



AGRI-STARTUP BUSINESS AND DIGITAL FARMING APPLICATION IN INDONESIA

(Challenges of Technology Based Solutions in the Agriculture Value Chain)

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Introduction

- Today's world has entered the era of connected information societies in the virtual world. Not only in urban areas, this phenomenon is also common in rural areas.
- Farmers in remote villages have begun to take advantage of advances in information technology in meeting their needs.
- The result is a variety of digital applications that are engaged in the agricultural sector.

Introduction

- The developments in Indonesia's digital economy are interesting to watch.
- To mature sectors—such as ride-hailing, e-commerce, and fintech—agriculture is seen as the next big sector in the country's digital industry.
- There are need a study of the existence of digital applications engaged in the agricultural sector.



Agriculture in Indonesia

- ***INDONESIANS DEPEND HEAVILY ON AGRICULTURE***
- Agriculture is a very important sector and vital to the Indonesian economy, accounting for 50% of total employment in 2014 (FAOStat, 2014).
- Agriculture contributing 14% to the country's GDP (World Bank, 2014).
- It is the second biggest contributor to Indonesia's GDP (among the top three contributors to the country's GDP, along with the processing industry and trade).
- Some 33% of the Indonesian working population are in farming, with the majority working less than one hectare (World Bank, 2015, Sensus Pertanian, 2016).
- There are around 32 million people here whose jobs are related to agriculture; there is a huge opportunity to improve its inefficiencies.
- The government's own data suggests the sector to be growing 3.8% YoY, and would surge between 3.9 - 4.1% in 2019

