

Enabling Environment of the Water-Energy-Food Nexus

COUNTRY PROFILE -THAILAND



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1 SUMMARY

1.1 Country Context for the Water-Energy-Food Nexus

The agricultural sector in Thailand has a significant role in catering to the global demand for both basic and processed agricultural products. However, Thai farming is considered small-scale (on average four hectares per household), since most farms are owned and operated by family members and inherited from one generation to the next. This resonates with the fact that Thailand's agricultural sector accounts for around 10% of the nation's GDP and constitutes around 30% of the total labor force, covering 6.4 million households and 20.4 million hectares of farmland. Throughout the country, only 23.9 million hectares are arable land (68% for field crops, 23% for perennial trees), due to the limitation of irrigation.

As of 2019, the share of labor in agriculture between men and women is 61% and 39% respectively.¹ Nevertheless, according to the 2017 farmer registration, some 40% of farm households do not have land ownership; and only 42% of them have access to water resources, creating a large inequality in access to land and water resources.² Despite Thailand's formal legal framework supporting the rights of women to own land individually and jointly control marital property, men – particularly in rural areas – customarily control most of the productive assets, including agricultural land.³

Thailand has abundant natural resources, a skilled workforce, relatively cheap labor, and a year-round growing season. Almost 50% of the energy consumed in Thailand is from imported sources; 33% from natural gas and coal, and 18% from traditional and other renewable energy. The agriculture sector consumes 3.4%⁴ of the total electricity consumed in the nation, whereas the sector (agriculture waste, and biogases) contributes 40% of the electricity produced by renewable energy.⁵ Thailand consumes 75% of its fresh water for agricultural activities. The yearly freshwater requirement of the country is about 152 billion m³, with 114 billion m³ for agriculture, 11 billion m³ for industry and domestic consumption, and 27 billion m³ for maintaining the ecosystem.⁶

1.2 Priorities and Resources for Innovators in the Water-Energy-Food Nexus

Thailand's ranking in the World Bank Group's 2020 Ease of Doing Business Report was 21st out of 190 countries, and in the 2018 Global Competitive Index 4.0, ranked 38th out of 140 countries. The Thailand Board of Investment (BOI), an agency of the Government of Thailand, established the One Start One Stop Investment Center (OSOS) which provides comprehensive information and assistance to facilitate investors who wish to start or expand businesses, as well as invest in Thailand. Rice is a key food crop in Thailand. It involves 3.55 million households of rice farmers, accounts for almost 40% of the total agriculture area and consumes the largest volume of water in Thailand, compared to other crops and sectors.⁷

See Annex 1 for summary analysis of enabling environment policies/plans.

See Annex 2 for local enabling environment actors and stakeholders in the WEF Nexus.

See Annex 3 for emerging players in MSME support landscape in the Annex 3.

See Annex 4 for a tax profile of Thailand.

See Annex 5 for key demographic indicators of Thailand.

See Annex 6 for a map of major crops by region.

2 MACRO-LEVEL: POLICIES AND TRENDS IN THE WATER-ENERGY FOOD NEXUS

2.1 Economic Growth and Agriculture

- Thailand's economy is expected to grow 4% in 2021, following a 6.5% decline in 2020. Exports and private investment are estimated to have declined by 18.5% and 4.4% respectively, while household consumption declined by 1.3 %.⁸
- Thailand has traditionally been an agrarian-based country, with rice as the top economic crop.⁹ Other crops grown include rubber, sugarcane, cassava, fruit, cashew nuts, corn, tobacco, cotton, cocoa, peanuts, soybeans, medicinal plants, dairy, and fishery products.
- The agriculture sector accounts for 10% of the nation's GDP and employs around 30% of the total labor force covering 6.4 million households.¹⁰
- Two third of households still grow one crop a year, especially for the key economic crops. Although irrigation systems in the central region allow for year-round agriculture, most agricultural households grow monocultures. Specifically, the planting of in-season rice and off-season rice accounts for 88% of the households that are engaged in monoculture rotation.¹¹
- According to the FAO's COVID-19 country assessment, when compared to their respective levels of income before the pandemic farm households were adversely affected by an income loss of 39% while general households experienced an income loss of 16%.¹² The pandemic impacted incomes of women, largely in the informal sector, and added disproportionately to their share of care work. Approximately 44% of the workers in the informal sector are women.¹³
- Thailand is a gateway to Southeast Asia and the Southwest Pacific, located in close proximity to China and India. It is the second largest economy in Southeast Asia, with an open economy and participation in many bilateral and multilateral trade agreements, allowing businesses to engage in virtually tariff-free or low-tariff trade.
- Thailand's 4.0 policy intends to transform traditional farming into smart farming, or Agriculture 4.0, by using technologies and innovations. The policy promotes technologies in the agriculture sector as a smart farming model; they will be implemented in crop cultivation, livestock farming, and aquaculture. Smart farming aims to enhance agricultural production and processes with the use of technologies and digital components like remote sensing, geo-mapping, and drones.

