari desa dan dari bawah untuk pemerataan ekonomi dan pemberantasan kemiskinan
- 7 Memperkuat reformasi politik, hukum, dan birokrasi, serta memperkuat pencegahan dan pemberantasan korupsi dan narkoba
- 8 Memperkuat penyelarasan kehidupan yang harmonis dengan lingkungan, alam, dan budaya, serta peningkatan toleransi antarumat beragama untuk mencapai masyarakat yang adil dan makmur.

4. Strengthening the development of **human resource, science, technology, education, health, sports achievements, gender equality, and empower the roles of women, youth, and persons with disabilities.**



Since the 1930's **Stanford University** alumni and faculty had started nearly **40,000 companies** that employed **5.4 million people** and generated **\$2.7 trillion in annual revenues**, putting Stanford among the world's ten largest economies

As of 2014, **MIT**'s living alumni had founded over **30,000 companies** that employed 4.6 million people and generated nearly **\$2 trillion in annual revenues**

University of Kansas drives **\$7.8 billion annual economic impact** in Kansas; supports nearly **88,000 jobs**

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nature index

2016: **5** of the world's top ten academic institutions generating high-quality research were American and **1** was Chinese.

Position	Institution
1	Chinese Academy of Sciences (CAS), China
2	Harvard University, United States of America (USA)
3	French National Centre for Scientific Research (CNRS), France
4	Max Planck Society, Germany
5	Stanford University, United States of America (USA)
6	Massachusetts Institute of Technology (MIT), United States of America (USA)
7	Helmholtz Association of German Research Centres, Germany
8	The University of Tokyo (UTokyo), Japan
9	University of Oxford, United Kingdom (UK)
10	University of Cambridge, United Kingdom (UK)

2025: **8** are Chinese, only **2** others (American & German)

Position	Institution	▲	▼
1	Chinese Academy of Sciences (CAS)		
2	Harvard University		
3	University of Science and Technology of China (USTC)		
4	Zhejiang University (ZJU)		
5	Peking University (PKU)		
6	University of Chinese Academy of Sciences (UCAS)		
7	Tsinghua University		
8	Shanghai Jiao Tong University (SJTU)		
9	Nanjing University (NJU)		
10	Max Planck Society		



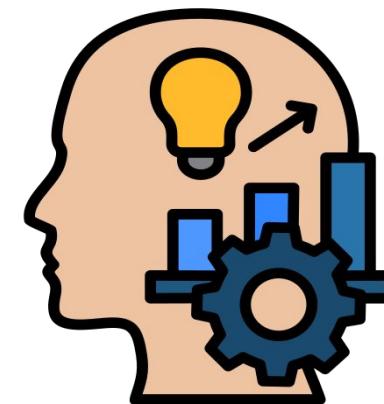
Two mechanisms through which **higher education drives economic growth**

1



skilled workforce

2



research innovation



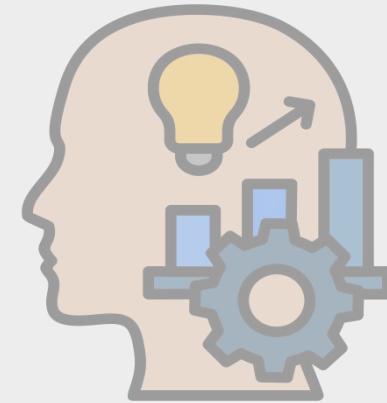
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Indonesia is strategic for investment: 28 key natural resources

Mineral



Coal



USD 498.4 Billion

Coal Nickel Tin Copper



Bauxite Stainless Steel Gold Silver



Silica Sand Manganese Cobalt Cobalt Rare Earth materials



Crude Oil



Natural Gas



USD 68.3 Billion

Crude Oil Natural Gas



Economic impact until 2040



Investment
618.1 Billion USD



Export
857.9 Billion USD



GDP
235.9 Billion USD



Employment
3,016,179 workers

Agriculture



Maritim



Fisheries



Forestry



USD 51.4 Billion



Fish TCT Crab Seaweed Salt



Nutmeg Cocoa Tilapia





Economic growth through downstream industrialization requires a skilled workforce



***Industry-Matched
Curriculums***

***Industry-Matched
Instructors***

***Industry-Matched
Infrastructures***

National Downstreaming Blueprint 2025–2030:

21 priority downstream projects in the first phase (2025)

30,000 technicians needed for oil refineries with a capacity of 500,000 barrels/day

15,000 plant operators for DME (Dimethyl Ether) production facilities as LPG substitutes

5,000 big data specialists to support the national employment outlook system

10,000 smelter experts for copper and aluminum processing plants



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Vocational Ed + Industry Policy of MoHEST RI

*Industry-Matched
Curriculums*

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Infrastructures*

中国-东盟教育部长对话会
China-ASEAN Education Ministers Dialogue





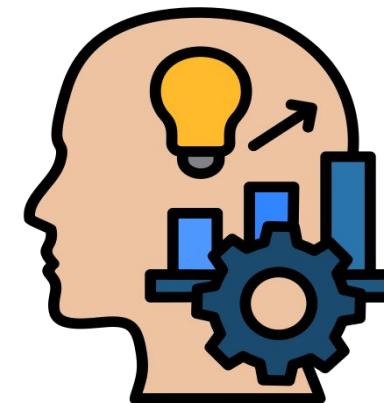
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Indonesia is strategic for investment: 28 key natural resources

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Rare Earth materials



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Crude Oil



Natural Gas



Natural Gas



Agriculture



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Fisheries



Forestry



USD 51.4 Billion

Palm Oil



Coconut



Rubber



Seaweed

Log



Resin



Economic impact until 2040



Investment
618.1 Billion USD



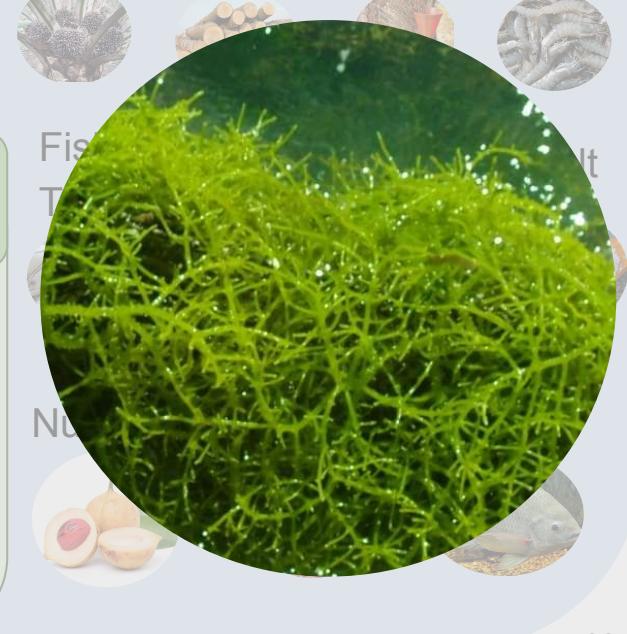
GDP
235.9 Billion USD



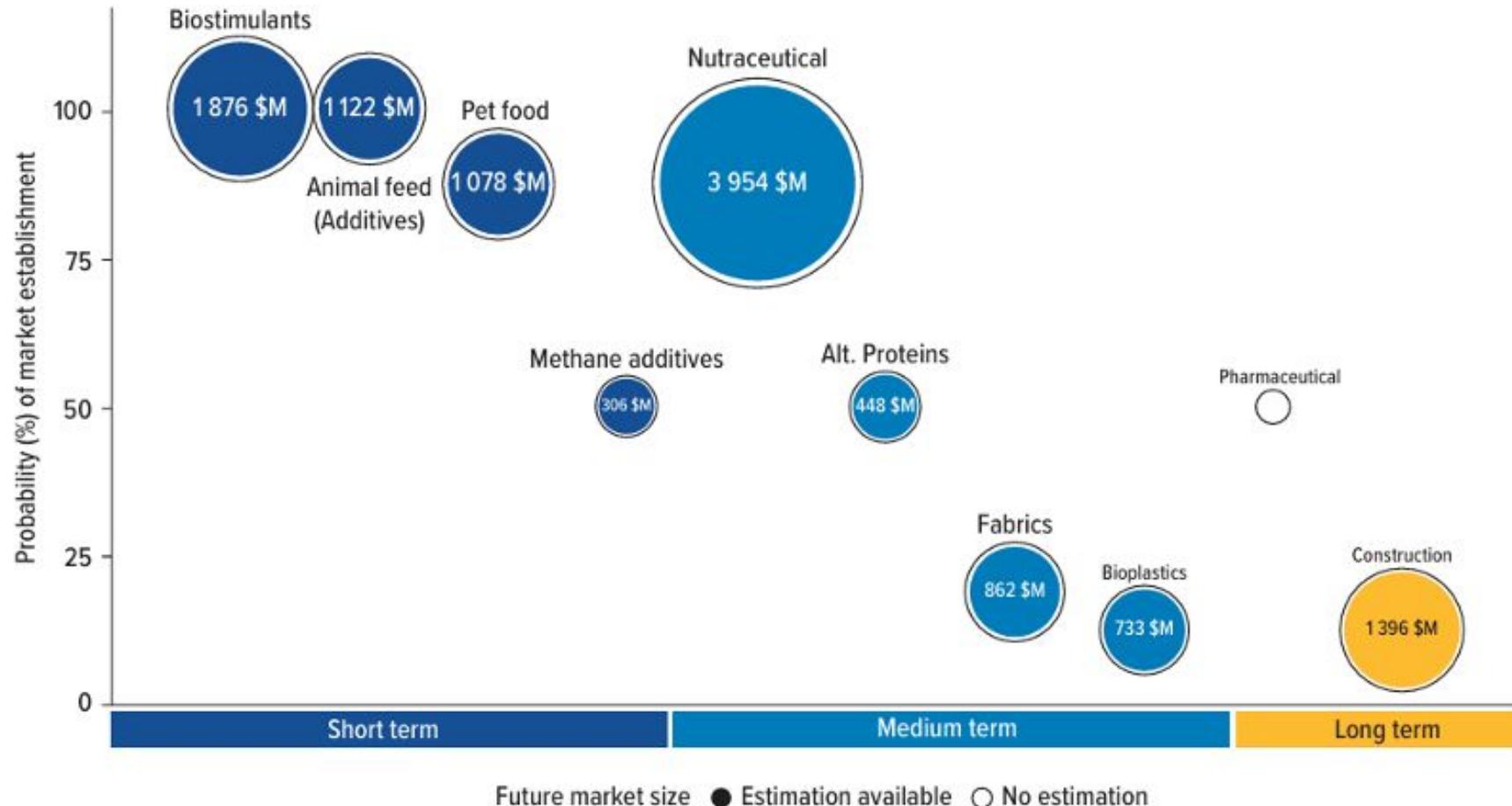
Export
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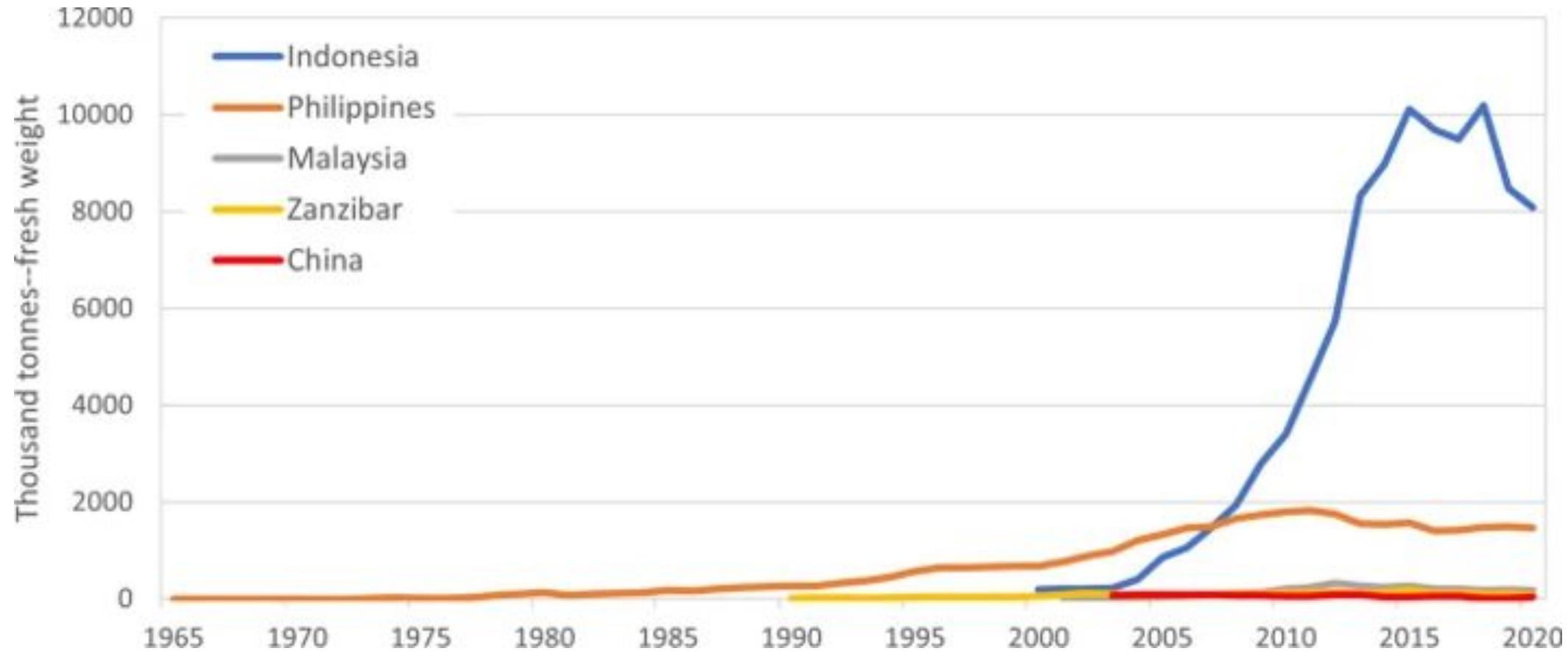
Employment
3,016,179 workers