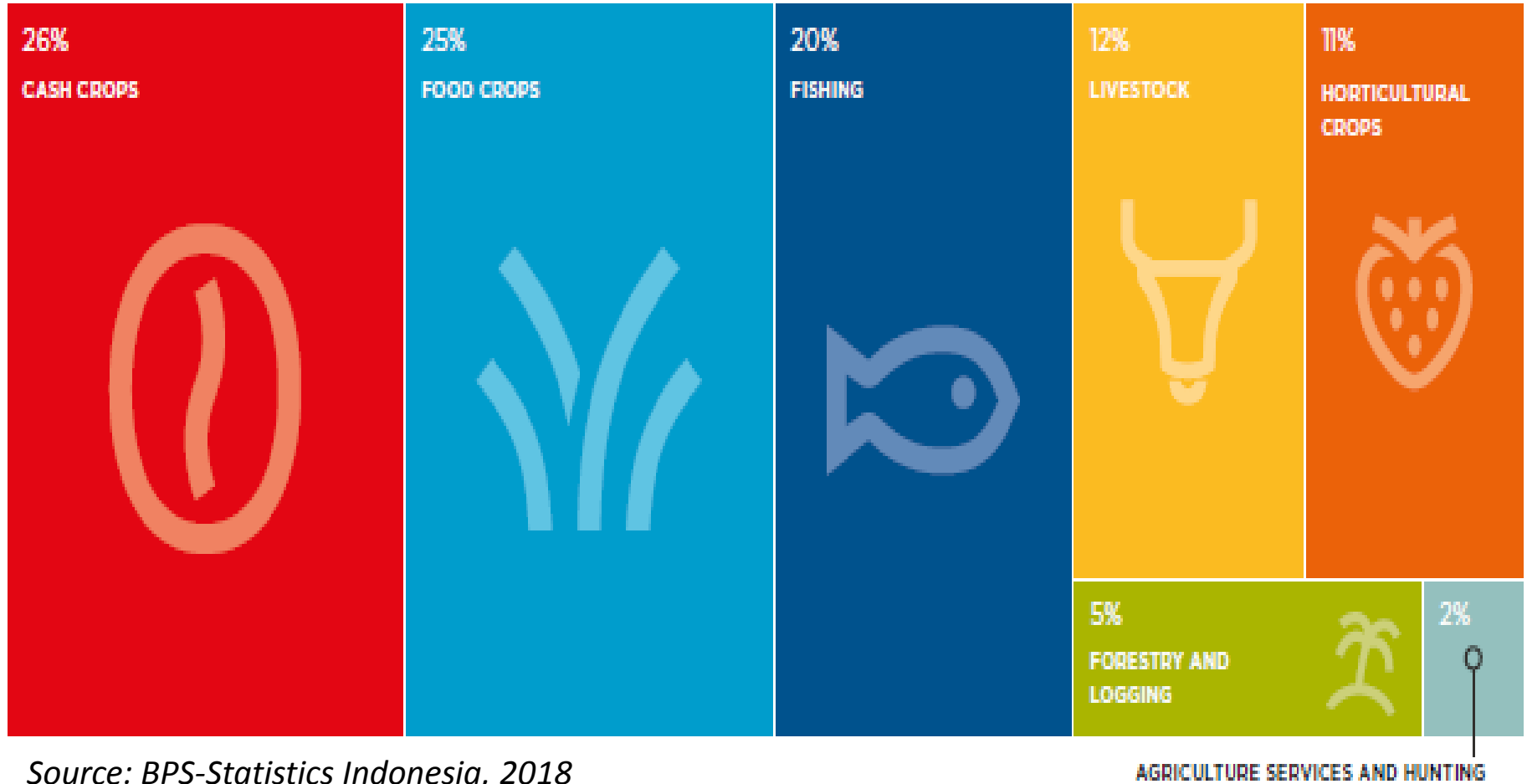
Agriculture in Indonesia

- Indonesia's farmers are faced with various problems
- Most farmers in Indonesia still live in poverty because they have limited access to the market.
- Agriculture has a long chain of middlemen between farmers and consumers, which tends to drive prices up and reduce profits for farmers.
- To their rescue are country's homegrown agri-tech startups
- Improving the agricultural sector with technology, can create more jobs and help economic growth in Indonesia to be more distributed—not concentrated in Jakarta and other big cities only.

The Growth and the Potential (2018)

- Five decades have seen an increasing share of land devoted to agriculture in Indonesia.
- Indonesia's GDP from agriculture industry has increased to IDR 84,578 billion (USD 6.1 billion) in the first quarter of 2018.
- GDP growth of Indonesia's agriculture is estimated to be 4% in 2019.
- Indonesia has spent IDR 30.1 trillion (USD 2,175 billion) for the development of agriculture in 2018.
- Huge water resource that is beneficial for the development of agricultural sector.
- Indonesia imports food from abroad annually, amounting to IDR 53.5 trillion (USD 3,849 billion).

Contribution of agriculture, forestry and fishing to Indonesia's GDP, by sub-sector, 2017



Source: BPS-Statistics Indonesia, 2018

Digital Ecosystem Landscape

- The Communications and Information Ministry recently launched the 1,000 Digital Startup Movement initiative in cooperation with KIBAR, the country's technology start-up ecosystem builder in Indonesia.
- The government wants to realize Indonesia's potential for the Digital Energy of Asia by 2020 through the creation of 1,000 tech start-ups, which are expected to help overcome problems by utilizing digital technology. This initiative should be appreciated, given the global digitalization trend in all aspects of life. *Nonetheless, most of these start-ups have not touched traditional sectors, such as agriculture.*
- The top 15 start-ups in Indonesia are still dominated by e-commerce (TechInAsia). This indicates that Indonesian private consumption is very high. But if we look at the national agricultural sector, the condition is inversely proportional to feed its population.
- In the midst of growing food demand, it is unlikely that the Indonesian agricultural sector will be able to provide sufficient food. Although such start-ups would be identical to those in information technology and digitalization, this does not mean they only dwell in the two realms.
- Many lines of business could be developed by start-ups, including agriculture.

Digital Ecosystem Landscape

- For Indonesia, based on the purpose of the movement and definition of a start-up itself, the role of an agricultural start-up could be crucial.
- The national agricultural industry is still dominated by the home industry, with a total of about 26.14 million households, while the number of agricultural companies totaled only 4,165 (Agriculture Census, 2013)
- The majority of Indonesian farmers are working on a small scale with undeveloped technology and limited access to education and information. If start-ups can work well in agriculture, they will not only grow new companies but also strengthen millions of small farmers in Indonesia.

Digital Ecosystem Landscape

- A decreasing number of industrial farming households. Indonesia has lost about 5 million farmers due a lack of support and low profits.
- The current hype to reinforce agriculture has been taken by some start-ups, which empower local farmers to eliminate the role of brokers while providing professional management. In software development, some application have been established to assist farmers with planting, financial management and agricultural knowledge.
- A new hope since they bring science, digital technology, as well as access to information and global networks for the local farmers to utilize and compete globally.