2.2 Energy/Water

- Thailand's total primary energy supply (TPES) reached 122.5 Mtoe in 2017. Oil accounted for the largest share (36.1%), followed by natural gas (31.2%), coal (12.2%), and others (20.2%). In 2017, net imports of energy accounted for 58% of TPES.¹⁴
- Thailand's Power Development Plan (PDP) sets out a plan for a power production split between natural gas (53%), non-fossil fuels (35%), and coal (12%) by 2036.¹⁵
- In 2020, Thailand generated 205,995 GWh of electricity, and consumed 187,0446 GWh. The agriculture sector consumes only 417 GWh (0.2%).¹⁶

- The power industry in Thailand is subject to strict regulations. Any power supplied via the national grid is subject to the directives of the 20-year national Power Development Plan (PDP).¹⁷
- The government launched the Water Resources Management Strategic Plan 2015–2026 as a main strategy to develop a sustainable water management plan in Thailand. The Office of the National Water Resources, the Ministry of Interior, the Ministry of Agriculture and Cooperatives, and the Ministry of Natural Resources and Environment will serve as core agencies in mobilizing the implementation of this strategic plan.¹⁸
- The Department of Water Resources has established river basin organizations for all 25 river basins. The established river basin bodies mobilize water resources management with participation from all sectors.¹⁹
- According to the 2017 farmer registration, only 42% of farmers have access to water resources, and merely 26% of agricultural households have access to irrigation systems; most of them are concentrated in the central region, the lower north region, and Bangkok and its vicinity.²⁰
- The Cloud Asset's Digital Solution for Water Management integrated over 40 databases, data from satellites, and over 30,000 sensors to provide Thailand with near real-time monitoring and management with short-term and long-term forecasting for water availability, flood, and drought predictions.²¹
- 100% of Thailand's population has access to electricity, but almost half of the energy consumed is from imported sources. As of 2015, Thailand used natural gases, lignite, and hard coal to produce 89% of its electricity, and used renewable energy sources for 10%. Based on the 2017 Renewable Energy Outlook for Thailand, 50% of the electricity generated from renewable energy is sourced from bagasse and 29% from agricultural waste. However, the agriculture sector only consumes 0.4% of the electricity produced.
- Agriculture uses 71% of the total amount of available water in Thailand, and 90% of Thailand's freshwater resources. The total land area of Thailand is around 513,000 sq. km., of which 52% is suitable for agriculture. Only about 25% of agricultural land is irrigated. Agriculture is dependent on regular rainfall, the annual average of which is 1,700mm. Thailand's rainy months are May to October.
- Thailand has adopted a new government policy "Thailand 4.0" which has been considered as a new model as Thailand's economic engine restructures the economic structure toward a "value-based economy" and it aims to transform from traditional agriculture to a new era of agriculture, which emphasizes modern business entities and technology management as agriculture 4.0.²²
 - o The Thailand 4.0 Program targets increasing the average annual income of farmers seven-times from 56,450 THB (\$1,765 USD) to 390,000 THB (\$12,190 USD) by 2037. A key part of these attempts is promoting more multi-stakeholder cooperation and investments, as well as improving livelihoods in a way that is right for people and the planet, especially through precision agriculture.
 - o The Thailand 4.0 strategy is driving this shift through strategic and enabling government policies that support the advancement of farms with modern technologies, precision agriculture tools, and data-driven smart farming solutions. There are currently a number of agriculture projects using

the Smart Farmer Model to empower farmers.

- o Examples include Dtac, part of the Telenor Group, and Yara, a firm specializing in agricultural products and environmental protection agents in Thailand. These two firms are collaborating to bring together agricultural knowledge and digital connectivity to deliver unparalleled access to agricultural information and resources to empower smallholder communities.²³ Additionally, Mahidol University and Granmonte Farm have joined forces to develop a micro-climate monitoring system that is used to increase production, prevent risks, and manage irrigation systems. Thammasat University developed Smart Farm Kit, an automated irrigation system. CAT Telecom Public Company Limited (CAT) is also putting an Internet of Things (IoT) technology to work in the service of Thai agriculture under its CAT Digital Come Together initiative. The initiative merges conventional agricultural skills and knowledge with cutting-edge IoT technology to help with a variety of farming functions, including weather analysis and intelligent irrigation control. The new technology will provide farmers with the data they need to formulate effective planting schedules, which is expected to bring benefits like higher crop yields and higher quality produce, along with reduced operating costs, cultivation times, and energy usage.²⁴
- o Another example is the Thai Rice NAMA project. The Ministry of Agriculture and Cooperatives (MOAC), in cooperation with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), is supporting Thai farmers' adoption of climate-friendly technologies including laser land levelling (LLL) technology, alternate wetting and drying (AWD), site specific nutrient management, and straw and stubble management, to increase yields, save water, and reduce greenhouse gas emissions in the Central Plains.²⁵

2.3 Investment and End-user Finance

- The Agriculture and Cooperatives Ministry announced plans to establish 3,000 foreign investment funds to support Thai farmers and deal with food shortages. Private agencies joining the project will cooperate with the Global Blockchain Fund Platform to establish funds that attract investment from foreign investors.²⁶
- The Bangkok Bank of Agriculture and Agricultural Cooperatives (BAAC) announced plans to allocate as much as \$3.3 billion USD to introduce and implement smart farming to 4,500 Thai farmers nationwide, starting in 2020.²⁷
- In January 2021, the Asian Development Bank (ADB) and the Government of Thailand announced a \$2 million USD technical assistance grant to help promote the adoption of climate-smart agriculture in the highlands of Northern Thailand.²⁸
- Foreigners are not allowed to be members of, or invest in co-operatives, so they generally use a limited company to invest in or do agricultural business in Thailand.²⁹
- Under the Land Code B.E. 2497 1954, foreign persons, either individual or legal persons, cannot own any type of land in Thailand, including agricultural land, unless they obtain permission from government authorities under specific laws.³⁰
- Thailand has taken steps to reform its business regulations by improving processes and reducing the time required to start a business, from 29 days to 6 days. Thailand has also steadily improved its ranking in the World Bank's Doing Business Report in the last several years and now occupies the 21st position in the 2019 ranking.³¹

