THAILAND’S EVOLVING ECOSYSTEM SUPPORT FOR TECHNOLOGY STARTUPS
Sakdipon Juasrikul and Paul Vandenberg
SEPTEMBER 2022
THAILAND’S EVOLVING ECOSYSTEM SUPPORT FOR TECHNOLOGY STARTUPS
Sakdipon Juasrikul and Paul Vandenberg
SEPTEMBER 2022

Country Report No. 4
Ecosystems for Technology Startups in Asia and the Pacific
## Contents

Tables and Figures ........................................................................................................................... iv  
Foreword ........................................................................................................................................ v  
Acknowledgments ........................................................................................................................ vi  
Abbreviations ................................................................................................................................ vii  
Executive Summary ........................................................................................................................ viii  

1. Overview ..................................................................................................................................... 1  
   1.1 Formation of the Startup Sector .......................................................................................... 2  

2. Recent Analysis of the Ecosystem ............................................................................................... 4  

3. Four Sectors ................................................................................................................................... 7  
   3.1 Cleantech .......................................................................................................................... 7  
   3.2 Edtech ....................................................................................................................................... 8  
   3.3 Agritech ...................................................................................................................................... 9  
   3.4 Healthtech ............................................................................................................................ 10  

4. Key Ecosystem Factors That Support and Restrain Startups in Thailand ................................. 11  
   4.1 Finance and Investment ........................................................................................................ 11  
   4.2 Government Policies, Programs, and Regulations .............................................................. 15  
   4.3 Digital Infrastructure .......................................................................................................... 19  
   4.4 Human Capital .................................................................................................................. 20  
   4.5 Incubators and Accelerators .............................................................................................. 22  
   4.6 Other Ecosystem Factors .................................................................................................... 24  

5. Future of Tech Startup in Thailand .............................................................................................. 26  

References ........................................................................................................................................ 27
Tables and Figures

Tables
1  Support and Obstacles in Thailand’s Entrepreneurial Ecosystem ........................................ 6
2  Thai Investors and Investment Landscape .............................................................................. 12
3  Advantages and Disadvantages of Regulations and Policies to Support Thai Startups ............. 16
4  Acceleration Program in the Thai Startup Ecosystem ................................................................. 23

Figures
1  Number of Startup Investments and Total Value, 2012–2021 ....................................................... 3
2  Number of Investments and Startups Receiving Investment by Sector, 2001–2022 ...................... 3
3  Average Score of Thai Entrepreneurial Ecosystem by Dimension and Stakeholders’ Perspective .... 5
4  Investors in Startups, 2012–2021 .................................................................................................. 12
The business landscape in Asia and the Pacific is changing rapidly due to the increasing importance of technology-based startup enterprises—or tech startups. These disruptive companies offer new products and services through the creation and application of innovative technologies. Tech companies such as Ant, Byju, Flash, Gojek, and Joi are among the leading enterprises in Asia’s emerging economies. Not all startups will survive, but those that do provide technology and dynamism that are important for economic growth.

Given their growing importance, it is essential to better understand the ecosystem in which tech startups develop. They need access to venture capital and other forms of finance; talented technology and business professionals; efficient digital networks; and supportive government policies. A strong ecosystem is critical to transforming new ideas into commercially viable businesses.

This report assesses the state of tech startups in Thailand with a focus on the ecosystem. It examines the extent to which the system supports the growing number of startups in the country. The report focuses on four sectors: cleantech, edtech, agritech, and healthtech. While fintech and e-commerce startups are more prevalent in Thailand and other countries, these four sectors were chosen because startups in these sectors not only become successful businesses, but also have a strong impact on development. They support human capital formation (education and health) and the large and largely poor rural sector (agritech). Cleantech, also known as greentech, contributes to environmental sustainability and climate change mitigation.

The report provides suggestions on how stakeholders, including the government, can strengthen the ecosystem to help tech startups flourish in Thailand.

Albert Park
Chief Economist
Asian Development Bank
Acknowledgments

This report was prepared by Sakdipon Juasrikul (University of the Thai Chamber of Commerce) and Paul Vandenberg. The latter, along with Aimee Hampel-Milagrosa and Matthias Helble, guided the research project. Rana Hasan and Lei Lei Song provided direction and management support. Glenita Amoranto provided research support. The Asian Development Bank’s Thailand Resident Mission reviewed the report and helped solicit comments from the Government of Thailand.

The authors would like to thank key experts from government, incubators, accelerators, development partners, investors, academic institutions, and startups who provided invaluable insights that were used in the preparation of this study. The draft report was reviewed by the Digital Economy Promotion Agency, under the Ministry of Digital Economy and Society. Tuesday Soriano copyedited the report, and Amanda Isabel Mamon provided administrative support, contracting, and manuscript management.
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIS</td>
<td>Advanced Info Service</td>
</tr>
<tr>
<td>CVC</td>
<td>corporate venture capital</td>
</tr>
<tr>
<td>DEPA</td>
<td>Digital Economy Promotion Agency</td>
</tr>
<tr>
<td>IoT</td>
<td>Internet of Things</td>
</tr>
<tr>
<td>MDES</td>
<td>Ministry of Digital Economy and Society</td>
</tr>
<tr>
<td>NIA</td>
<td>National Innovation Agency</td>
</tr>
<tr>
<td>NSC</td>
<td>National Startup Committee</td>
</tr>
<tr>
<td>NSTDA</td>
<td>National Science and Technology Development Agency</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>research and development</td>
</tr>
<tr>
<td>SMEs</td>
<td>small and medium-sized enterprises</td>
</tr>
<tr>
<td>VC</td>
<td>venture capital</td>
</tr>
</tbody>
</table>
Executive Summary

The report analyzes the ecosystem of support for tech startups in Thailand. Tech startups are young enterprises with an innovative technology, often digital, that seek to scale up rapidly. The ecosystem consists of factors in the business environment that can help (and might hinder) startups to launch, grow, and scale up. These factors include venture capital, digital infrastructure, government policies, incubators and accelerators, and a skilled workforce. A culture of innovation and risk-taking is also important. In addition, the ecosystem includes market demand for the goods and services that startups provide. Demand can make the difference between a venture's success and failure.

The study focuses on four sectors: cleantech (environment), edtech (education), agritech (agriculture), and healthtech (health). These sectors are not the dominant tech sectors in Thailand—fintech and e-commerce are. However, they not only contribute to economic activity, but also support important development goals. Edtech and healthtech build human capital, and agritech provides innovation for farming, the occupation of most low-income households. Cleantech, also known as greentech, improves environmental sustainability and mitigates climate change.

The startup sector in Thailand began to emerge in the 2000s with clusters of small software firms. They developed organically and often struggled as their founders experimented with new business models. They initially received little attention from the government. In 2011, Advanced Info Service (AIS), a telecommunication company, organized the AIS Startup Weekend to promote the idea of startups in Thailand and identify business partners for digital innovation.

By the mid-2010s, the government began to realize the importance of startups and the contribution they can make to the economy. Policy makers also began to recognize that startups require a different type of support than traditional small and medium-sized enterprises.