Seaweed has high economic potential, valued at USD 12 billion

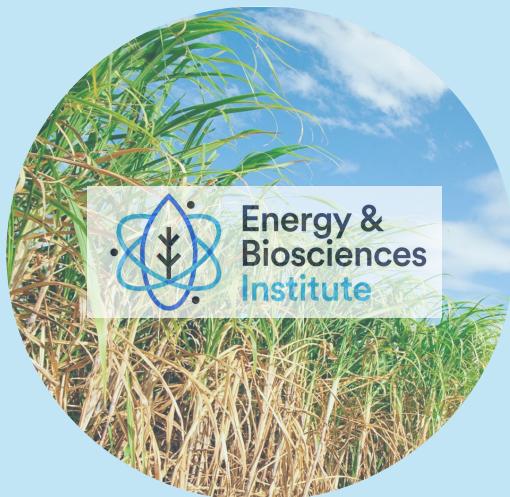


Indonesia is the world's largest producer of tropical seaweed



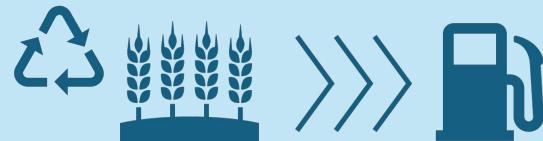
Seaweed: the emerging biomass feedstock

1st Generation feedstock for biofuels: Food Crops



EBI was created to solve the food vs. energy dilemma

2nd Generation feedstock for biofuels: use of agricultural residues



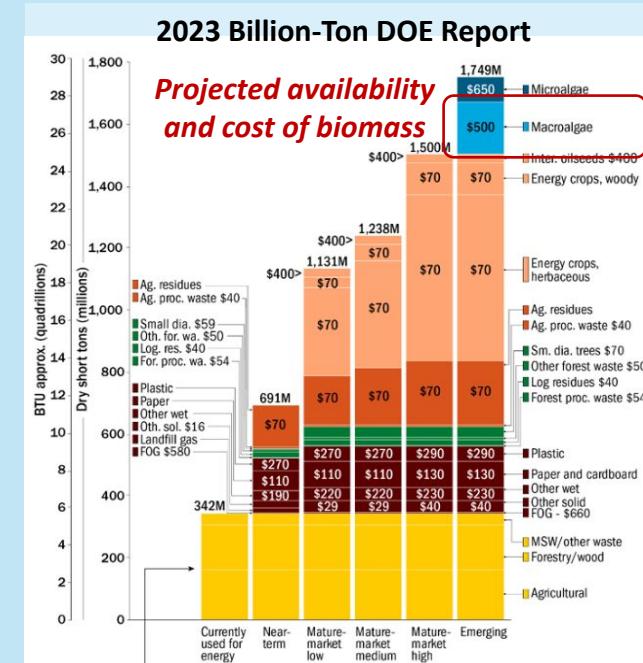
...but breaking down lignin turned out very energy and resource intensive



A different feedstock is needed!