- SMEs are 99% of all the enterprises operating in Thailand, 78.48% of all job employment, and 29.01% of exports; the government has given more attention to SMEs. The government has also previously set a target to increase contributions by SMEs to national GDP up to 50% by 2021. Currently, SME's contribution to national GDP is approximately 42.2%. The government plans on achieving this by supporting innovation-driven SMEs that aim to offer high-value products and services (e.g., high-value start-ups, smart SMEs, smart farmers, and global SMEs) through the five-year SME Promotion Plan of the Office of SME Promotion (OSMEP).
- The government introduced the Thailand 4.0 scheme with the objective of promoting, encouraging and supporting both the public and private sectors, including MSMEs and entrepreneurs, to adopt, upgrade, and use innovation and technology in many aspects to enhance capacity and efficiency.
- By introducing Thailand 4.0, the government had set their target to modernize MSMEs into innovation-driven MSMEs, with clear indicators to initiate creative and innovative business models; encourage technology usage with research and development (R&D) support; and increase MSME's responsiveness toward the world market demand. Many MSME-related agencies and science/technology-related agencies have setup plans to encourage innovation in MSMEs for the Thailand 4.0 scheme. Examples include:
 - o Formulating SMEs promotion plans as the main strategy and upgrading technology, innovation, and productivity.
 - o Organizing events once a year like the Thailand Synergy for Thai SMEs, STI Thailand Award, and the Science Technology and Innovation Association.
- Among them, only 1.4% of the SMEs are involved in agriculture. Bank loans are the main source of financing for small and medium enterprises. There are over 30 commercial banks, several specialized financial institutions, cooperatives, and other community-level financial institutions active in providing loans. The Bank of Thailand is the country's central bank that guides financial institutions on the classification and definition of SMEs.³²
- SME access to commercial bank loans is constrained due to their general lack of credit history, collateral, and reliable financial statements. Only 16% of Thai firms have a bank loan and a mere 15% use banks to finance investments.³³ To tackle these limitations, the government has introduced various measures to ease SME access to funding. In addition, the government has launched capacity-building programs to boost SMEs' competitiveness.³⁴
- The financial gap for women-owned SMEs is estimated to be \$25 billion USD in Thailand. Access to bank loans for working and investment financing is challenging for women-owned enterprises.
- Specialized financial institutions (SFIs) are mandated to provide financial access to those that are underserved by commercial banks. Besides SFIs, savings and credit cooperatives and credit unions provide significant amount of financial services to households, according to the Thailand Financial Sector Assessment Program in 2019.
- One of Thailand's largest universal banks, Bank of Ayudhya (locally known as Krungsri) issued the Women Entrepreneurs Bonds. Leveraging the financial innovation of a gender bond to augment access to financing for women entrepreneurs in Thailand, Krungsri raised up to \$220 million USD.

IFC, a member of the World Bank Group, provided up to \$150 million USD as anchor investment and helped mobilize an additional \$70 million USD from DEG (Deutsche Investitions und Entwicklungsgesellschaft).

2.4 Environmental, Social, and Governance (ESG)

- In Thailand, the application of ESGs in corporate business models is gaining traction. Sustainability, biotechnology, and green technologies are key pillars of Thailand's national development strategy, and Thai companies have increasingly been adopting policies and practices in line with sustainability.
- In 2019, Thai ESG funds benefitted from about \$100 million USD in inflows. In 2020, they enjoyed a four-fold increase with net inflows of \$486 million USD. Investors have invested in sustainable Thai businesses, as the asset value of Thai ESG mutual funds has quadrupled to over \$1 billion USD since 2019.
- Thailand ranked 75th out of 153 countries in the Global Gender Gap Index in 2020.³⁵ Women in Thailand play a key role in Thai businesses, accounting for over 40% of small and medium-sized enterprises (SMEs).³⁶
- In the 2019 Climate Risk Index, Thailand was ranked 34th out of 174 countries, with total score of 43.17.³⁷
- More than half of workers in Thailand are informal, meaning they are not covered by a social security scheme; the agriculture sector has the biggest portion with a 92% informality rate. In response to the COVID-19 pandemic, the government provides a cash transfer of 5,000 baht per month for six months for informal workers not covered by the Social Security Fund.³⁸
- The Government of Thailand is now promoting the Thailand 4.0 model to escape its middle-income level trap. The model uses an innovative "value-based economy" for climbing up to the high-income level. The three main elements of this are: (i) a knowledge-based economy; (ii) an inclusive society with equitable access; and (iii) sustainable development.³⁹
- About 40% of farming households earn an annual income below Thailand's poverty line of 32,000 THB (\$1,025 USD); 30% of farming households have debt levels above the average annual farming income per person; and 10% have three times higher debt.⁴⁰
- Thailand was ranked 104th out of 180 countries in the Corruption Perceptions Index (PI) in 2020, with a score of 36 out of 100.⁴¹
- Excessive salinity in soil and water caused by seawater negatively impacts crop yield. Other climate change impacts such as higher temperature, change in rainfall patterns, and extreme weather patterns are also likely to negatively impact agricultural productivity.
- Thailand has well adopted the Gender Equality Act. The country ranks 73rd in World Economic Forum's Gender Gap Index 2020.