Digital Agricultural in Indonesia

- Agriculture is upcoming sector looking forward to improving their businesses with IoT.
- Indonesia's agricultural sector is undergoing a transformation, as the next generation of farmers look to new technologies to increase efficiency and productivity.
- The GoI places a high priority on agricultural self-sufficiency. Indonesia's National Development Plan aims to boost its farming capability, production and value-added activities, while reducing commodity imports perceived to replace local produce.
- There is increasing competition for agricultural land from other cash crops and industrial and urban expansion. This means Indonesia is likely to continue to rely on food imports, particularly protein-based foods, regardless of future productivity improvements.
- Indonesian farming has traditionally been hampered by small holdings, limited mechanisation and poor distribution systems. A long supply chain means agricultural products go through a number of middlemen between farmers and consumers.
- Indonesia's farming sector still lacks a proper platform that connects farmers with buyers of their agriculture produce
- Conventional agricultural market used to have a long distribution channel
- With entrepreneurship on the rise in Indonesia, this is about to change. Data from the Central Statistics Agency (BPS) shows there were 26.7 million entrepreneurs in 2016, compared to 22.7 million in 2006, mainly thanks to the digital sector, which has flourished in the past five years.
- Indonesian 'agripreneurs' are transforming the agricultural sector by establishing collectives and using modern farming methods.

Indonesia - Agriculture 4.0 Policy

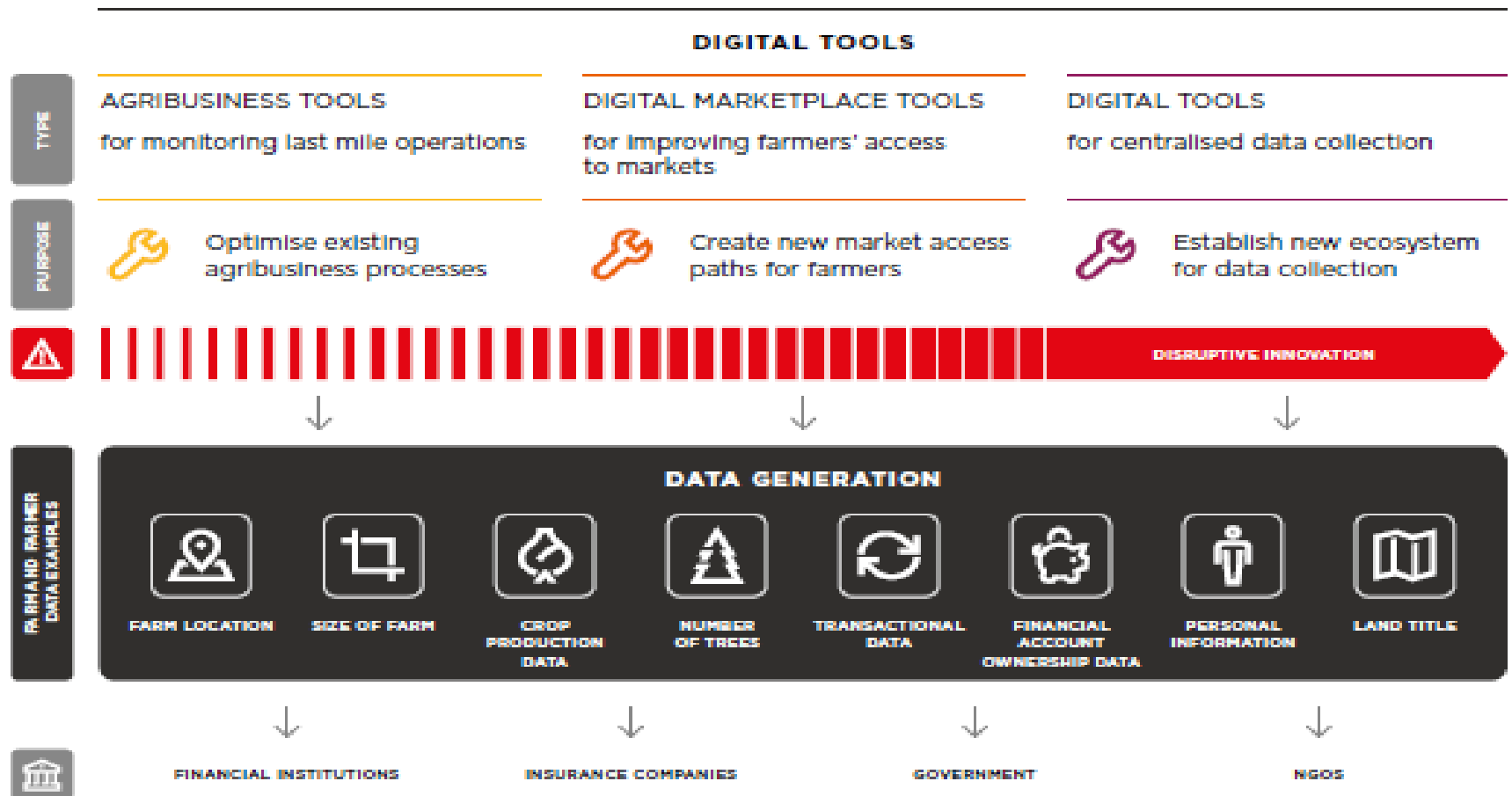
"Farm, field, supply chain, and investors, agribusiness, startups, innovative technology"

