TNB*Aura*

Perspectives: Offering the latest intelligence on emerging industries and business models

AgriTech Edition

The Investment Case For AgriTech in Southeast Asia

Within this edition, we focus on the topic of AgriTech, and ask ourselves the following questions:

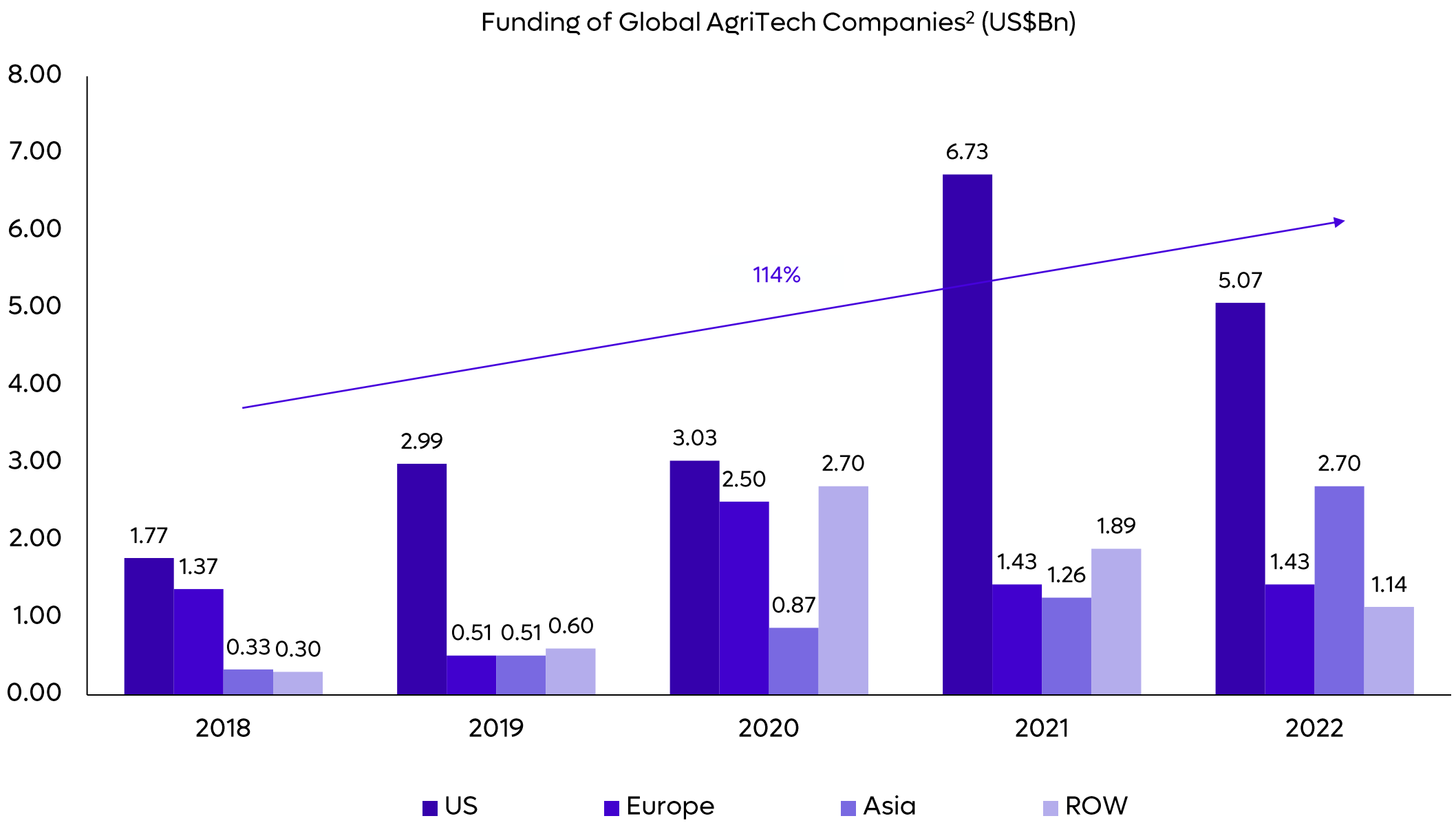
i. How does Southeast Asia and the global markets compare in terms of the maturity of the AgriTech Industry