3 BUSINESS-LEVEL: PRIORITIES AND RESOURCES FOR INNOVATORS IN THE WATER-ENERGY-FOOD NEXUS

3.1 Business Operations

- Thailand's Global Competitive Index 4.0 ranked 38th place out of 140 countries in 2018 and the World Bank Group's 2020 Ease of Doing Business Report ranked Thailand 21st out of 190 countries.⁴²
- The Board of Investment (BOI) provides investment assistance in the form of admissions for land acquisition, tax incentives, reduction or exemption from import duties for raw materials or machinery required for production, and simplification of application proceedings for a work permit, if the local company contributes to Thailand's progress.⁴³
- The government established the One Start One Stop Investment Center (OSOS) which operates as part of the Board of Investment (BoI). The OSOS provides comprehensive information and assistance to facilitate investors who wish to start or expand businesses, as well as invest in Thailand.⁴⁴
- The Board of Investments offers attractive incentives to projects in alternative energy. Tax-based incentives include exemption or reduction of import duties on machinery and raw materials, and corporate income tax exemption for up to eight years. Non-tax incentives include permission to bring in ex-patriates, own land, and take or remit foreign currency abroad.⁴⁵
- The Thai government in 2019 passed new laws and regulations on cybersecurity and personal data protection that have raised concerns, given Thai authorities regard for confidential and sensitive information and introducing new uncertainties in the technology sector. Internet penetration in Thailand stood at 69.5% with 48.59 million internet users in January 2021.⁴⁶ As of 2015, the percentage of women using internet in Thailand is 38.9% and men is 39.7%.⁴⁷
- Thailand is the second largest economy in Southeast Asia and serves as a hub for the ASEAN continent. It is one of the fastest growing economies in the region and ranks number one in net exports. The country is a leader in the production and export of several agricultural commodities, such as rice, rubber, and fishery products,
- Thailand is primarily a service economy with a strong financial sector and, due to the minimum cost, anyone can start a small business in Thailand.

3.2 Tax Policy

- Generally, the rate of corporate income tax (CIT) is, at maximum, 20% of net profit. However, the rate varies based on the type of taxpayer. A tax reduction of 15% to 30% is granted to SMEs, and flat rates of 20% and 25% are granted to companies listed on the Market for Alternative Investment (MAI), and companies listed on the Stock Exchange of Thailand (SET).⁴⁸
- Foundations and associations engaged in business activities are subject to a 2% or 10% tax rate of gross business, income depending on the category of income.⁴⁹ For income from business, commerce, agriculture, and industry transport, the tax rates are, at minimum, 2%, and income from non-operating income (interest, dividend, capital gain, etc.) are 10%.⁵⁰
- Associations and foundations registered under Thai law are subject to pay corporate income tax on

gross income before the deduction of any expenses. See Annex 5 for more detail.

3.3 Market Growth

- Rice is a key food crop in Thailand. It involves 3.55 million households of rice farmers. Rice cultivation areas account for almost 40% of the total agricultural area in Thailand, according to the Office of Agricultural Economics. Rice production consumes the largest volume of water in Thailand, when compared to other crops and sectors. This is a major issue because Thailand has water scarcity in some watersheds for periods of time, especially the Chao Phraya Watershed which is the second main (irrigated) rice production area in Thailand.⁵¹
- The government has set a target to increase contributions by SMEs to the national GDP by up to 50% by 2021. They will achieve this by supporting innovation-driven SMEs that aim to offer high-value products and services through the five-year SME Promotion Plan of the Office of SME Promotion (OSMEP).⁵²
- The agriculture sector in Thailand is growing, with 2.2% growth rate for 2020. The industry has been supported by the Thai government through several policies trying to stabilize agri-outputs and seeking ways to ensure the sector is growing healthily and sustainably.
- The government has adopted several multi-year policies, such as a pledge to double farmer incomes and become self-sufficient in pulses over an unspecified short-term period.⁵³
- Agri-tech start-ups, like Ricult, Eden Agritech, Algaeba and KoMoMi, are growing and changing the landscape of farming in Thailand.
 - o Ricult provides information to farmers on soil analysis, pests, weather alerts, and when to irrigate.
 - o Eden Agritech has developed an innovative spray that coats fresh-cut fruit with non-chemical, edible substances.
 - o Algaeba provide sustainable seafood through its innovative aquaculture technology.⁵⁴
 - o KoMoMi offers IoT-powered irrigation monitoring solutions to farmers and allows customized scheduling and control over the water supply for different zones.⁵⁵

3.4 End-User Access

- In response to COVID-19, the Government Savings Bank (GSB) agreed to lend 10,000-50,000 THB to each debtor, at interest rates of just 0.1-0.35% a month.⁵⁶
- Thailand's Ministry of Finance implemented tax and non-tax relief measures to aid the general public, workers, and entrepreneurs; including reduction of withholding tax from 3% to 1.5% for the payments made between April 1, 2020, and September 30, 2020.⁵⁷
- The Bangkok Bank of Agriculture and Agricultural Cooperatives (BAAC) transferred a subsidy of 5,000 THB to 7.1 million farmers by May 2020, the total subsidy amount is worth 35.51 billion THB.⁵⁸
- Members of co-operatives and farmers' groups receive financial support for debts and expenses for certain cash crops.
- Thailand founded the National Village and Urban Community Funds in 2001, the same year as the People's Bank Program of the GSB, and the Thai Women Empowerment Funds (WEF) with a 7.7 billion

THB fund (approximately \$236 million USD) in 2012 and an additional 100 million THB (approximately \$3 million USD) in 2015. The fund is divided into two types: (i) revolving funds with interest rate of 3% a year, and (ii) subsidy funds.⁵⁹

- Credit for business operations is available through commercial banks and financial institutions. SFIs, cooperatives, and community FIs, are more accessible to SMEs in terms of credit facilities.
- In response to COVID-19, the Government of Thailand has allowed eligible SMEs to claim a 150% deduction for interest expenses on loans obtained under a funding initiative to provide 150 billion THB in soft loans to SMEs with an interest rate of 2% for the first two years. The interest must have been incurred during the period of April 1, 2020, to December 31, 2020.
- The government approved another 3.04 billion THB in COVID-19 relief handouts under the Rao Chana (We Win) program, extending the subsidy to another 2.4 million people. Under this program, the government provides a total of 7,000 THB for each person registered as being affected by the pandemic. Approved applicants can use the subsidy to buy food, drinks, and essential goods.⁶⁰
- About 2.7% of the Thai population does not have access to financial services and 5.9% do not have access to loan services, according to a Bank of Thailand survey in 2016.⁶¹ The share of adults who have an account at a formal financial institution rose from 73% in 2011 to 82% in 2018. The gender gap is modest, as 84% of men and 80% of women have an account.⁶²