The Ministry of Digital Economy and Society (MDES) was created in 2016 from the former Ministry of Information and Communication Technology. The National Startup Committee was also established to generate ideas for improving the ecosystem. A year later, the new Digital Economy Promotion Agency was created under MDES with a mandate to support startups. The government-organized Startup Thailand 2016 event was another important milestone in raising awareness of tech startups in society.
While startup activity has increased substantially since the mid-2010s, the four sectors analyzed in this study have experienced more modest expansion. These sectors attract less venture capital and support for several reasons. They often offer products rather than services that must be manufactured and require advanced manufacturing capability. In addition, product development takes time, while venture capital seeks short gestation periods and quick returns. Patient capital is needed for these four sectors.

Weak market demand limits the emergence of more startups in the four sectors. The education market is constrained by low-income households in rural and peri-urban areas. The same is true for aspects of healthtech. Poor farmers lack the resources and willingness to adopt new innovations in agritech. Furthermore, a significant portion of the market for the four sectors consists of public institutions such as schools and hospitals. Innovations offered by startups must be approved by the government and go through public procurement procedures, which can be difficult and time-consuming.

The complexity of innovation in Thailand remains limited. There are few examples of what is known as “deeptech.” It is not clear how this can be fostered, but spin-offs from the country’s good technology- and science-based universities and research institutes could be increased.

A range of incubator and accelerator programs have emerged, initiated by government agencies, universities, or the private sector. Many are partnerships between these three actors. A better understanding is needed of the type of programs or program components that provide the best support to startups.

General incubator and accelerator programs can provide generic guidance, but sector-specific programs are better because they offer detailed advice on product development, markets, and marketing. Thailand is home to the first dedicated edtech accelerator in Southeast Asia. In addition, Space-F, the country’s first foodtech incubator and accelerator, was established as a three-way partnership between the National Innovation Agency, a university, and a private food company. The Global Cleantech Innovation Program, a training program for startups, was established by the government and a United Nations agency.

The government has created a supportive policy environment, but some policies could be reviewed. The 5-year income tax exemption is good, but since many startups are not yet profitable during this period, it does not provide much support. In addition, startups cannot issue convertible bonds, but this would be an additional tool for early-stage financing if they could. Startups cannot set up an employee stock option plan, which is a useful way to both limit cash payments when funds are tight and incentivize employee commitment to achieving enterprise success.

In cleantech, many innovations are hardware technology products (i.e., new machines) that require expert design and engineering. Cleantech startups, however, are often unable to develop good product design because they lack the engineering expertise needed to bring their products to market.
In agritech, the willingness of farmers to adopt new technologies is a critical factor in the growth of startups. However, many farmers are not technologically advanced and cannot or do not want to embrace the innovations offered by startups. The digital literacy of many farmers remains low. These characteristics are particularly true for the older generation of farmers. However, agritech startups are likely to continue to grow since Thailand has strong country-specific advantages in agriculture. Large agriculture and food processing firms appear to be driving the demand for agritech solutions.

In healthtech, solutions include medical devices and pharmaceutical products which face difficulty with testing and meeting product standards. This is due to the lack of expertise by regulators and the originality of some solutions (i.e., a standard may not exist for a product that is new to the market).

Several dedicated healthtech incubators and accelerators have emerged. Some are sponsored by insurance companies given the strong link between health and insurance. Property developers are also interested in supporting healthtech because of the link between housing and clean living. At least one venture capital fund has been established linking healthtech, prop(erty)tech, and livingtech. Healthtech startups benefit from research grants and government procurement programs. Some evidence suggests that healthtech startups are the least active in seeking venture capital—investors have funds available but receive few offers.

There are few startup founders who have both entrepreneurial skills and technological expertise, especially in cleantech. Many startups are initiated by researchers and professors who need to improve their understanding of business and entrepreneurship. Mentors and role models are still relatively scarce—because the startup community is still young.
Technology-based startup enterprises are driving innovation and growth in countries around the world. Startups are young enterprises with innovative technology and an adaptive business model that have the potential to scale up rapidly. Steve Blank (2010, 1), a leading expert, defines them succinctly as new ventures that devise a “repeatable and scalable business model.” They are changing the way economies work and offer hope for more rapid development in emerging economies.

Startups operate in an ecosystem that includes financiers, digital infrastructure, government policies and programs, incubators and accelerators, and other organizations and players. A supportive ecosystem gives startups a greater opportunity to establish and grow. In recent years, the Government of Thailand, like governments around the world, has worked to create a supportive ecosystem.

Since 2015, startups have become an additional growth engine for the Thai economy, attracting the attention of stakeholders including government, large corporations, academic institutions, and investors. Various activities and programs have been initiated to catalyze a vibrant ecosystem. However, more can be done to increase the number and variety of startups, especially in sectors beyond fintech and e-commerce, and to engage with more sophisticated technologies known as “deeptech.”

This study examines the tech startup ecosystem in Thailand. It explores the supportive and constraining aspects of the system and the nature of the startups themselves. It provides suggestions for improving the ecosystem. The study focuses on cleantech, edtech, agritech, and healthtech because they not only contribute to economic growth but also have an impact on broader development goals by protecting the environment, building human capital, or supporting low-income farmers.
1.1 Formation of the Startup Sector

Clusters of small software businesses formed organically in the 2000s. Many struggled to grow and experimented with different business models. Initially, they received little attention from the government. This was the beginning of the startup sector. In 2011, a large telecommunication company initiated the AIS Startup Weekend to seek business partners for digital innovation and, more generally, to foster networking and raise the profile of startup activities. The event began to popularize the term “startup” in Thailand. By the mid-2010s, the government recognized the potential importance of startups to Thailand, in part by acknowledging the success of Silicon Valley and other ecosystems. The minister of science and technology asked a small group of startups to discuss and plan the development of the domestic ecosystem—the beginning of public–private partnership in the sector.

Startup Thailand 2016, a government-organized event, was another crucial milestone in raising awareness of tech startups and bringing the sector together. The event spurred the formation of new startups and highlighted the government’s emerging support for the sector. In 2016, the Ministry of Information and Communication Technology was reformed and renamed the Ministry of Digital Economy and Society (MDES). That same year, the National Startup Committee (NSC) was established to find ways to improve the ecosystem. The Software Industry Promotion Agency was also established and supported startups with coworking space and digital infrastructure. In 2017, the Digital Economy Promotion Agency was created under the MDES.

The number of startups receiving investment grew more than tenfold between 2012 and 2021, from 4 to 57 (Figure 1). The number of venture capitalists, angel investors, and corporations investing in Thai startups expanded in tandem. The value of investments in startups increased a hundredfold from $3 million in 2012 to $311 million in 2021. A variety of incubator and accelerator programs were established by both the public and private sectors to meet the growing need for startup support.