ii. Why is Indonesia one of the leaders of AgriTech in Southeast Asia

iii. Which business model(s) are potential winners in the regional value chain

Market Opportunities

While AgriTech in US and ROW[1] have historically been the most funded, Asia has attracted significant investment activity as shown with its growth in funding of 114% in recent years



1. ROW (Rest of World) = Latin America, Argentina, Brazil, Chile, Mexico, Colombia 2. Statista, Pitchbook (Inclusive of fundings by Venture Capital and Private Equity funds)

Southeast Asia's Agriculture Market Opportunities

In 2019, Agri-food sector's total contribution to GDP across Southeast Asia **contributed around US$717bn**, representing a 30% increase over 5 years[1]

Malaysia and Indonesia accounted for more than **90% of the world's palm oil export** and more than **40% of the rice imported to the EU**[2] came Vietnam, Thailand, Myanmar, or Cambodia during the period 2019-2021

SEA's agriculture sector's employment rate grew by **a total of 4.9 million jobs**[1] between 2015-2019, representing an 8% increase over the past 5 years

1. Foodindustry: The Economics Impact of The Agri-Food Sector in SEA 2021; 2. Asia Perspective: Sourcing of Agriculturals Products in SEA

Indonesia is ripe for innovation in this historically traditional market

	India	China	US	Indonesia
Agriculture value (of GDP)[1]	16%	17.1%	0.9%	12.7%
Agriculture value (US$B)[1]	476	856	165	128
% of Total Farms that are small holder (Landholding < 2ha)[2]	86.2%	98%	4%	93%
Average Plot Size (ha)[3]	1.1	0.4	178.4	0.6
Mechanization Rate[4]	40%	67%	76%	10%
Below Poverty Line Rate in Smallholder Farmers (%)[5]	20%	28%	10%	18%
Digital Penetration (%)[1]	47%	70.9%	19.8%	73.7%
Ripe for Innovation[6]	High	High	Medium	High

Indonesia's agriculture industry makes up a significant portion of its GDP but, indicators suggest that the region is still highly inefficient compared to other regions

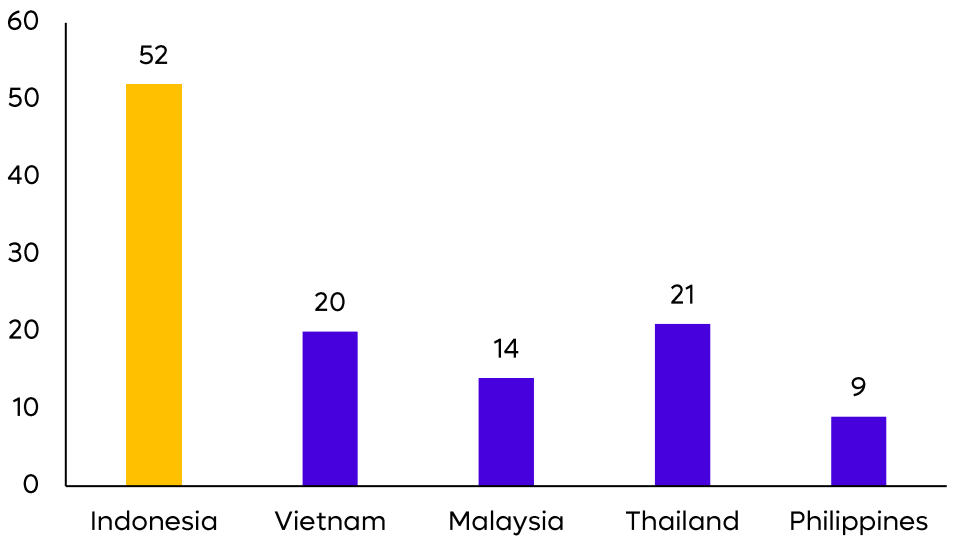
- ***Large % of small holder farmers*** *in the region typically do not have access to the same* ***technology/resources*** *as larger commercial farms*
- ***Low mechanization rate*** *and* ***high supply chain inefficiencies*** *creates opportunity for innovation and disruption*
- ***High digital penetration*** *and* ***relatively low poverty rate*** *among farmers present an opportunity for a high adoption rate*