3.5 Scale-up and Expansion Support

- Thailand has invested 15 billion THB to launch a country-wide village broadband network to provide affordable high-speed internet to over 25,000 villages across Thailand.
- The Thai Credit Guarantee Corporation (TCG) provides credit guarantees for viable SMEs to ensure that SMEs with insufficient collateral have access to bank loans.⁶³
- The Market for Alternative Investments (MAI) is a stock exchange for smaller firms. Through the MAI exchange, SMEs can raise capital if they have over 50 million THB in paid-up capital following an IPO.⁶⁴
- The Office of Small and Medium Enterprises Promotion (OSMEP) is preparing to launch co-pay program. In this program, the government will pay 50%-80% of the SME's various expenses (e.g., fees for product testing, certification registration, business consultation relating to accounting and agriculture and food standards.)⁶⁵
- The Agriculture Development Strategy (2017-2022) prioritizes innovation in agriculture and the development of smart agriculture in Thailand, which is expected to increase productivity and efficient use of water and energy resources.
- Renewable energy is one of the top priorities of Thailand. The Alternative Energy Development Plan (AEDP 2015) has set a target to increase renewables (whether in the form of electricity, heat, or biofuels) up to 30% of the country's final energy consumption by 2036.

4 WE4F INNOVATIONS MARKET READINESS: FACTORS INFLUENCING ADOPTION OF INNOVATIONS

Actors	Opportunity	Threat
Digital penetration	- Internet penetration in Thailand stood at 69.5%, with 48.59 million internet users in January 2021.⁶⁶	- The cost of information technology is still too high to justify additional productivity gains of small farms.⁶⁷ So broadband remains unaffordable for remote people with limited incomes.⁶⁸
Access to subsidies	- Government provides subsidies to farmers in form of grants, income guarantees, and price guarantees depending on the crops. - Tax and non-tax incentives are provided to innovations and investments in priority sectors: agriculture, innovation, environment, and in priority zones.	- About 40% of farming households earn an annual income below Thailand's poverty line. - Subsidies may also create more inefficiencies in the market and create dependence.
Transaction cost to reach the farmers	- Growing e-commerce technology in agriculture reduces transaction cost to reach farmers.	- Most of the villages are on the mountains or surrounded by the mountains.
Affordability	- The Thai government's micro-credit program offers a lower rate than the commercial rates. Also, innovative payment methods, like linking payment with harvests and full installments without upfront payment will help smallholder farmers to access technology. - Provision of contract farming and credit products designed for farmers.	- 8.8% of the population is below povertyline.
Innovation in Agri-tech start-ups	- Agri-tech start-ups are growing and changing the landscape of farming innovations in Thailand, examples include: Ricult, Eden Agritech, Algaeba and KoMoMi. and others.	
Access to finance for women and Bottom-up pyramids (BOP) families	- Micro-credit programs have special credit facilities for women, like the Village Fund, the People's Bank Program from GSB, and The Women Empowerment Fund, which are available to women.⁶⁹	- Female workers are concentrated in the informal sector, making them less eligible for these opportunities.

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ANNEX 1: SUMMARY OF RELEVANT POLICIES IN THE NEXUS

Agriculture

Agriculture in Thailand is governed at the national level and controlled by the Ministry of Agriculture and Co-operatives. Policies are set at the national level and then implemented in local areas through regional offices or research extensions of the Ministry of Agriculture and Co-operatives.

- The Ministry of Agriculture and Co-operatives has prepared a 20-year Agriculture and Co-operative Strategy (2017 to 2036) to secure Thai farmers' livelihoods, grow the agriculture sector, and sustain agricultural resources. The plan envisions Thai farmers to have an average national income per head of more than \$13,000 USD by 2036. The specific goals are:
 - o The specialization of farmers in their profession (Smart Farmers).
 - o Institutions for farmers for efficient management (Smart Agricultural Group).
 - o Quality of agricultural products to meet customers' needs (Smart Agricultural Products).
 - o Increased potential of the agricultural sector (Smart Area/Agriculture)
- The agricultural development plan under the 12th National Economic and Social Development Plan (2017-2021) envisions the agriculture sector moving through technology and innovations, market-led production, quality life of farmers, and balanced and sustainable natural resources. One of the strategies under this plan is balanced and sustainable agriculture resources and environment, which includes a guideline to manage water resources.
- Agricultural Standards Act B.E. 2551 2008 regulates the quality and standards of products from agriculture, fishing, livestock, forestry, and related by-products. Its main focus is ensuring the safety and quality of food and public health by:
 - o establishing the rights, obligations, and liabilities of producers, exporters, and importers.
 - o setting out clear guidelines for product standards and penalties for violations of the Act.
- Subsidies and other support for agriculture are included in the Smart Agricultural Group goal. Members of co-operatives and farmers' groups receive financial support for debts and expenses for certain cash crops. There are no overall subsidies for all crops.
- Ministry of Agriculture and Co-operatives. Under the Land Code B.E. 2497 1954, foreign persons, either individual or legal persons, cannot own any type of land in Thailand, including agricultural land, unless they obtain permission from government authorities under specific laws (for example, the Thai Board of Investment (BOI))
- The Ministry of Agriculture and Co-operatives does not have a direct policy on environmental issues. However, it does have policies that address environmental issues such as organic farming, new theory agriculture and management of natural resources. Thailand has other ministries (such as the Ministry of Natural Resources and Environment) overseeing environmental issues in different sectors.
- The government encourages foreign investors to invest in Thailand's Eastern Economic Corridor, and this has led to the Eastern Special Development Zone Act B.E. 2561 2018. This allows a lease of land in three provinces (Chachoengsao, Chon Buri and Rayong) for a term of up to 50 years, with an option to renew for another 49 years, up to a maximum of 99 years, but this is mostly for industrial purposes.⁶⁹
- MOAC in its 20-year Agriculture and Cooperative strategy has visions subsidies and other support for agriculture are included in the Smart Agricultural Group goal. Members of co-operatives and farmers'

groups receive financial support for debts and expenses for certain cash crops. There are no overall subsidies for all crops.