- Technology, Innovation and Digitalization are powering agriculture like never before.
- The Smart & Digitalization Farming Indonesia (SDFI) will address implementations in the farm, field and supply chain, and showcase use cases from investors, agribusiness companies, plantation owners, startups and innovative technology developers.
- This strategic and high-level event will focus on the hottest emerging concepts of SDFI, and how their uses in agriculture are changing the game. Covering the full spectrum of agricultural commodities, the programme will help to assess the potential for business, evaluate partnerships and learn from peers.

Digital Agricultural Interventions

Digital tools that generate farm and farmer data

Three main paths of AgTech innovation in Indonesia, led by start-ups focused on three types of solutions:



Why AgTech?



The agricultural application is very beneficial for farmers for various reasons:

- Easy to use and does not require expensive costs.
- Can immediately get feedback directly given the nature of interactive farming applications.
- Easy to get information and market access so that it can increase revenue.
- Virtual farmer group networks can be formed that connect many parties.

Agri-Start Up in Indonesia

The fast-growing Indonesian agtech startup environment is also creating and applying new technologies, with many of them developed at the country's universities.

Some of Indonesia's leading agtech startups:

- [CiAgriculture](#), a spin-off of Indonesian data analytics firm Mediatrac
- [TerralogiQ](#) offers geospatial data analytics for real-time tracking of objects and people in Indonesian plantations
- Open-source Internet of Things and machine-to-machine platform provider Libelium is working with Indonesian cocoa farmers to deploy wireless Waspote sensors in conjunction with cloud analytics to improve cocoa production and profit margins
- Universitas Gadjah Madah Agricultural Technology Faculty has launched AiRi – wireless sensors for nutrients, soil moisture and microclimate analysis
- Agricultural polytechnic Institut Pertanian Bogor's [incuBie](#) incubator assists small-scale agribusiness and agricultural entrepreneurs
- [Petani](#), [LimaKilo](#) and [TaniHub](#) provide farmers with information on farming techniques and equipment, commodity prices and online marketplaces
- Cybreed has an [eFishery](#) app which integrates software in a smart feeding system
- [Eragano](#) developed a price, finance and online marketplace app for small landholders
- [iGrow](#) brings together underemployed farmers, under-utilised land and investors to produce high-quality organic food
- [100integrity](#) provides real-time weather and agronomic data
- [FAM Organic](#)
- [Cibadak Agri](#)
- [AgriSocio](#)
- [Javara](#)
- [Sayurbox.com](#)



Direct Trading for Farmers

- Directly connecting farmers to their end users (Hotel/Restaurant/Cafe/Catering)
Efficiently delivering agriculture product using supply chain management
- Get the Fresh Vegetables directly from farmers





\$ 90,000

TOTAL REVENUE

120 ++

FARMERS IMPACTED

250 Tons

FRESH PRODUCE
DELIVERED

35 ++

HAPPY CUSTOMERS



Market Access

Directly connecting farmers to end customers, which we address is Hotel, Restaurant & Catering. Knowledge & information sharing of the markets demands, both in quantity & quality.