3rd Generation feedstock that does not:

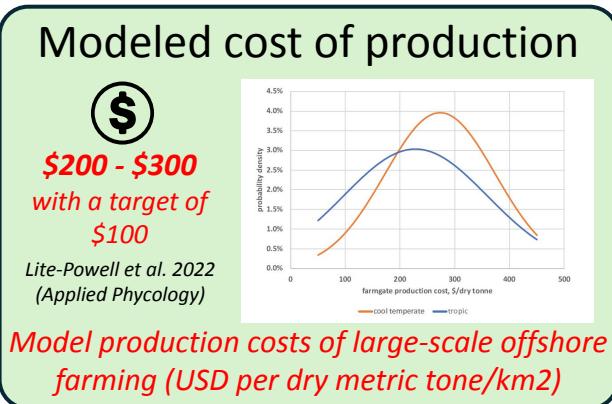
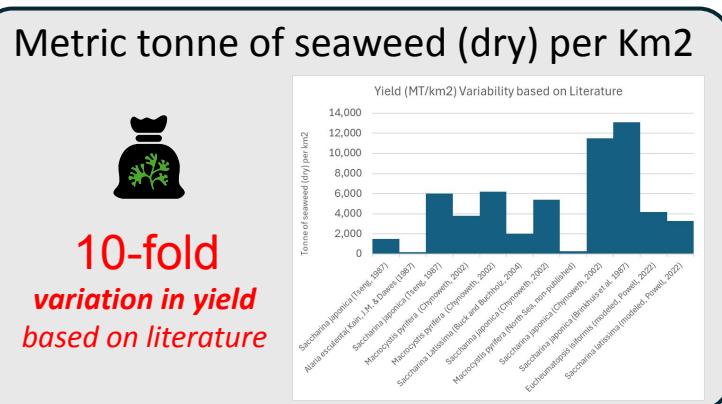
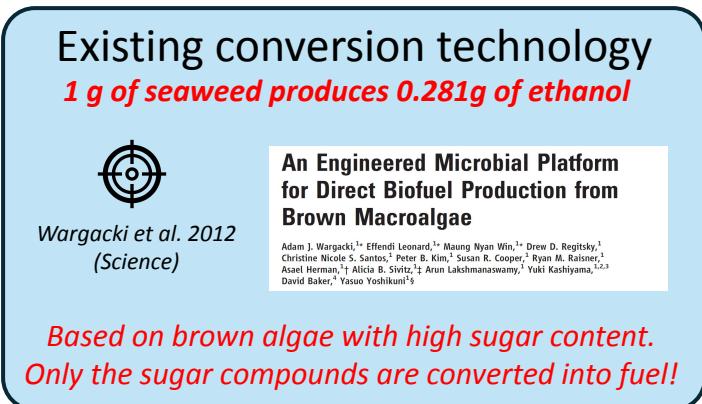
- ✓ Compete with food
- ✓ Require fertilizers and freshwater
- ✓ Contain lignin