Energy/Water

- The Thailand Power Development Plan 2015-2036 (PDP2015) focuses on (1) Energy Security: coping with the increasing power demand to correspond to National Economic and Social Development Plan and considering fuel diversification (2) Economy: maintaining an appropriate cost of power generation for long-term economic competitiveness (3) Ecology: lessening carbon dioxide intensity of power generation.⁶⁹
- In the Thailand Integrated Energy Blueprint (TIEB), Ministry of Energy has reviewed five energy master plans during the year 2015-2036 in consistent with the national economic and social development plan. The five master plans are: The Power Development Plan, The Energy Efficiency Development Plan, The Alternative Energy Development Plan, The Oil Development Plan and The Gas Development Plan.
- The Water Resources Act B.E. 2561 2018 allocates water use into three categories:
 - o The first includes small-scale local farmers and the public, who can use water from natural resources free of charge, without water tax and a water license. Low-volume abstractions for domestic use do not require a license.
 - o The other categories include large-scale water users in the industrial sector and the tourism industry, and large-scale users who must obtain a water license and pay a water fee
- The Groundwater Act B.E. 2520 (1977) as amended (No. 2, B.E. 2530) and subsequent ministerial regulations control excessive groundwater abstraction, by enforcing measures such as: penalties and fines for non-compliance, designation of critical zones, groundwater abstraction licensing, groundwater user charges, additional groundwater preservation charges.⁶⁹
- Under the People's Irrigation Act B.E. 2482, the use of major amounts of surface water for private irrigation affecting an area larger than 200 rai (32 hectares) requires permission from the local authorities and from the District Office. In granting permission, the following will be considered:
 - o If the work is constructed for the benefit of an area up to 500 rai located in the same District, the District Commission will report it to the Ministry for Agriculture.
 - o If work is constructed for the benefit of an area up to 1,000 rai located in the same province, the Provincial Commission shall consider the granting of permission and report the matter to the Ministry of Agriculture.
- Alternative Energy Development Plan (AEDP) 2015 Thailand has set a new target for renewable energy at 30% of the total final energy consumption by 2037 through this plan.

Environment

- Climate change in Agriculture Strategy (2017-2021) highlights that agriculture is one of the most-impacted sectors by climate change, in terms of crop calendar, temperature fluctuation, extreme weather, floods and droughts. Among the four missions of this strategy, one of them is to increase capacity on climate change of farmers/farmer organizations and related business by integrating local community into water management, increasing water usage effectiveness, adoption of risk map for adaptation, and applying precision farming where appropriate.
- Total carbon dioxide emissions for Thailand in 2019 was 275.06 Mt (mega-tons). In 2019, total carbon

dioxide emissions for Thailand constituted 0.72 or 72% of the world's total.

- Therefore, from 2018 to 2019 there has been a slight decline of 4.25 Mt or 1.5% in Thailand's total carbon dioxide emissions.⁶⁹
- To curb greenhouse gas emissions in Thailand, the Energy 4.0 policy was implemented by the Thai Government in 2016. The Energy 4.0 policy includes three specific sector policies like Electricity 4.0, Fuel for Transportation 4.0 and Heat 4.0. These three sector policies will help Thailand transition to a low-carbon economy and enhance renewable energy production.
- According to the Roadmap on Plastic Waste Management 2018-2030, Thailand will phase out all plastics that degrade into fragments. In 2019, three plastic products were banned, which included plastic cap seals in water bottles, oxo-degradable plastics, and plastic microbeads. The Roadmap currently involves a private-public partnership ban on the use of plastic consisting of 33 state agencies and 43 private firms. Grocery stores and shopping malls in Thailand have also stopped giving out plastic bags while the use of four other types of plastic will be banned by 2022, which will include plastic bags less than 36 microns in thickness, Styrofoam food boxes, plastic straws, and single-use plastic cups.
- Development projects in Thailand were regulated under The Enhancement and Conservation of National Environmental Quality Act (NEQA) which was first enacted in 1975 and has been regularly revised and improved. Today the Enhancement and Conservation of National Environmental Quality Act of 1992 serves as the current legal framework for the development and strengthening of the Environmental Impact Assessment (EIA) system in Thailand with provisions on EIA screening, preparation, review, timing and monitoring. Presently, there are 35 types and sizes of projects and activities for which EIA is mandated requiring projects and activities that may cause severely adverse impacts to the community with respect to environment quality, natural resources and health to submit Environment and Health Impact Assessment (EHIA).
- Agricultural Waste Management - Thailand is the ASEAN leader in bioenergy production. One important factor is the government's long term renewable energy plan which has supported the implementation of bioenergy projects. Recovery as food, energy, fertilizer and other value-added products from agricultural wastes are already in commercial practice in agro-processing industries including the sugarcane and palm oil industries.
- Bio-Circular-Green Economic Model or BCG has been promoted by the Thai government as a new economic model for inclusive and sustainable growth capitalizing on the country's strengths in biological diversity and cultural richness and employing technology and innovation to transform Thailand to a value-based and innovation-driven economy. The model conforms with the UN Sustainable Development Goals (SDGs) and is also intended to align with the Sufficiency Economy Philosophy (SEP) which is also the key principle of Thailand's social and economic development. The BCG model is applied to focus on promoting four industries – namely agriculture and food; medical and wellness; bioenergy, biomaterial and biochemical; and tourism and creative economy. Science, technology, and innovation will be employed to enhance the capacity and competitiveness of players in the value chain, both upstream and downstream, in all four industries, coupling with innovative policy and supportive legal and financial measures.
- BCG has recently been declared a national agenda by a BCG Committee chaired by the country's