Standard Procedure

Standardize farmers working procedure, using only proven best practices. Practicing effective & Efficient farming.



Fair Pricing

The fresh produce will always bought at the fair price based on production cost. So the farmers get stable & fair price and always get a profit from their selling.

AWARD

SDBT 2016

Solusi Desa Broadband Terpadu by Kominfo. We are winner in top six for the category of farmers empowerment.

BEKRAF PITCH DAY 2016

Bekraf Pitch Day competition 2016. We are top 25 finalist for the main event held in Bali, November 2016.

STARTUP WORLD CUP 2017

Startup World Cup by Fenox VC 2017. We are wildcard winner in national round top three.

IMPACT ACCELERATOR PROGRAMS

Three months Impact Accelerator Programs by Kinara Indonesia and Patamar Capital.

GNB ACCELERATOR

Three months Accelerator Programs by Fenox VC and Infocom.



FAM Organic



Founded in 2009, FAM is a family business that started with a 3,500 square meter farm located in Karyawangi Village, West Bandung. It soon expanded to an organic movement that encourages people to not only consume organic vegetables, but also plant it too, wherever they may be. Customers can purchase both the farm produce (vegetables, microgreens, etc) and also tools and supplies to start the garden.

8villages

8villages platforms enable rural people to ask questions and share information about agricultural matters with experts and agricultural practitioners through [lisa.id](#), urban consumers can connect and make purchases directly with rural communities by accessing [regopantes.com](#), and can manage logistics and more practical warehousing with the help of [vlogs.com](#).

Companies in urban areas which have business significance with rural communities can easily acquire survey data on detail occupation, land, and crop yields of the rural communities in certain areas with [datahub.id](#).





HARA

Creating jobs for everyone with a mobile phone

- HARA is a blockchain-based data exchange for the food and agriculture sector that has been operating since 2015. HARA provides farmers and other players in the agricultural sector with valuable data.
- HARA has acquired usually hard-to-find data such as farmer, land, weather data in different provinces across Indonesia. This data is beneficial for institutions across the sectors to make data-driven decisions.
- HARA connects rural smallholder farmers with banks, insurance companies and input producers through data, by simply sharing the usually hard to obtain data. With this ecosystem, good information is the basis for inclusion.
- HARA has successfully helped digitize loan administration and disbursement process of several financial institutions. Also, the data from HARA has been used in market research reports to provide reliable information on the rice production in Indonesia.
- HARA Field Agents “Agripreneurs” are bridge to the farmers in the field. They are rewarded to collect data and to connect farmers with the market.