1. Statista (2022) 2.Croplifeasia: Smallerholder Farmers- Agricultural Biotechnology (2022); BKPM Indonesia: Investment to Drive Digital Agriculture Practices in Indonesia; USDA: Farms and Land in Farms 2021 Summary 3.ceicdata; Voxdex: Farm Size and Productivity: Evidence from India; MDPI: Agricultural Production Services, Farm Size and Chemical Usage; USADA (2022) 4. Biotecharticles: Statues of Farm Mechanization in Indian Agriculture; Gov.CN: China's Farm Mechnization Rate Exceeds 70% in 2019; Statista; IEOMSociety 5. Worldbank; USADA: Farm Poverty Lowest in US History; Leap (2022) 6. Grcglobalgroup: Inefficiencies in Indian Agriculture; Foodlogistic: China's Digititalization of Food Supply Chains Underscores What Comes Next; News: Supply Chain Crunches Affecting Agri; Researchgate: Tackling the Problem of Crops Supply China in ID (2022)

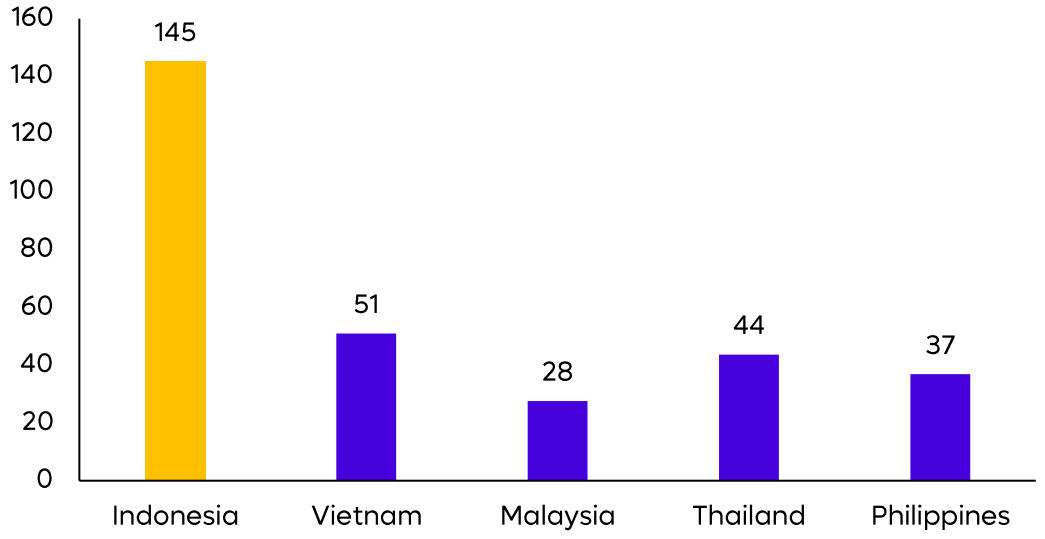
Why Indonesia?