prime minister and implemented through the 2021 – 2026 BCG Strategic Plan. The plan will aim to create value addition in the food and agriculture sector. The value of this sector can be multiplied with product diversification, product differentiation, high-value and premium-quality products and services, waste reduction, resource- and land-use efficiency improvement. BCG strategy will be enabled by R&D and technologies such as customer behavior analytics, optimized waste production, smart farming technologies, traceability, food and product safety, as well as the development of high-value and novel food products.

ANNEX 2: LOCAL ENABLING ENVIRONMENT ACTORS AND STAKEHOLDERS IN THE NEXUS

Sector(s)	Name	Relevance to WE4F
Local NGOs/CSO or Policy advocacy groups		
Agriculture	Earth Net Foundation	- This program was initiated since 1999 with a main aim to promote organic farming through mobilizing local knowledge and strengthen participatory technology development. - Program's activities include training, workshop, and setting up local learning processes through "Farmer Field School" and "Participatory Technology Development".
Agriculture	Green Net Foundation	- Green Net Cooperative (GNC) is a registered "Service Cooperative" under the Ministry of Agriculture and Agricultural Cooperative since December 1993. - GNC is a social enterprise working to promote organic farming and fair trade.
Agriculture	WOCAN	- Women Organizing for Change in Agriculture and Natural Resource Management (WOCAN) is a women-led international membership network of women and men professionals and women's associations.
Water	Water Action Hub	Priority SDGs: - Increase Access to Water, Sanitation, Hygiene (SDG 6.1 & 6.2) - Water Quality (SDG 6.3) - Water Use Efficiency (SDG 6.4) - Protect and Restore Ecosystems (SDG 6.6) - Stakeholder Participation (SDG 6.b) - Water-Related Disaster Management (SDG 11.5) - o Climate Resilience and Adaptation (SDG 13.1)
Water	Samut Prakarn Wastewater Treatment Project	- The Samut Prakarn Wastewater Management project is intended to improve the environmental quality and public health in the Samut Prakarn Province in Thailand through the establishment of (i) wastewater collection and effluent monitoring systems; (ii) a central wastewater treatment plant; (iii) industrial pollution prevention and clean technology transfer programs; and (iv) institutional capacity building for government agencies responsible for wastewater management.
Energy	Mekong Energy and Ecology Network	- MEE Net was established in 2008 as a sister organization of Towards Ecological Recovery and Regional Alliance (TERRA), under the legally registered Foundation for Ecological Recovery (FER). - MEE Net has been working on energy-related ecology issues in the Mekong Region, especially electricity structure, governance and policy reform toward energy.

		and local community livelihood sustainability.
Energy and Water	Population and Community Development Association (PDA)	- Programs in Thailand to assist villages in improving their access to energy and water, a subset of these villages had Solar Powered Water System's (SPWSs) installed with the help of the PDA. These systems use solar power to pump water that is used by villagers for consumption and irrigation purposes.
Agriculture	Self-Sufficient Farming	- Helping rice farmers in the Northeast fight the war on farm debt and environmental degradation through self-sufficiency and organic farming.
Agriculture	Phu Fa Shops	- Helping the rural poor sell their farm products and handicraft so they could improve their quality of life. - Social Lab is the mechanism of finding practical solutions to serious issues in Thailand through transformative scenario planning and the collaboration between all different entities involved.
Water, Energy, Food	Krung Thai Bank Green Loan	- Loan for investment and/or working capital in project/scheme to bring about energy saving, use of alternative or renewable energy and clean energy both in case of production for own use or production for sale, pollution elimination/reduction to conserve the environment including expenses on improvement or renovation of business establishment site, building construction and related machinery and equipment.
Water, Energy, Food	Market for Alternative Investment	Implementer: Stock Exchange of Thailand - Launched in 1999, the Market for Alternative Investment (mai) was established under the Securities Exchange of Thailand Act. It aims to create new fundraising opportunities for innovative business with high potential growth. - To this end, it provides entrepreneurs and SMEs access to alternative financing for strengthening competitiveness and fostering long-term quality growth.
Agriculture, Food	Sasakawa Women's Education and Training Center (WE-TRAIN) at the Association for the Promotion of the Status of Women	Implementor: Association for the Promotion of the Status of Women - It works in the area of Human Capital Development and provides vocational training to women in sewing, cooking, hairdressing, crafts, housekeeping and Thai massage to help women gain access to income generating entrepreneurial activities. In addition, it also hosts seminars for social entrepreneurs.
Government Organization/Regulatory Bodies		
Agriculture	Ministry of Agriculture and Cooperatives	- Responsible to regulate policies and regulations related to agriculture. Has developed Agriculture development plan to be implemented throughout the country.
Water	Royal Irrigation Department	- Responsible in managing and regulating water and water resources for agriculture.