HARA *Creating jobs for everyone with a mobile phone*



Farmers
19.5K



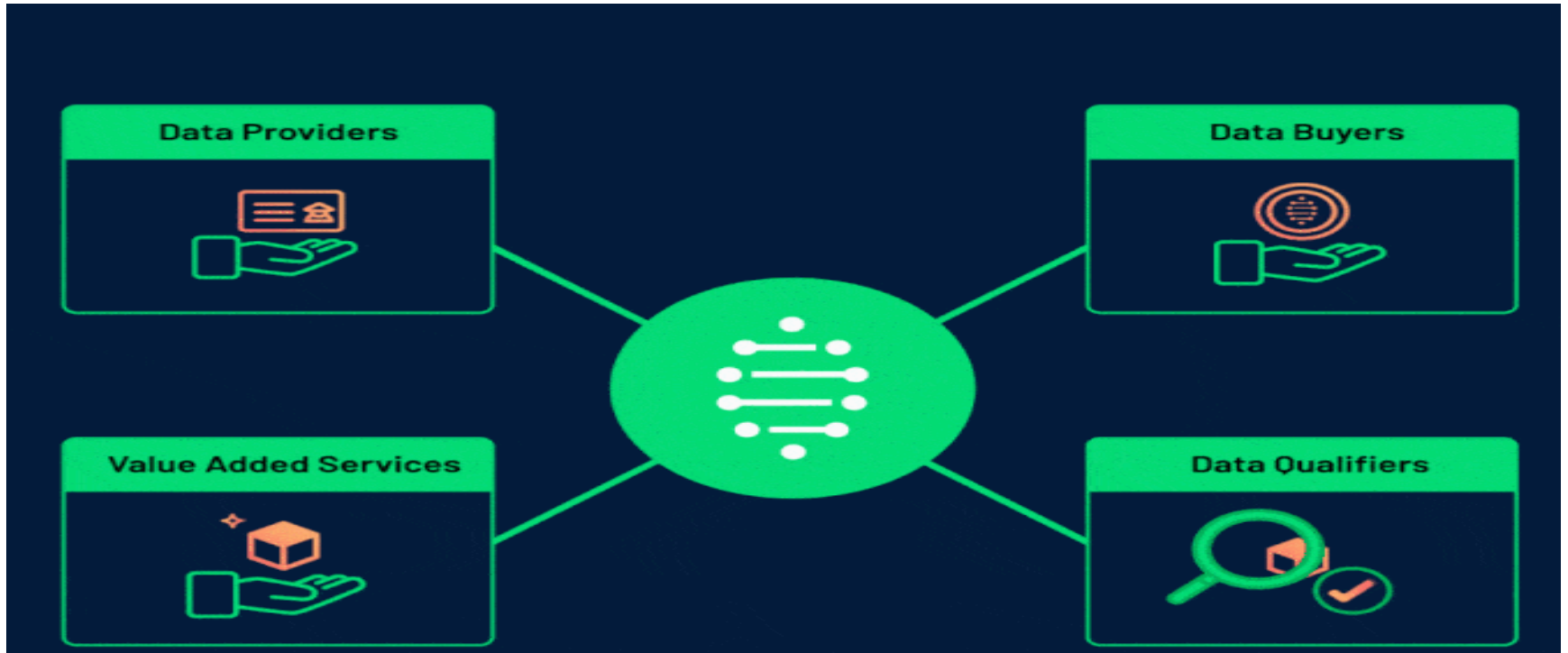
Villages
212



Area (Ha)
4.6K



Microloans (billion IDR)
1.7B





iGrow

- iGrow, founded a year earlier in 2014, has made a name for itself in the agribusiness investment sector. iGrow users pay to "sponsor" the cultivation of a unit of produce. For IDR 1.5 million, investors in an iGrow precision farming project are entitled to the returns from one square meter of crops cultivated in a greenhouse.
- iGrow collectively plug the financing gap for small-scale agribusinesses, offering valuable, alternative sources of liquidity to a sector that employs 40% of Indonesian's citizens in low-income jobs.
- Without access to conventional loans, needy unbanked farmers often resort to illegal "loan shark" moneylenders who demand exorbitant interest rates. Many also fall prey to exclusive middleman arrangements that force them to sell their produce at punishingly low prices. iGrow centrally sources for bulk buyers to ensure farmers receive a fair rate, which in turn stabilizes farm prices and gives farmers a much-needed income boost.