IBMC was created to upscale seaweed as a feedstock for the bioeconomy

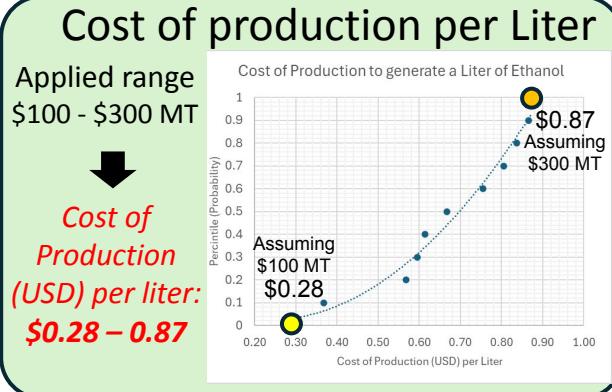
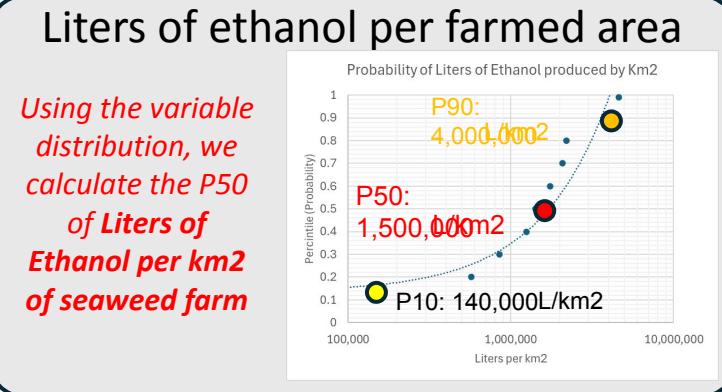
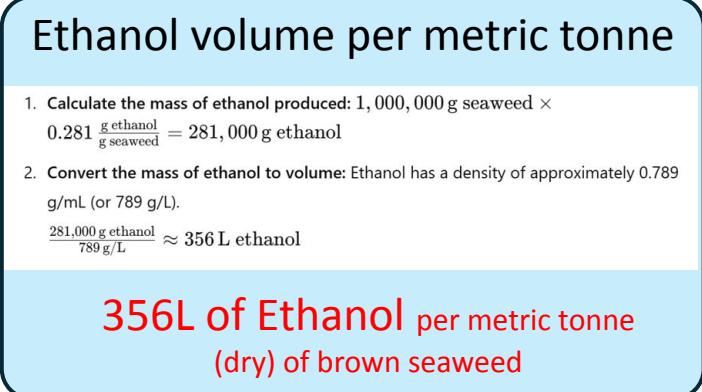
What would take for Indonesia to produce 10% of jet fuel global demand based on SAF?

ASSUMPTION



PROBABILISTIC ANALYSIS

P10: conservative
P50: median
P90: optimistic

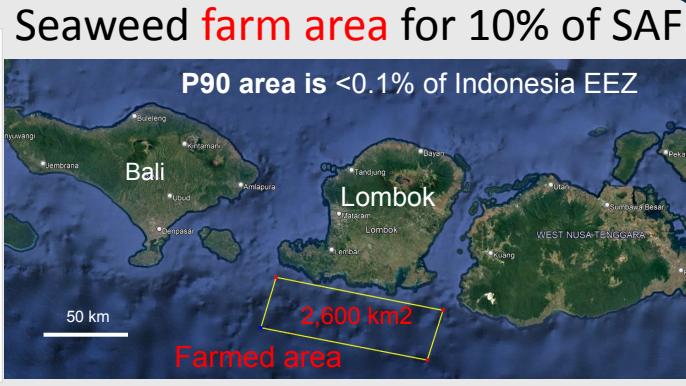
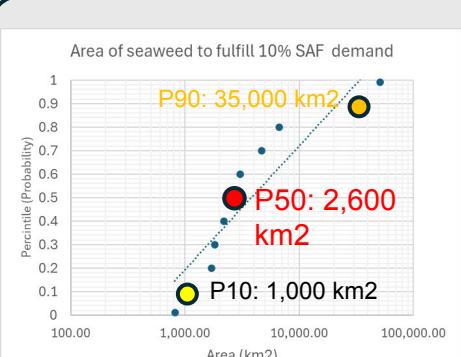


TARGET

SAF Production target:



4 Billion Liters*
*10% of Jet fuel demand (SAF) annually



Benchmarking biofuel cost:

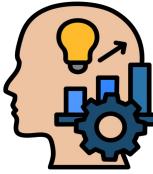


\$1 L cost of biofuel at the pump in Indonesia

This means that seaweed biofuel can be competitive in a local and global market



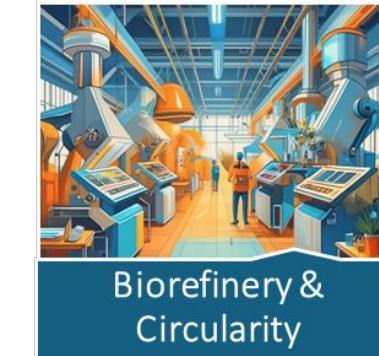
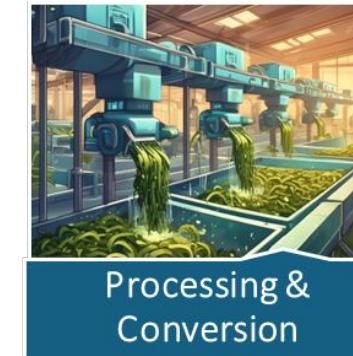
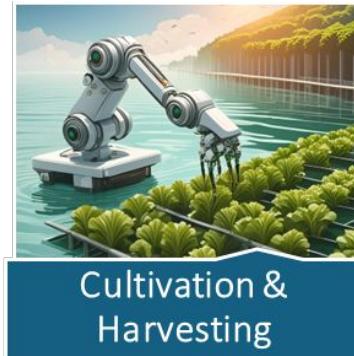
Unlocking Seaweed's Economic Potential Requires Research