Since most startups emerged from small software enterprises and programmers, they are concentrated in digital services. The top three subsectors to receive funding are fintech, e-commerce, and business solutions (Figure 2). The four sectors that are the focus of this study are also represented: edtech ranks 5th; foodtech, which is related to agritech, ranks 8th; and healthtech ranks 12th. Cleantech does not appear in the top 20 (sectors with fewer than 12 deals are not included in the figure). Because the startup community is still at an early stage of development, few enterprises are engaged in deeptech, which is recognized by the government and corporations. Several startups have “harvested” their investments through mergers, acquisitions, and initial public offerings. From 2011 to 2018, a total of 12 startups harvested their investments (Techsauce 2019).
Figure 1: Number of Startup Investments and Total Value, 2012–2021


Figure 2: Number of Investments and Startups Receiving Investment by Sector, 2001–2022

MICE = meetings, incentives, conferences, and exhibitions.
Note: Healthtech includes med(ical)tech; 14 sectors with fewer than 12 deals each are not shown.
A supportive ecosystem is vital for nurturing entrepreneurship and creating new startups (Berger and Kuckertz 2016). The term “ecosystem” is derived from “ecology,” which studies the interactions between organisms and their environment. The term was introduced in the study of Silicon Valley by Bahrami and Evans (1995) and is similar to the idea of an “entrepreneurial system” as a collection of actors, roles, and environmental factors that interact to determine entrepreneurial performance (Spilling 1996).

Entrepreneurship, which is a driving force of startups, is a local phenomenon, and ecosystem development should be understood in the local context (Motoyama et al. 2014). For example, the Global Startup Ecosystem Report 2019 defines an ecosystem as “the concept of a shared pool of resources, generally located within a 60-mile (100-kilometer) radius around a center point in a given region” (Startup Genome 2019, 180). Thus, an ecosystem combines the idea of a location and a pool of resources.

In the mid-2010s, the vibrance of Thailand’s ecosystem was assessed by Juasrikul (2016) using a four-indicator framework (density, fluidity, connectivity, and diversity) from Bell-Masterson and Stangler (2015). Juasrikul also used a stakeholder framework to understand entrepreneurial systems that include universities, governments, corporations, risk capital, and entrepreneurs (Budden and Murray 2019).\(^1\) His study surveyed 211 stakeholders in the ecosystem. The key findings are shown in Figure 3. Corporations, entrepreneurs, and risk capital were found to be strong stakeholders in the ecosystem, while government and universities were considered weaker. In terms of dimensions, the Thai ecosystem scored well in terms of diversity, fluidity, and connectivity, but was weak in density. The startup community had not yet reached critical mass.\(^2\)

---

1. Since 2012, the Massachusetts Institute of Technology’s framework has been employed and developed in the [MIT Regional Entrepreneurship Acceleration Program](https://www.mitrea.org), which has engaged stakeholders around the world.
2. Density dimension refers to how many entrepreneurs are in a given city or region, which is measured by new and young firms per 1,000 people, share of employment in new and young firms, and sector density.
The National Science Technology and Innovation Policy Office and the Thailand Tech Startup Association also conducted an ecosystem survey (NXPO and TTSA 2017). The results showed that the top five sectors at the time were lifestyle; transportation, logistics, and fintech; marketing; travel and tourism; and e-commerce. About 58% of startup founders indicated that ecosystem support was inadequate. Additional support was needed for networking, client acquisition, knowledge sharing, and trade shows. In addition, 51% of founders sought a wider range of financing instruments, including equity, crowdfunding, and convertible bonds. Founders indicated that startups face three major obstacles: government regulation, a lack of human talent, and inadequate access to capital. The strengths of the ecosystem were the availability of mentors who were successful entrepreneurs and a strong payment system.

The study also found that one-third of startups use advanced digital technologies such as artificial intelligence, machine learning, virtual and artificial reality, big data, and the Internet of Things. Of 215 startups surveyed, 22% owned patents or had patents pending. For the startups without patents, the main reasons were that (i) they did not have patentable technology; (ii) it was not necessary for the business; and (iii) they considered it a complicated process to secure the patent. The survey also found that Thai startups have an average of three to four founders, with more male than female founders. The average age when a company is founded is 33. The average number of employees when a startup is launched is four, increasing to six after 2 years. The survey also found a shortage in three types of talent: technology experts (developers, programmers, and data scientists), researchers, and marketers.
A later study found a broader range of startups emerging, with edtech, traveltech, and healthtech moving into the top five sectors (NXPO 2018). Evidence of greater sector diversity is also found in the formation of new associations. In 2014, the Thailand Tech Startup Association was established as the first representative body for startups, followed 2 years later by the Thai FinTech Association and then the Thai Health Tech Trade Association.

A more recent study based on extensive interviews with the full range of ecosystem players found that the system improved significantly when government agencies began to engage, and other actors played their role (Sukpanich and Juasrikul 2019). However, the study also found areas for improvement. First, some government policies and activities overlapped. For example, Startup Thailand, led by the National Innovation Agency (NIA), and Digital Big Bang, led by the Digital Economy Promotion Agency (DEPA), target the same startups. Second, some organizations needed to improve their efficiency. And third, the information provided was occasionally unclear to stakeholders. The lack of a clear definition for startups was also not helpful. Some government agencies lump startups together with more traditional small and medium-sized enterprises (SMEs) in designing policies and programs.

Finally, an assessment of Thailand’s ecosystem in terms of both supporting and hindering factors can be made, drawing on two global sources, the Global Entrepreneurship Monitor and the Global Entrepreneurship and Development Institute (Table 1). Supportive factors include culture and opportunity, startup skills, market dynamics, and others. Obstacles include shallow technology depth, limited internationalization, little early-stage funding, and others (Table 1).

### Table 1: Support and Obstacles in Thailand’s Entrepreneurial Ecosystem

<table>
<thead>
<tr>
<th>Support Factors</th>
<th>Obstacle Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Startup skills and opportunity perception</td>
<td>• Limited ability to internationalize</td>
</tr>
<tr>
<td>• Acceptance and culture of entrepreneurship</td>
<td>• Lack of technology absorption capability</td>
</tr>
<tr>
<td>• Internal market dynamics</td>
<td>• Limited entrepreneurial education and deep technology</td>
</tr>
<tr>
<td>• Physical infrastructure</td>
<td>• Limited technology talent and developers</td>
</tr>
<tr>
<td>• Startup opportunity</td>
<td>• No focus on high-growth startups</td>
</tr>
<tr>
<td>• Economic stability</td>
<td>• Lack of idea- and seed-stage funding</td>
</tr>
<tr>
<td>• Geographic location</td>
<td>• Risk capacity</td>
</tr>
</tbody>
</table>

Sources: Global Entrepreneurship Monitor and GEDI (2020).
Four Sectors

The four sectors of cleantech, edtech, agritech, and healthtech not only contribute to economic growth, but also support broader development goals. Edtech and healthtech support human capital development and personal welfare. Agritech can help increase the productivity of farmers, who are among the poorest in society. And cleantech or greentech offers solutions to improve environmental sustainability and mitigate climate change. These four sectors, along with inclusive fintech, are the focus of the Asian Development Bank’s support for tech startups.

3.1 Cleantech

Cleantech refers to “any product, service, or process that delivers value using limited or zero nonrenewable resources or creates significantly less waste than conventional offerings” (Pernick and Wilder 2007, 2). Each year, an average of 52 cleantech startups are founded worldwide, a very small number compared with e-commerce (Mytton 2019). Cleantech has existed in Thailand for several years, including the use of solar cells and the generation of other forms of renewable energy, such as from biomass. However, there are still very few cleantech startups, in part because they are difficult to start, need considerable research and development (R&D) funding, and require deep technology.