iGrow

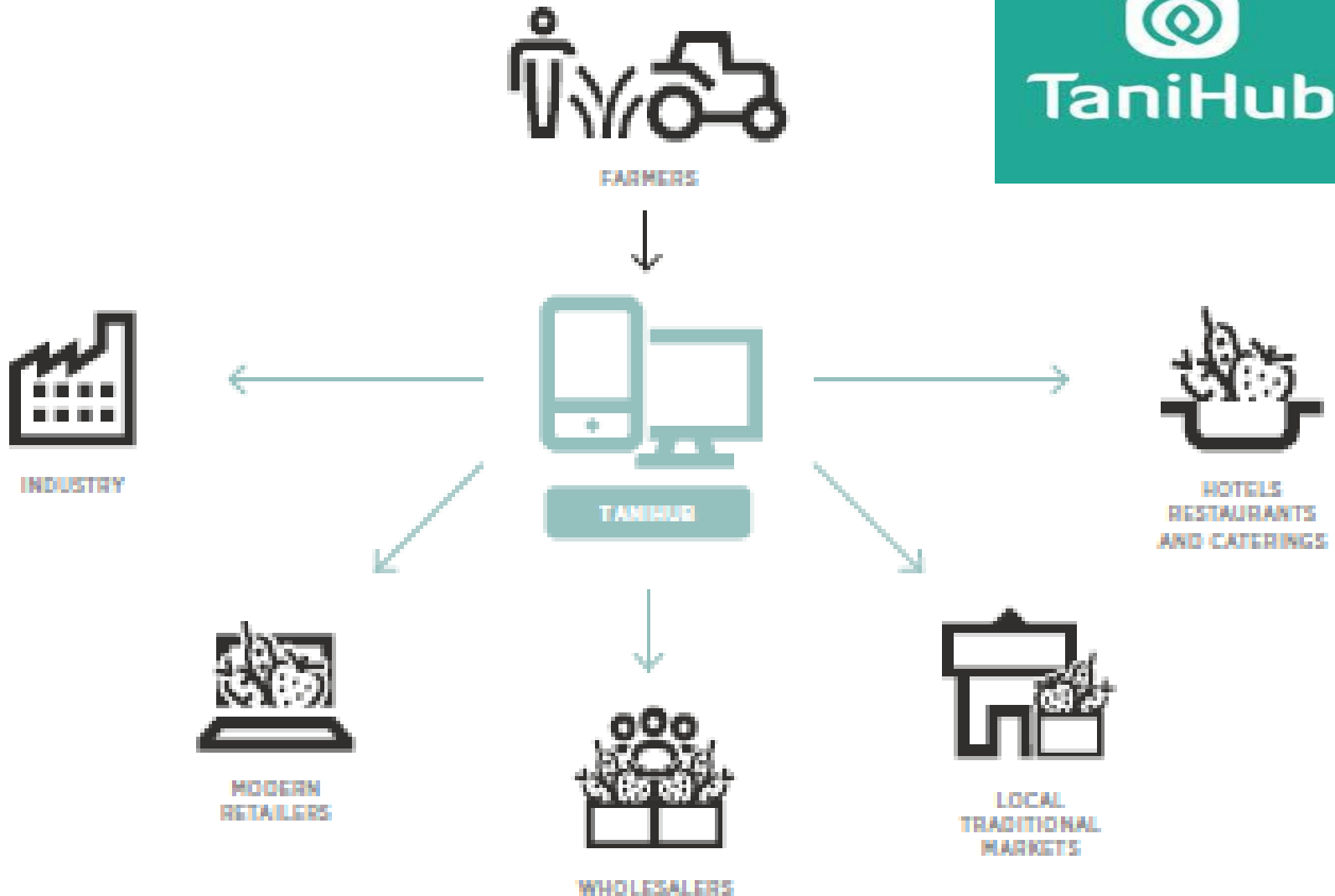
- iGrow is a peer-to-peer lending platform for contract farming. iGrow offers crop sponsorship package as an alternative investment instrument. Get profit from real life farming in your pocket!
- iGrow helps under employed farmers (7.500 Farmers) and under-utilized land to produce scalable and efficient organic farm (2,500 hectras) funded by urban people around the world.
- Connect farmers, landowners, and the investors to create food organic plantation, and sell the crops directly to the customer like the highly networked supermarket.
- Build the world's largest high-quality organic farm funded by urban people by making our world a better place.

TaniHub

- Tani Group is a startup company engaged in agricultural technology. Tani Group consists of two business lines, TaniHub and TaniFund. TaniHub is a business-to-business e-commerce for agricultural, livestock, and fishery products. TaniFund is a crowdfunding for agricultural cultivation program.
- Established in mid-2016, TaniHub has succeeded in helping market various agricultural products both inside and outside the country. TaniFund (2017) has channeled more than IDR 20 billion to 34 online & offline projects.
- Tani Group is disrupting agriculture, one of Indonesia's key economic sectors
- In 2015, TaniFund & TaniHub become the First Indonesian Startup to Collaborate with International Finance Corporation



TaniHub's –Bussines Model



- Shrimp farming, it's not easy
- Shrimp disease has been an issue for many years, leading to uncertainty in shrimp production. Even though shrimps are a very lucrative product, it has a high risk of failure if the farm is not being taken care of appropriately.
- JALA empowers shrimp farmers to increase their yields through technology and smart data. JALA monitors water quality on shrimp ponds and this data can be accessed online real-time. The risk of harvest failure is minimized this way. Reliable analysis on water parameters are also provided in the web-app to help farmers effectively manage and treat their ponds in time.