For AgriTech, Indonesia has the most mature startup ecosystem, and its large farming population is conducive to the region's growth in the coming years

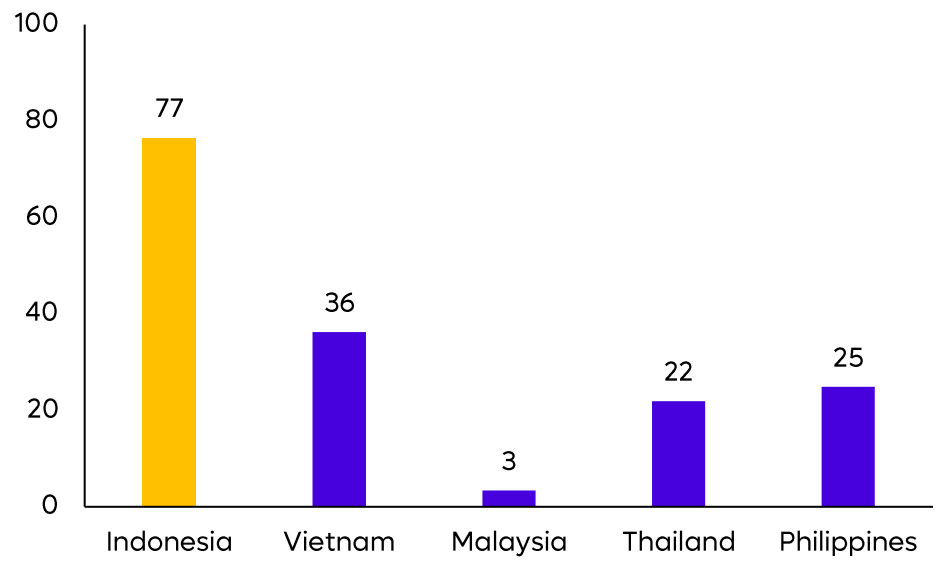
No. of AgriTech startups as of Dec 2022[1]



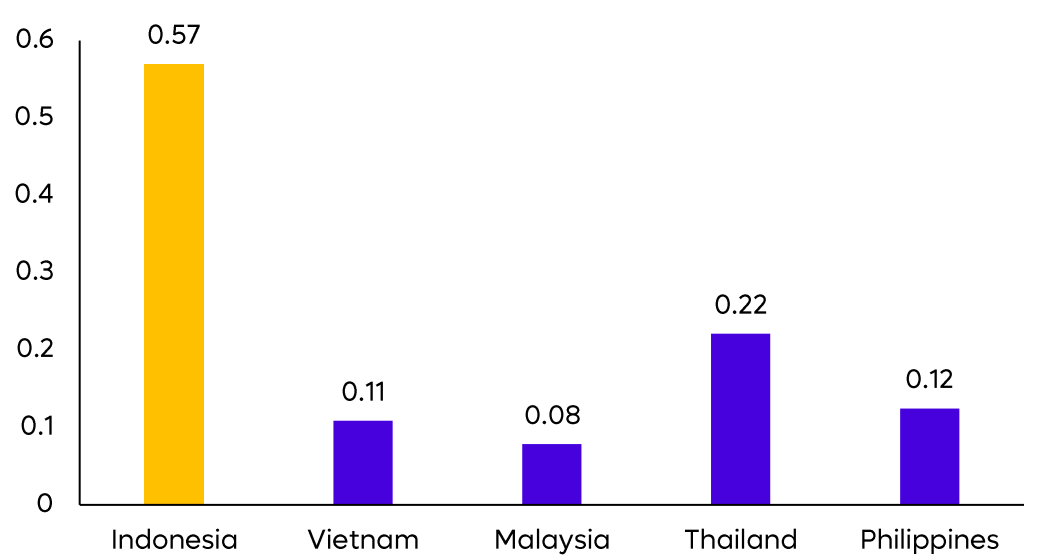
Contribution of Agriculture to GDP as of 2022 (US$Bn)[2]



Farming population as of 2022 (in Mn)[3]



Agriculture Land as of 2022 (in Mn Ha)[4]