Thailand scores below the global average on cleantech innovation drivers, emerging innovation, and commercialized innovation, according to the Global Cleantech Innovation Index (UNIDO et al. 2017). Strength factors include strong early-stage entrepreneurial activity, tax benefits for startups, and a strong academic research culture. Weaknesses, according to the index report, include institutional and regulatory issues, few programs specifically targeted at cleantech startups, low public R&D expenditure in cleantech, and a disconnect between academia and industry needs.

---

4 This is the most recent index from this source.
To develop the ecosystem for cleantech startups in Thailand, more attention from various stakeholders is needed. The government and corporations can provide more incentives to create a supportive ecosystem, but it is also necessary for more entrepreneurs to come forward, especially those who have innovative cleantech technologies, can anticipate opportunities, and are able to turn their ideas into new business ventures.

3.2 Edtech

Edtech is the use of digital technology such as computer software applications, online platforms, and artificial intelligence to improve learning outcomes. Interactive digital platforms can create an enhanced learning experience. Edtech is increasingly being adopted by school systems, schools, and teachers in many countries. A survey in the United States found that 86% of teachers believe the use of edtech is important, 96% feel it increases student engagement in learning, and 89% think it improves student learning outcomes (Bates 2016). The edtech market has grown rapidly since 2020 due to school closures and the shift to online learning as a result of the pandemic.

There is much discussion in Thailand about reforming the education system. The Ministry of Education has the largest budget in the government, but learning outcomes remain modest, and there are significant inequalities, with a widening gap between urban and rural areas. These problems can be an opportunity for edtech startups. Nevertheless, investors consider edtech less attractive than e-commerce and fintech because it takes time to change education practices to include edtech.

Nonetheless, Thai universities have adopted online learning through hybrid systems that combine face-to-face instruction and e-learning, and students are accepting the comprehensive paradigm shift in learning. Massive open online courses are also widely used in Thai society. However, these courses usually provide e-certificates for participants, which is not attractive to many Thai parents and students. They still believe that a degree from a well-known university, whether at home or abroad, offers better chances of getting a job in a big company.

Much of the market is controlled by the Ministry of Education and individual schools, so edtech startups may face a long process of public decision-making, as well as regulations and established curricula, before their innovations are approved for use.

In summary, the edtech startup community in Thailand is not yet mature and needs to be catalyzed by various stakeholders. Some public and private educational institutions have embraced edtech, which provides opportunities for startups. Venture capital (VC) and entrepreneurs are needed in this sector to spur growth.
3.3 Agritech

Agritech refers to solutions to improve efficiency in farming or fishing practices and includes the use of artificial intelligence, data systems, drones, the Internet of Things, and others. Agritech is applied upstream, while foodtech is applied downstream in the food supply chain, so the two areas are closely linked.

Globally, agritech is an important startup sector for investors, receiving a high volume of funding. There are several reasons for this high level of investment. First, the world’s population is expected to reach 8.5 billion by 2030, so innovative and efficient methods of growing food are needed. Second, arable land is shrinking by more than 100,000 hectares per year due to climate change and urbanization (Dutia 2014). Finally, greenhouse gas emissions are increasing, and 21% of these come from agriculture and forestry, making them together the second-largest emitter after the energy sector. Public and private stakeholders therefore agree that the situation needs to change and that agritech (in combination with greentech) can be part of the solution.

Thailand has abundant arable land suitable for agriculture. At the same time, many Thai farmers are poor and operate with low productivity while facing the challenges of climate change and price volatility for their crops. For several decades, the government has neglected to promote technological advances in agriculture. However, the Agriculture 4.0 program, which is part of the government’s Thailand 4.0 strategy, focuses on technological development in agriculture.

Although agritech startups could offer new practices to Thai farmers, individual farmers may not adopt new technologies because of their cost. To solve this problem, farmers could collaborate to work on a larger scale. However, in doing so, they may face limitations due to differences in crops and farms. For this reason, agritech startups are more likely to partner with large companies (i.e., agribusinesses) that have the financial resources and economies of scale to benefit from agritech investment. In addition, the willingness of Thai farmers to adopt new technologies is a critical factor in agritech’s growth. However, most farmers are not technologically advanced and are unable or unwilling to adopt the innovations offered by startups. Farmers’ digital literacy and transformation skills remain weak. This is especially true for the older generation of farmers, whose acceptance and ability to use such technologies is low.

The agritech community has grown and public and private stakeholders are driving the ecosystem to the next level. Startups will likely continue to grow as Thailand has strong country-specific advantages in agriculture.
3.4 Healthtech

Healthtech, sometimes referred to as “digital health” and including medtech, uses mobile devices, digital apps, wearables, and other devices to improve access, diagnostics, and management in the health sector. Before the pandemic, healthtech was growing rapidly worldwide and has received a big shot in the arm due to the pandemic. A major challenge is privacy regulations that restrict the sharing of personal data.

Thai society is aging, and the demand for health services is increasing. The growth of medical tourism has also expanded the market. Accordingly, opportunities in the healthtech sector are promising. The Health Tech Startup Thailand Association was launched in 2018 with 55 members. Stakeholders in the sector include government agencies, hospitals, universities, large corporations, and startups themselves. These startups can be categorized by different service types: search for services, telehealth, clinic or pharmacy management systems, remote monitoring, doctors’ network, and personal health and fitness.

Still, there are several risks for healthtech startups. First, some laws and regulations are not aligned with technological advances and other disruptions in the market. Second, technological adoption in an aging society may not be high due to the limited learning capacity of seniors, especially in rural areas, even if digital infrastructure has spread to these areas. Finally, investors want to see doctors or other health-care professionals on the startup team, but these professionals are in short supply. There are only two medical professionals for every 1,000 residents in public institutions. This makes it difficult for healthtech startups to attract medical professionals to their companies (Witthayapipopsakul et al. 2019).

In summary, the ecosystem for healthtech startups is still at an early stage of development, compared with the global healthtech situation. The opportunities in the health-care sector are promising given the aging population and the shortage of health-care professionals. The network of healthtech startups is closely intertwined, and the various players support each other in building the ecosystem.
The key elements of an ecosystem are financial access, government policies, human capital, digital infrastructure, and incubators and accelerators. These elements generally work well in Thailand and support startups. Other elements are weaker, including suppliers, customers, culture (including role models and mentors), and traditional infrastructure such as transportation and energy. All aspects of the ecosystem were discussed in interviews with young Thai startups (less than 5 years old) operating in cleantech, edtech, agritech, or healthtech. Other experts and ecosystem players were also interviewed.

Since each startup has a different business model and offers different products and services, the importance of each ecosystem factor is not the same for all startups. For example, a cleantech startup that generates alternative energy by converting heat from air conditioners into hot water does not rely heavily on digital infrastructure. However, an edtech startup that runs a platform for teachers, students, and parents to obtain information about school registration and learning materials does rely on infrastructure.