*Consistent
supply & yield
improvement*

Production cost
efficiency

Product
development





MoHEST RI



University of Mataram



UC Berkeley



**Beijing Genomics
Institute**



**Indonesian Employers'
Association (APINDO)**



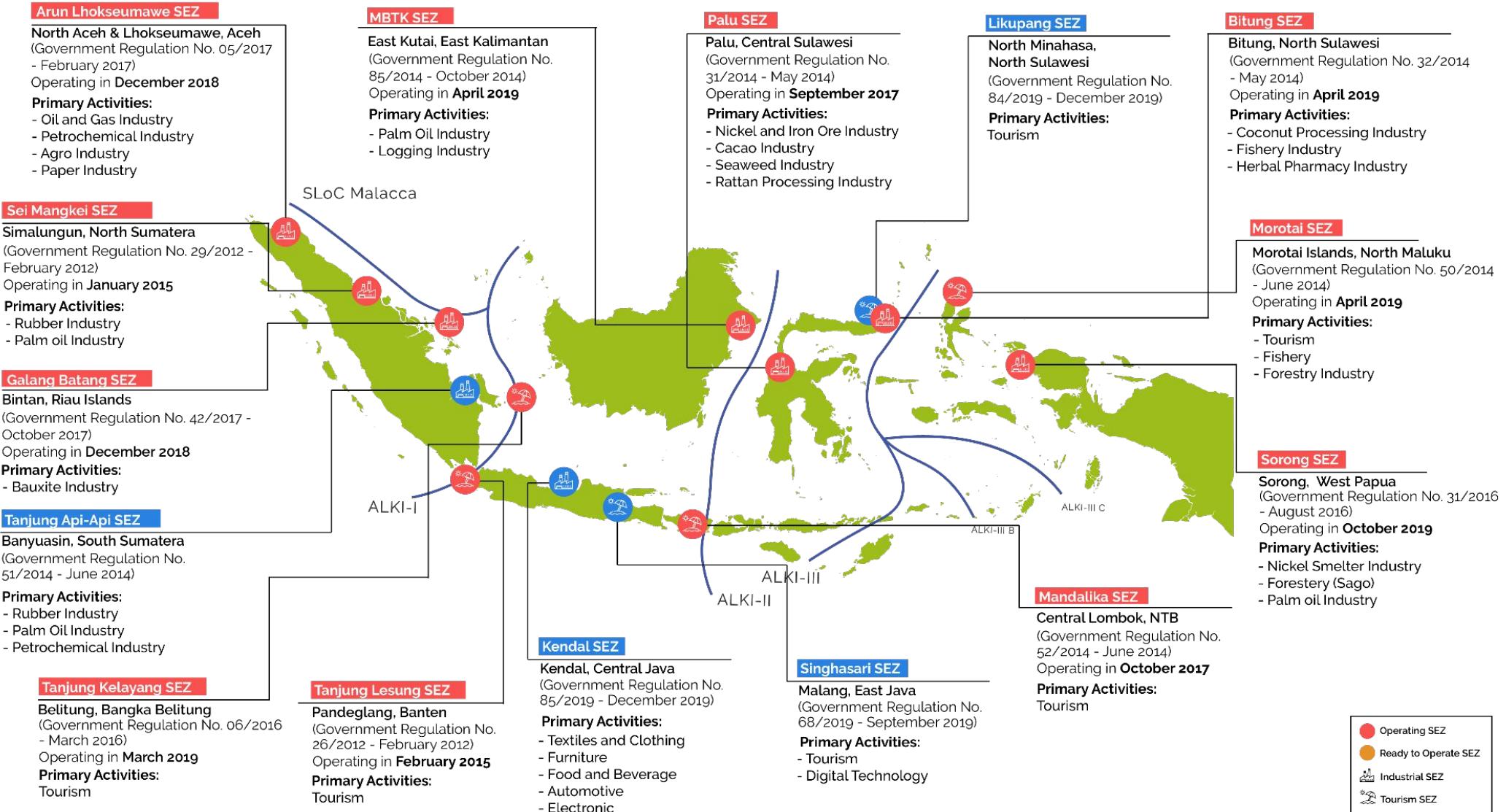


Partnership between academia and private sectors

- In the EU, companies fund **59%** of total R&D;
- In the US, **63%**;
- In **China, South Korea, and Japan, over 75%** of R&D investment comes from the private sector.



Indonesia's Special Economic Zones





Indonesia's Special Economic Zones



Arun Lhokseumawe SEZ

North Aceh & Lhokseumawe, Aceh
(Government Regulation No. 05/2017 - February 2017)
Operating in December 2018

Primary Activities:
- Oil and Gas Industry
- Petrochemical Industry
- Agro Industry
- Paper Industry

Sei Mangkei SEZ

Simalungun, North Sumatera
(Government Regulation No. 29/2012 - February 2012)
Operating in January 2015

Primary Activities:
- Rubber Industry
- Palm oil Industry

Galang Batang SEZ

Bintan, Riau Islands
(Government Regulation No. 42/2017 - October 2017)
Operating in December 2018

Primary Activities:
- Bauxite Industry

Tanjung Api-Api SEZ

Banyuasin, South Sumatera
(Government Regulation No. 51/2014 - June 2014)

Primary Activities:
- Rubber Industry
- Palm Oil Industry
- Petrochemical Industry

Tanjung Kelayang SEZ

Belitung, Bangka Belitung
(Government Regulation No. 06/2016 - March 2016)
Operating in March 2019

Primary Activities:
Tourism

Tanjung Lesung SEZ

Pandeglang, Banten
(Government Regulation No. 26/2012 - February 2012)
Operating in February 2015

Primary Activities:
Tourism

MBTK SEZ

East Kutai, East Kalimantan
(Government Regulation No. 85/2014 - October 2014)
Operating in April 2019

Primary Activities:
- Palm Oil Industry
- Logging Industry



Palu SEZ

Palu, Central Sulawesi
(Government Regulation No. 31/2014 - May 2014)
Operating in September 2017

Primary Activities:
- Nickel and Iron Ore Industry
- Cacao Industry
- Seaweed Industry
- Rattan Processing Industry



Likupang SEZ

North Minahasa, North Sulawesi
(Government Regulation No. 84/2019 - December 2019)

Primary Activities:
Tourism



Bitung SEZ

Bitung, North Sulawesi
(Government Regulation No. 32/2014 - May 2014)
Operating in April 2019

Primary Activities:
- Coconut Processing Industry
- Fishery Industry
- Herbal Pharmacy Industry



Morotai SEZ

Morotai Islands, North Maluku
(Government Regulation No. 50/2014 - June 2014)
Operating in April 2019

Primary Activities:
- Tourism
- Fishery
- Forestry Industry



Sorong SEZ

Sorong, West Papua
(Government Regulation No. 31/2016 - August 2016)
Operating in October 2019

Primary Activities:
- Nickel Smelter Industry
- Forestry (Sago)
- Palm oil Industry



Kendal SEZ

Kendal, Central Java
(Government Regulation No. 85/2019 - December 2019)

Primary Activities:
- Textiles and Clothing
- Furniture
- Food and Beverage
- Automotive
- Electronic



Singhasari SEZ

Malang, East Java
(Government Regulation No. 68/2019 - September 2019)

Primary Activities:
Tourism
Digital Technology



Mandalika SEZ

Central Lombok, NTB
(Government Regulation No. 52/2014 - June 2014)
Operating in October 2017

Primary Activities:
Tourism

ALKI-I



ALKI-II

ALKI-III

ALKI-III B

ALKI-III C

UNIVERSITAS MATA RAJU

- Operating SEZ
- Ready to Operate SEZ
- Industrial SEZ
- Tourism SEZ