1. Pitchbook; 2. FoodIndustry: The Economic Impact of the Agri-Food Sector in SEA; 3. Statista; 4. Grow Asia: Smallholder AgriTech SEA Landscape 2021 and 2022

Agricultural tailwinds that have led to successful business model precedents in India and China

Agriculture Tailwinds

Food security threat
Climate change and labour scarcity due to rapid urbanization while rising demand for food outpaces products[1]

Digitization
Growing smartphone penetration and internet adoption among both consumers and farmers[2]

Supply chain inefficiencies
Covid-19 disrupted supply chains and caused a shift to digital platforms[3]

Favourable govt impetus
Govts reforms to increase farmers' income and build food sufficiency through technology[4]

Consumer preferences
Growing disposable incomes lead to consumers demanding food with specific characteristics (e.g.Organic, traceability)[5]

Due to the following micro tailwinds and Covid-19, there has been an increase in investment in the upstream of the agri-food chain[6]

Business Model*	India	China
Agribusiness Marketplace	DeHaat Seeds to Market; BIJAK	Pinduoduo Inc. Together More Savings More Fun; 大丰收 DFS168.COM
Farmer Advisory/Robotics	Cropin	XAG
Midstream Tech	ninjacart; waycool; Jumbotail	美菜 meicai.cn; 永辉彩食鲜 YONGHUI FRESH FOOD B2B食材服务商

1. FAO: Climate Change and Food Security: Risk and Responses; 2. The Times of India: Are Farmers Really Harvesting the Power of Tech; 3. EY: How Covid-19 Impacted Supply Chains and What Comes Next; 4. OECD: Government Support to Agri is low on Innovation, High on Distortion; 5. Chinese Economic Review: Chinese Consumers' Preference and Willingness to Pay for Traceable Food Quality and Safety Attributes; 6. Pitchbook;

Below are several viable business models that we see in each segment of the value chain

Value Chain	Sector	Description of Typical Business Model	Examples[1]
Farm inputs	Agri Inputs Supply Chain	Providing logistical infrastructure between brand principals, farmer stores/ farmers	AgriAku, Semaai, gokomodo
Farming	Farm Mechanization	Provide autonomous equipment or robotics to assist in automating everyday on-farm tasks	tunasfarm, ARIA
	Precision Agriculture	Optimizes or automates tasks like seeding, irrigating and harvesting using machine learning software/hardware	MERTANI, ARIA
	Farm Management	Provides farmers assistance through a subscription-based software that provides dashboards, insights and monitoring capabilities to increase efficiency	ERATANI, eFishery, aruna, Pitik
Post-production	Agri Output Supply Chain	Online marketplace solutions for agriculture good with a strong supply chain and logistics, connecting farmers, processing plants and consumers	ERATANI, eFishery, aruna, PasarMIKRO, EdenFarm, sayurbox
Across value chain	Pure Fintech	Providing financing solutions or payment infrastructure throughout various stages of the value chain including farmer stores, farmers or traders	CROWDE

1. Crunchbase, Pitchbook (Selected examples; Some may appear in multiple segments due to their expansive coverage in their business model)

Key Success Factors for AgriTech in Indonesia

Closed-Loop System

- Working towards building an **end-to-end integrated solution** to establish a closed loop system through **providing input supplies, financing access** and **output offtake at the end of the harvest cycle**

Farmer-Centric Model

- Business models that provide **direct support to farmers in scaling output** and improve overall yield efficiency
- **Direct access to farmers is crucial** as a market entry into a fragmented value chain

Build out Critical Mass

- Focus on building their presence in certain areas/province by **establishing a strong supply chain network and relationships with key stakeholders** (Community Leaders, Principals, Distributors etc)

Hybrid Offline/ Online Business Model

- Utilize 'fit for purpose' tech- simple mobile applications with **remote, low bandwidth environment operations**
- Offline presence is crucial for **farm management, harvest tracking and farmer education**

 Source: Crunchbase, Pitchbook, Flaticon