4.1 Finance and Investment

Finance is a critical factor for any tech startup because it enables the purchase of facilities and equipment and hiring of employees. Companies go through various stages of development, from defining an opportunity to R&D, startup, early growth, scale-up, and rapid growth. Finance is needed at each of these critical stages. Bootstrapping (personal finance) can be used in the early stages, but formal financing sources are needed for expansion and scale-up. In addition, companies in the startup stage typically do not yet reach breakeven or generate positive cash flow because sales have just begun. As a result, most startups do not want bank loans because they need to be serviced with regular payments. They seek equity investment.

Even though the term “startup” has only been used widely since 2016, venture capital (VC) has been investing in startups for many years. The Thai Venture Capital Association was founded in 1994. In 2015, there were already 23 VC funds that...
invested in startups that year (Figure 4). Many commercial banks have established business units that invest in tech startups such as Beacon Venture Capital at Kasikorn Bank, Finnovate at Krung-Sri Bank, and Digital Ventures at Siam Commercial Bank. Table 2 illustrates the Thai VC and investment landscape.

Table 2: Thai Investors and Investment Landscape

<table>
<thead>
<tr>
<th>Corporate Venture Capital</th>
<th>Traditional Funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add Ventures by SCG</td>
<td>Nvest Venture</td>
</tr>
<tr>
<td>Ananda Urban Tech</td>
<td>Expara</td>
</tr>
<tr>
<td>Bangchak</td>
<td>Siam Commercial Bank</td>
</tr>
<tr>
<td>Beacon Venture Capital</td>
<td></td>
</tr>
<tr>
<td>Bualuang Ventures</td>
<td></td>
</tr>
<tr>
<td>Digital Ventures</td>
<td></td>
</tr>
<tr>
<td>ExpresSo</td>
<td></td>
</tr>
<tr>
<td>Fuschia</td>
<td></td>
</tr>
<tr>
<td>Intouch InVent</td>
<td></td>
</tr>
<tr>
<td>Krung-Sri Finnovate</td>
<td></td>
</tr>
<tr>
<td>Singha Ventures</td>
<td></td>
</tr>
<tr>
<td>Siri Ventures</td>
<td></td>
</tr>
<tr>
<td>Thaioil</td>
<td></td>
</tr>
<tr>
<td>True Incube</td>
<td></td>
</tr>
</tbody>
</table>

Note: Thailand’s startup investment landscape is dominated by CVC. Source: TVCA (2018).
Many corporations have also entered the startup landscape by establishing corporate venture capital (CVC) funds. These include Siri Ventures from Sansiri, Ananda Urban Tech from Ananda Development, and AddVentures from Siam Cement Group. Other corporations invest directly in startups without operating a dedicated fund. The number of CVC and corporate investors making investments in 2021 totaled 45, compared with 43 stand-alone VC funds (Table 2). The objective of CVC is usually strategic—i.e., they invest in startups that can help the company and potentially be bought by it. Startups in Thailand are not typically funded until the Series A stage, and CVC does not typically invest in high-risk startups, including those at the idea or seed-funding stage. Accordingly, tech startups at these stages have difficulty raising funds.

Furthermore, available funds often exceed the viable investment opportunities. For example, from 2011 to 2017, the total funds available to startups were about five times the amount invested. According to a 2018 survey by the Thai Venture Capital Association, investors face limited investment opportunities because not enough promising startups come forward seeking funds. Investors focus their investments on three evaluation criteria: (i) a highly qualified founder or startup team, (ii) a viable strategy and business model, and (iii) adequate market size and opportunity. Startups that do not meet these criteria will not receive funding. Several of the startups interviewed acknowledged that limited funding was available from VC funds, including CVC.

Half of the investors surveyed indicated that a startup’s revenue generation is not a prerequisite for investment. Moreover, almost all investors intended to invest more in startups in the next 3 years. However, two-thirds of them planned to invest outside of Thailand. Although e-commerce and fintech have been the dominant sectors for startup investment, agritech, artificial intelligence, and big data have emerged as intriguing sectors for investors.

The government has promoted startup financing through various projects and activities. For instance, startup vouchers provide funding for startups’ sales and marketing activities. Other government agencies support pitch competitions that offer prize money. Tech startups that have not yet raised funds from investors participate in these competitions for the chance to access finance and, also, to advertise their startup as a trigger to secure a first meeting with investors.

Each of the four types of startups that are the focus of this report faces different financial constraints and opportunities.

Cleantech startups are quite rare in Thailand and therefore investment in this sector is not significant. PTT ExpresSo is one of the few CVCs investing directly in these startups. However, CVCs that have emerged from the real estate industry,
such as Ananda Development and Sansiri, are interested in investing in solar and other renewable energy solutions. Cleantech startups usually create physical products (infrastructure) with or without a connection to digital platforms. Due to the need to create and install physical infrastructure, the ability to scale up is slower than for app-based services or digital platforms. Moreover, the value of investments in cleantech startups is higher due to infrastructure and installation costs, and the payback period is longer than for digital-based enterprises. As such, angel investors and VC firms are less interested in this sector. Accordingly, most cleantech startups in Thailand raise their funds through bootstrapping and from research and prototyping funding from the government.

Investor interest in edtech is limited, but it is becoming more attractive. The valuation of such businesses is not high compared with fintech and e-commerce. As such, edtech startups are not attractive to many investors. StormBreaker Venture in Thailand is the first dedicated edtech accelerator in the region and also provides investment financing. However, it focuses on providing corporate social responsibility funding to startups that develop free educational solutions, rather than supporting startups that will generate profit.

Agritech startups often emerge from the research lab and therefore typically gain access to research funds from government agencies and universities. Bootstrapping is also common. However, angel investors and VC firms are showing increasing interest in these startups (more so than for edtech, cleantech, or healthtech). Space-F is a food accelerator established by Thai Union Food, with the latter providing CVC funding. Also, international angel investors and VC firms sometimes seem more interested in agritech in Thailand than domestic angels or VC firms.

In the health-care sector, it is difficult to link business value to welfare or social benefit. One interviewee said that some healthtech startups care more about social impact than profit. Also, more than 80% of health care is provided by the government as public services. Therefore, investors are reluctant to invest capital in healthtech startups. Many healthtech startups are funded through bootstrapping and research funds, especially by founders who are doctors. Real estate CVCs are interested in healthtech because it can provide smart living solutions for their properties.

Siri Ventures set up a venture fund in 2018 to invest B1.5 billion in healthtech, prop tech, and livingtech startups. The cofounder of 500 TukTuks pointed out that healthtech is the least active sector in seeking funds. Financiers are willing to invest in the sector, but not enough healthtech startups are coming forward.

In cleantech, Thai corporations in the energy sector have begun to catalyze the startup ecosystem by initiating accelerators and incubators, investing in startups working on electric vehicles, establishing CVCs, and collaborating
on R&D. For example, PTT ExpresSo has partnered with Elemental Excelerator, an accelerator focused on cleantech. One of the main reasons for this is to gain access to cleantech startups that provide investment and collaboration opportunities for PTT. In addition, PTT ExpresSo manages a B1.6 million fund to finance new business solutions.