CROWDE



- A crowd-investing platform for sustainable agriculture projects that connects small-scale farmers with retail investors through its digital platform. It is targeting small-scale community based farmers who are not able to get a loan from traditional bank (not bankable projects).
- Crowde joins a growing number of crowdfunding and peer-to-peer (P2P) lending startups offering investors the once rare opportunity to invest directly in Indonesia's agribusinesses.
- Crowde's platform offers small investors direct access to Indonesia's US\$25 billion agricultural sector, transforming the way traditional farmers fund, run and grow their businesses
- With over 23,000 investors on its platform so far, the startup channelled a total of IDR 51 billion (US\$3.63 million) in 2018 to over 10,000 partner farmers and enterprises who list their projects – which range from crop cultivation to rearing farm animals and sourcing of farm supplies – on the Crowde platform.
- The targets novice investors who do not have much spare capital or are new to the crowdfunding scene. The minimum investment required is a relatively low IDR 10,000 (US\$0.70) per project.

Karsa

- Karsa is an [Android app](#) dedicated for Indonesian farmers. It connects farmers with the suppliers, producers, consumers, and the government. Considering many farmers located in rural areas, it might be a bit difficult for them to gain useful information from the government and to distribute their crops. Therefore, a mobile app like Karsa is convenience to meet their needs.



Few Benefits from Mobile Application for Farmers

- **Weather Forecast :** With GPS track, farmers can predict the weather based on their field location. This will help them to anticipate drought season or wet season. Usually the farmers will plant the crops according to the season for optimum harvest.
- **Harvest Prediction:** Based on the planting time and type of crops, the app will predict the harvest time. Therefore the farmers can make the farm plans and control the crops distribution to the suppliers.
- **Pests and Diseases Control:** Farmers can connect with the agricultural materials supplier to arrange which materials they need. This include the arrangement for pest control and other fertilizers. Agriculture specialists (from the government bodies or NGO) can also give more information about disease control and how to avoid them.
- **Market Price Information:** The government can also contribute in this app to give more information to the farmers, or national announcement for specific case. This includes the national market price, crops distribution, or any details that will be needed. This will stabilized the market price and avoid illegal wholesaler for national crops.

Challengges – the Agri-Startup

- The current start-up trend, which is dominated by the service sector and sales.
- Comprehensive policy support, ranging from licensing issues, access to capital and incentives, is needed. Licensing facilities are in line with the government's goal to improve its ranking in ease of doing business.
- Access to capital is not just about access to banks but also the ease of investment. A government-established incubator is a good starting point because it facilitates access to capital and advocates for policy support.
- The approach to farmers and local administrations. Literacy technology, particularly in IT for farmers, is very important. Without it, they cannot use the services and software provided by start-ups.
- Local government support is also crucial since they are dealing with farmers and the locus of agriculture. For example, cooperation between start-ups and local administrations to arrange village funds to develop agricultural products and empower farmers. Without involving farmers and local governments, agricultural start-ups will only be a discourse at the urban level.

Challenges– the Agri-Startup

- A few things need to be undertaken, starting with building awareness and providing knowledge about the needs of start-up farming. It is important for founders, investors and public officials to understand the necessities of agricultural start-ups.
- However, keep in mind a few things before developing this digital application. Both developers and governments must work together to progress their use, including in preparing infrastructure.
- A massive campaign also needs to be carried out in introducing these applications, so that farmers can broadly know and use them

Conclusion

- Conventional agricultural market used to have a long distribution channel. By using the local startup technology company, Indonesian farmers today easily sell their products and consumers easily get fresh products as well.
- With the system, it can cut the long distribution chain from farmers to consumers, the price of fruit and vegetables are cheaper, provide special offers (discounts and price cuts voucher).
- The Agri-stratup is not only beneficial for consumers but also can improve farmers' welfare to help them to get a better life and also support government by stabilizing price & supply.

Promoting transparency starting in the food and agriculture sector

[HTTPS://WWW.YOUTUBE.COM/WATCH?V=A42KXHSX4XW&FEATURE=YOUTU.BE](https://www.youtube.com/watch?v=A42KXHSX4XW&feature=youtu.be)



Thank you
Vielen Dank
Спасибо