4.2 Government Policies, Programs, and Regulations

Since 2016, the Thai government has provided active support to fostering a robust startup ecosystem. The National Startup Committee (NSC) was formed with representatives from the government and private enterprises with a mandate to plan an agenda for startup development. Working groups were established on awareness and communication, infrastructure, incubation, and policy recommendations. In addition, the NSC drafted and held discussions on the Startup Act, which would provide a regulatory framework for stakeholders in the ecosystem. The act could change the face of research and innovation in Thailand as it will help researchers commercialize their innovations.

Other regulations, such as the SMART visa for foreign tech talent, a 5-year income tax exemption, and tax incentives for angel investors, took effect in 2018. The Bank of Thailand has also launched a regulatory sandbox for the fintech industry to experiment with new regulations.

As mentioned earlier, the government’s Startup Thailand 2016 was an important event to create awareness and support networking in Thai society. Various government agencies have initiated incubation and acceleration programs, such as the Digital Economy Promotion Agency (DEPA) Accelerator Program and the Startup Thailand League. The government has also allocated funds to support coworking spaces at public universities and on other government properties. In addition, research grants and competition prizes are available as a source of capital for the pre-seed stage. These government programs have advantages and disadvantages, as noted by Sukpanich and Juasrikul (2019) and summarized in Table 3.

Some earlier regulations were impractical. For example, the tax incentive for angel investors, since discontinued, provided a personal income tax deduction for investments in startups up to B100,000. However, this scheme was not very attractive because the ceiling was low. Furthermore, the benefits of other current regulations...

---

5 Elemental Excelerator.
6 ExpresSo (in Thai).
7 As of early 2022, the draft act has not been enacted into law.
tax regulations may be limited. For example, startups are exempt from corporate income tax for the first 5 years of operation, but most startups do not generate profit during these years.

Further, some laws and regulations are restrictive, and others do not encourage foreign startups or investors to come to Thailand. First, startups are not allowed to issue convertible loans. Second, there are no regulations on stock vesting, which would allow founders to distribute their stock over time. Third, regulations do not allow firms to set up employee stock option programs that could support startups to recruit and retain talented human resources. Fourth, startups registered in Thailand must pay an investment tax when they receive an investment. Finally, all legal documents in Thailand are written in Thai, which must be translated into English for foreign investors.

More specific government regulations and support target specific sectors. Here we consider those that relate to the four sectors of this study.

In the cleantech sector, the Ministry of Energy has launched two major plans: the Power Development Plan 2016–2036 provides investment policies that prioritize energy-saving technologies and renewable sources such as biomass, biogas,
solar, and wind energy. In addition, the Alternative Energy Development Plan 2016–2036 encourages substitutes for natural gas power generation, focusing on these alternatives. The plans may provide opportunities for cleantech startups, although they have not benefited much from the policy in the early years.

The National Science and Technology Development Agency (NSTDA) supports cleantech startups by providing R&D grants as well as matching researchers with startups to solve specific technology problems. NSTDA is also a partner in the Cleantech Program for SMEs of the Global Environment Facility and the United Nations Industrial Development Organization. This program promotes cleantech innovations in support of energy and water efficiency, waste beneficiation, renewable energy, green buildings, and green transportation. The program provides incubation and mentoring support from experts in subfields of clean energy and organizes a pitching competition. The Ministry of Energy has partnered with Kasetsart University and Burapha University to conduct research on algae biofuels (Wang 2011).

Startups listed by the National Innovation Agency (NIA) as innovative firms benefit from government procurement. Startups are also frequently called upon to provide services for environmental requirements that other companies must meet. For example, wastewater must be treated before discharge, and the government provides a list of approved companies that offer water treatment services. The startups on this list benefit from the demand for their services.

In edtech, startups do not face specific regulatory barriers, although they must negotiate government approval and procurement systems to supply public schools. Of greater concern is the perception that edtech provides “nice-to-have” rather than “must-have” services and that the government does not have a strong need for new solutions. Accordingly, there is little specific policy support for edtech.

The Ministry of Education invested in edtech by initiating the One Tablet PC per Child project in 2012. Primary school students were provided with a tablet containing educational content, which was especially useful for those in remote areas without internet access. Although the project had a valuable goal, a one-way teaching method was used to deliver the content, and the learning quickly became outdated and was discontinued.

In agritech, Agriculture 4.0, as part of the government’s Thailand 4.0 strategy, focuses on technological development to improve agricultural production, especially with precision agriculture, robotics, and biotechnology. The Ministry of

---

8 The Global Cleantech Innovation Programme for SMEs in Thailand (in Thai). The other partners are the Office of National Higher Education Science Research and Innovation Policy Council, Department of Industrial Promotion, Kasetsart University, the Federation of Thai Industries, and the Thai Chamber of Commerce.
Agriculture and Cooperatives supports the sector, and there is cross-collaboration on smart farming between this ministry and the Ministry of Digital Economy and Society (MDES), the Ministry of Education, and Total Access Communication (DTAC), a private corporation.

Since 2015, new public centers and research facilities for agriculture technology have been established. NIA set up the Agro Business Creative Center to ignite innovation in the sector, and NSTDA established the Agricultural Technology and Innovation Management Institute to accelerate technology transfer to farmers, support farmer learning, and incentivize innovation. Given the linkage between agritech and foodtech, Food Innopolis, a center for food research and development and innovation hub has hosted activities for foodtech startups, including a training bootcamp, demo days, and hackathons. It also provides coworking space and connects research personnel with food businesses.

A major problem for startups is the newness of products and services, which means that they are not listed under current laws and regulations. In particular, the product registration and standards process cannot handle new agritech solutions because there are no product categories. As a result, some startups cannot bring new products to market on a large scale. For example, one startup developed plant vaccines, but the product was not listed in current regulations, so government officers had difficulty approving the product for public sale.

In healthtech, startups can receive research grants and benefit from government contracts if they offer needed innovations. NIA has established the Yothi Medical District as a platform for R&D and collaboration among health-care stakeholders. The market for healthtech depends in part on whether the new product or service is covered by health-care reimbursement plans (insurance), such as the gold card scheme that most Thais have. There is a large market for products covered by insurance, and it is the government that determines which products are covered.

Healthtech solutions related to medical devices and pharmaceutical products still face difficulties in testing and meeting product standards due to a lack of expertise in this area and the newness of the solutions. In addition, some regulations could be reviewed. For example, doctors cannot make diagnoses via videoconferencing or other digital platforms, only consultations and suggestions. However, some diagnoses do not require a doctor to touch or meet with a patient.

9 Food Innopolis. 10 Thai TeleHealth (in Thai). 11 The gold card scheme or 30-baht scheme is a universal health-care insurance scheme requiring a flat user fee of B30 be paid per consultation or offered free for those who fall under the exemption categories.
4.3 Digital Infrastructure

Digital infrastructure is an important element of the startup ecosystem because it enables startups to offer services by connecting with customers. In general, the startups interviewed did not cite the lack or weaknesses of digital infrastructure in Thailand as a problem. This may be because startups emerged after the infrastructure was developed and most of them do not need very fast high-tech infrastructure to offer their solutions. In many cases, the main obstacle is not the state of the technology but customer access, the cost to them, and their willingness to pay for services. These are problems especially for rural consumers of agritech, healthtech, and edtech, where customers are households, farms, and institutions such as hospitals and schools.

The government has created the National Digital Economy Masterplan, which has four phases: laying the digital foundation, achieving digital inclusion, moving to full transformation, and achieving global digital leadership. Many digital-related regulations and laws have been approved or are under consideration, including the Data Protection Law and laws on e-transactions and cybersecurity. Thailand has invested heavily in its digital infrastructure, including an expansion of services in rural areas. For example, in 2018, the MDES launched a nationwide village broadband network called Connected Netpracharat, to provide affordable high-speed internet to poor households in more than 24,000 villages. However, the lack of good access in rural areas remains a problem.

In addition, Digital Park Thailand was established in the Eastern Economic Corridor, the country’s main manufacturing and service zone southeast of the capital. The park supports digital and economic development, including facilitating access to the submarine cable system, with a cable landing station and data center aligned with Thailand 4.0.

The four types of tech startups examined in this report face different constraints and have different digital infrastructure needs.

In cleantech, digital infrastructure is not a major constraint for many startups, especially those that route their digital data streams over local area networks in factories and other buildings. However, startups that use the Internet of Things (IoT), big data, and blockchain to track and deliver their products and services rely on fast and efficient infrastructure. For example, PAC, a company that converts heat from air conditioners and sends it to water heaters, is using IoT to track the energy consumption of various air conditioners and monitor power usage at large hotels and resorts. Hybrid Aerator, which has developed an innovative wastewater treatment process, uses a digital data platform on the internet to track and
control the operation of its aerators at multiple sites. The weaknesses of digital infrastructure in rural areas limit the market for this and other startups seeking to reach rural customers.

In edtech, online learning services require a reliable digital infrastructure. Edtech startup solutions can be classified into five domains: (i) online learning in educational institutions, (ii) online learning at home, (iii) reskilling and upskilling in corporations, (iv) finding teachers and programs, and (v) using cloud services to manage schools and institutions. All four domains require digital services. Limited access to quality digital infrastructure in rural areas reduces the customer base for edtech startups.

In agritech, some startup innovations involve deep technologies such as biochemical engineering and nanotechnology. The use of their products and services may not be directly affected by the quality of the digital infrastructure. However, other solutions require the use of big data, IoT, and blockchain, for which good digital infrastructure is essential. The low digital literacy of farmers limits their ability to adopt the innovations offered by startups.

In healthtech, many solutions require good digital infrastructure and platforms. The lack of adequate digital infrastructure in rural areas limits access of rural hospitals, clinics, and households to healthtech solutions. There is also a gap in digital literacy, not only between regions, but also between generations. Healthtech startups that manufacture medical devices are not as affected by infrastructure as those that offer platform-based solutions.

### 4.4 Human Capital

Highly skilled workers are an important part of the ecosystem. Startups need tech expertise, and since many startups are platform-based, the demand for computer programmers, developers, and coders is high. Moreover, deeptech startups need top scientists, engineers, and product designers to develop commercialized prototypes. Talented managers who drive innovation on the business side are also needed. People with good English skills are in demand, especially for startups expanding into foreign markets.

Thailand has a relatively high number of tertiary education graduates, many of whom are trained in technology-related subjects. In 2019, universities produced 34,700 graduates in information and communication technology, natural sciences, mathematics, and statistics. However, many of these graduates seek employment in large companies because they offer stable employment and good benefits.
As a result, the supply of technical and business talent for startups is limited. Since 2016, the startup community has raised the issue of human capital with the government.

When sufficient domestic talent is not available, startups can recruit workers from abroad. This practice has been encouraged by the government’s introduction of the SMART Visa, which allows foreign experts and leaders in science and technology, as well as investors and startups themselves, to come to Thailand.

For the four types of tech startups covered in this report, the human capital issues and constraints can be summarized as follows:

In cleantech, the main products are machines, so engineers and product designers are needed to commercialize ideas. Many founders are former researchers or come from technical fields. They need partners or managers with talent from the business world, especially marketing and finance, to develop a viable business model.

In edtech, many startups offer their services digitally and therefore need programmers and developers. Trained marketing and sales personnel are also important. Indeed, sales personnel need to be knowledgeable about both marketing and digital platforms in order to sell the startups’ services. However, people with such hybrid skills are hard to find. Some edtech startups recruit skilled staff from abroad, including India, but need to offer salary and incentives to attract such foreigners.

Agritech startups need scientists from different subdisciplines. Here, too, there is a shortage. One of the strategic actions of agritech startups is to access expertise from research institutes and universities. However, a startup founder must have the right connections to gain this access. Some startups rent office space in Science Park Thailand to connect with researchers working in similar fields.

In healthtech, doctors, nurses, and pharmacologists are among those needed. Many startup founders do not have medical training and therefore hire medical and health professionals as consultants to provide technological knowledge. Some healthtech startups in the medical device industry have difficulty finding product engineers and designers.
4.5 Incubators and Accelerators

Before the startup era, small and medium-sized enterprises (SMEs) were supported by Thai government agencies, which sometimes referred to their business training programs as “incubators.” In recent years, the number of startup incubators sponsored by both the public and private sectors has increased significantly, and accelerators have been added to the startup scene. Incubator programs are designed for early-stage startups and provide help in working out an idea, creating a business model, and developing a product. Accelerators support startups that are already established, have a minimum viable product, and are ready to scale up. Some programs offer a demo day at the end of the program, where a startup can demonstrate its product or service and seek funding from investors in attendance.

Government agencies, corporations, financial institutions, and universities offer incubator and accelerator programs in Thailand. These programs are an important part of the ecosystem, but currently offer more places than there are startups wishing to join. Some programs specialize in specific sectors, such as Space-F for foodtech and StormBreaker Venture for edtech. In Thailand, as elsewhere, access to knowledge may not be the primary or only reason for participating in a program. The opportunity to pitch to venture capital investors, connect with the program’s business network, or find a good mentor are also important factors.

Table 4 shows the main incubators and accelerators in Thailand. Programs established by financial institutions, such as Bangkok Bank InnoHub and Krungsri Rise, focus on fintech. In contrast, programs launched by telecommunication companies, such as AIS Startup and DTAC Accelerate, are more open to a broader range of sectors. The government operates three accelerators: DEPA Accelerator Program, Food Innopolis, and Spark. The Innovation Driven Entrepreneur accelerator, run by the University of the Thai Chamber of Commerce, focuses on fostering an entrepreneurial mindset. Several startups have participated in this program and used it as a springboard to participate in other accelerators.

In cleantech, there is one dedicated incubator, the Cleantech Program for SMEs in Thailand, as mentioned earlier. It trains both cleantech startups and other SMEs. With the limited number of cleantech startups in the country, people with sector expertise who can give advice or act as mentors are rare. Some cleantech startups have joined Innovation Driven Entrepreneur and Sprint, which are deeptech accelerators.
StormBreaker Venture is the only dedicated edtech accelerator in Thailand and the first of its kind in Southeast Asia. It also provides seed funding. However, it mainly invests in and promotes startups that focus on social rather than economic benefits. Several edtech startups under this accelerator have focused on how to provide better education for all, rather than offering platforms that manage educational systems and improve teaching in schools. As edtech startups provide platform-based solutions, some join incubators and accelerators run by telecommunication companies.

Agritech and foodtech are related, and accelerators focused on food, such as Food Innopolis and Space-F, play a critical role in this sector. These accelerators are typically run by food companies or government agencies, so they provide good opportunities for startups to expand their connections. Startups also participate in programs to find researchers and experts. Most agritech startups offer business-to-business and technology-driven solutions that benefit food companies. Therefore, joining an accelerator is a way to gain the attention of corporations that could use the startup’s products and services.

Food corporations are not only buying up promising agritech startups, but also nurturing the industry’s ecosystem. Minor International, for example, launched the Minor Tasting the Future Hackathon to promote foodtech startups. Suranaree University of Technology held SUT Hackathon 4: From Farm to Factory to explore new solutions for agritech.

In Thailand, there are few dedicated incubator or accelerator programs in healthtech. In 2017, Bayer Corporation launched an accelerator to promote health innovations for an aging society. The Healthtech Association in Thailand organizes meetings to informally exchange knowledge and advice among startups. Some healthtech startups, especially those offering platform- or software-based services,
participate in general accelerator programs. Sprint Accelerator, for example, helps healthtech startups with technology solutions. However, there are very few healthtech startups that have developed new medical devices or equipment for surgery. The Yothi Medical Innovation District conducts short training programs for the industry. Linkages between healthtech and insuretech are embedded in the startup ecosystem. Alliaze Ayudhaya Activator, for example, is an incubation program that supports collaboration between insurance, finance, and health-care technology. Furthermore, the National Innovation Agency (NIA) has partnered with Mahidol University to launch the 2019 Global HealthTech Hackathon Challenge. This pitching event is designed to encourage young medical engineers to develop health-care solutions that can lead to the creation of a startup.

4.6 Other Ecosystem Factors

Other elements of the ecosystem can support or constrain the development of startups. These elements include suppliers, customers (i.e., market demand), startup culture, role models and mentors, and non-digital infrastructure (e.g., transportation and energy). The importance of these elements can vary widely by sector.

Cleantech is influenced by several of these other factors. Because many products are hardware (i.e., equipment), high-quality Thai engineering and design expertise is required and is not always available. Customer demand for cleantech is also critical. Many cleantech solutions offer long-term benefits but require large up-front investments. Some cleantech solutions are only accessible to customers with adequate liquidity. The lack of non-digital infrastructure can actually increase demand for cleantech solutions. For example, solar panels are needed by those who do not have access to traditional power sources. Because cleantech startup development is still young, mentors and role models are scarce.

In edtech, customers are primarily schools and other educational institutions that follow a purchasing cycle based on semesters or an annual budget. Startups must invest time and effort to build a relationship with their customers. In addition, there is a generational shift taking place in the teaching profession. More than 30% of teachers are expected to retire by the mid-2020s, which could be an opportunity for startups. Teachers of the new generation are more likely to adopt digital pedagogy than those retiring. Public school budgets may be too low to fund the adoption of edtech innovations. Therefore, an important customer for startups are urban private schools.
Agritech faces several constraints in terms of customer demand. First, some solutions are costly for farmers, and at the same time, they find it difficult to understand the technology and appreciate its benefits. If they cannot see the benefits, they will be reluctant to pay for the solution. Second, solutions can only be profitable for large farms, but most farmers have only a small piece of land. Therefore, agritech startups tend to focus on large agri-food companies rather than individual farmers. And third, many in the agricultural industry value technologies, fertilizers, and chemicals from abroad—they have less confidence in inputs produced in Thailand. In addition, mentors and role models are hard to find in the agritech sector.

The market demand for healthtech products and services is not well developed. Most Thais believe that the government should pay for health care. In addition, customers believe that products from developed countries are of higher quality than those from Thailand, even if the device offers the same functions. Many Thais do not take precautions to prevent illness, but seek help only when they are sick. These circumstances make it difficult for healthtech startups to generate a market, especially those offering software-based health-care services.

In addition, startups that offer medical devices and related hardware face an environment where there are few suppliers to manufacture their products. Many of these startups are led by physicians who have the knowledge and ability to develop an initial prototype but do not know how to organize and manage the production of the final, commercially viable, product.

In some areas, the government has become a competitor, observing the products and services of healthtech startups and then offering them itself. This is happening in part because the government is under pressure to provide new services as public goods. Even though some startups benefit from government procurement programs, the interaction between startups and government agencies is still very uncertain. And because the healthtech sector has only emerged in recent years, role models and mentors are scarce.
Thailand’s startup ecosystem has developed rapidly since the early 2010s. Its development has been catalyzed by many stakeholders, including the government, which believes that startups will represent a new engine of growth that can move the economy out of the middle-income trap. Society is very aware of the importance of startups, although there is still some confusion about how they differ from SMEs.

The number of startups and investments in startups has increased substantially in the past 7 years, but the trend may be leveling off for several reasons. First, the number of people with technology expertise (i.e., tech talent) is limited, making it difficult to attract the skilled workers needed to launch new startups. Tech startups still face challenges in finding the human capital they need. Second, it has taken a long time to develop rules and regulations such as the draft Startup Act, which creates uncertainty in the ecosystem. The tax administration still does not support Thai startups, especially in e-commerce or other platforms. And third, tech startups need founders who have both entrepreneurial mindset and technical knowledge, and there are few of them. Many tech experts do not begin the startup journey because of the uncertainty.

Startups in agritech, edtech, cleantech, and healthtech need support from the government, but also from universities, large corporations, financial institutions, and other stakeholders. Opportunities for improving the ecosystem remain. For example, spinout programs from universities and research institutions are needed to encourage professors and researchers to start tech startups. Such programs could exploit domestic technologies that have been developed and tested but not yet commercialized.

In summary, the tech startup community in Thailand is growing. Most startups are engaged in fintech and e-commerce, but startups in agritech, cleantech, healthtech, and edtech have also emerged. The government and other stakeholders can continue to collaborate and catalyze the development of the ecosystem to support these sectors.


Thailand’s Evolving Ecosystem Support for Technology Startups

Technology-based startup enterprises are an increasingly important part of the business landscape in Asia and the Pacific. By applying innovative technologies to create new products and services, they can make a significant contribution to economic development while generating social and environmental benefits. However, to survive and then thrive, tech startups require an enabling ecosystem that includes supportive government policy, adequate access to capital, skilled personnel, and quality digital infrastructure. This report assesses the current ecosystem for tech startups in Thailand, focusing on four sectors: climate change, education, agriculture, and health. The report discusses challenges facing tech startups in these sectors and provides recommendations.

About the Asian Development Bank

ADB is committed to achieving a prosperous, inclusive, resilient, and sustainable Asia and the Pacific, while sustaining its efforts to eradicate extreme poverty. Established in 1966, it is owned by 68 members—49 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.