Water, Energy, Food	Board of Investment	- The Thailand Board of Investment (BoI) has a mandate to promote investment and was known as the Board of Industrial Investment until 1972. Since 2004 it has provided alternative energy projects with support, mostly in the form of tax exemptions. Examples include the following: - o Projects that target biofuel production from agricultural products and by-products, for example biomass to liquid (BTL) or biogas from wastewater, are given an eight-year corporate income tax holiday, import duty exemption on machinery and raw or essential materials used in manufacturing export products, as well as other non-tax incentives.
Agriculture	The National Bureau of Agricultural Commodity and Food Standards (ACFS)	A government agency under the Ministry of Agriculture and Co-operatives, responsible for: - Setting standards for agricultural systems, commodity and food items, and food safety. - Accreditation of certification bodies. - Food standard controls. - Promoting compliance with standards on farms and in food establishments and liaising with international trade partners on disputes about sanitary and phytosanitary measures and technical barriers to trade issues.
Water	The National Water Resource Committee (NWRC),	- NWRC established in 1988, is the most important formal body with responsibility for supervising and monitoring projects and advising the Cabinet on policies and regulations.
Water	The National Water Management Unit	- It was established in August 2017 under the Prime Minister's Office. It has a mandate to oversee the government's efforts to tackle flooding and droughts across relevant ministries and government agencies.
Water	The National Water Resources and Flood Policy Committee (NWFPCC) the Water Flood Management Commission (WFMC)	- NWFPCC and WFMC formulate policy, approve investment projects, and monitor the implementation and impact of these projects.
Water	River Basin Committees (RBCs)	- RBCs composed of government officials, user groups and experts are responsible for preparing river basin water resource management frameworks and plans.
Water	The Department of Water Resources under the Ministry of Natural Resources and Environment	- Manages surface water in non-irrigated areas and monitors flood mitigation
Water	Office of the National Environmental Board	- Entrusted with the responsibility of preparing technical advice, formulating a "National Environmental Protection Action Plan," issuing ambient and effluent standards, and promoting public awareness and engaging in public relations activities.

Water	The Department of Groundwater Resources (DGR) under the Ministry of Natural Resources and Environment	- DGR regulates groundwater use.
Water, Energy, Food	United Nations Economic and Social Commission for Asia and the Pacific	- Mentioned Water, Energy and Food security as one of resource efficiency strategies
Water, Energy,	Asian Development Bank	Some of the key activities include. - Reforming water governance. Through advocacy at global, regional, and national levels, demonstrate convincingly to developing members the critical need to manage water differently, assigning its strategic and vital value in allocation and trade-offs, and to amend governance structures and procedures accordingly. - Data and information. Support developing members in generating reliable data on the availability and behavior of water resources, in particular, groundwater. Make information on all aspects of water security accessible and place them into the public domain, including possible measures to deal with water scarcity. - Resource protection. Support developing members in more effective reduction of wastewater and other waste discharging into freshwater supplies through regulation, investment, and innovation. - Water for food. Stimulate research into improving the use of water in agriculture, increasing food production on the same area of land, and using less water; and - Increasing storage. Promote increases in strategic storage, including aquifer recharge, in response to uncertainties in supply, aggravated by climate change. - https://www.adb.org/publications/thinking-about-water-differently-managing-water-food-energy-nexus
Water, Energy Food	Stockholm Environment Institute	- Promote reduction of trade-offs and generating additional benefits that outweigh transaction costs.
Water, Food	International Food Policy Research Institute	- Publishes on the food-water-climate change nexus in scientific journals.
Energy	International Energy Agency	- Examines water for energy relationships and estimates. Total freshwater needs by energy source and region.
Water, Energy, Food	Association for the Promotion of Thai SMEs (ATSME)	- It was formed as a non-profit organization in 1981 by industrial entrepreneurs who were trained through the Department of Industrial Promotion. - ATSME provides training programs for small enterprises and also helps in matching business activities between

		members, barter trade, good exhibition, e-commerce and products exhibition internationally.
Water, Energy	The World Bank	- A report on the importance of river resources for the WFE nexus: Overcoming Barriers to International Cooperation of River Basins Critical for Food, Water, Energy Security
Water, Energy, Food	National Science and Technology Development Agency (NSTDA)	- The Industrial Assistance Technology Programme (iTAP) is an industrial technology support program for SMEs to help them meet the challenges in introducing technology-based products and processes. - The program provides assistance to SMEs and acts as an intermediary between research specialists and entrepreneurs.
Water, Energy, Food	New Entrepreneurs Creation (NEC)	Implementor: Department of Industrial Promotion, Ministry of Industry - The New Entrepreneurs Creation Programme under the Department of Industrial Promotion supports new start-ups and early-stage entrepreneurs to launch their business and build their capabilities by providing a 60-hours training program. It is offered at no cost to participants.
Food	One Tambon One Product (OTOP)	Implementor: The Royal Thai Government - Drawing its inspiration from Japan's One Village One Product program, OTOP (Tambon is Thai for sub-district) is a local entrepreneurship stimulus program to support enterprises that produce locally made and marketed products. OTOP has been one of the main SME and entrepreneurship programs in Thailand with a budget of just under THB 1 billion. The main target groups are SMEs and entrepreneurs in regional communities. OTOP covers a large array of local products, including handicrafts, cotton and silk garments, pottery, fashion accessories, household items, and foods.
Donor-funded Projects and Public Private Partnerships (PPP)		
Water, Energy	Irrigation Projects like; The Tha Chin River Barrage Project, The Mae Wong Dam Project, The Pak Mun Dam Project	- Initiated under the Royal Irrigation Department and Electricity Generating Authority Thailand and funded by World Bank and local foundations and NGOs to manage river for irrigation and electricity. - https://www.irbnet.de/daten/iconda/CIB6072.pdf
Water	Wastewater Management Authority – Ministry of Natural Resources and Environment	- The Construction of Rangsit City Municipality Wastewater Treatment Facility in Pathum Thani Province is one of the four projects under the Ministry of Natural Resources and Environment. The objective of the project is to treat wastewater in the Rangsit City Municipality, an area densely filled with houses, commercial buildings, and seeing rapid expansion of communities. Upon construction completion, the project will have 10.8 kilometers of wastewater collection pipes and will be able to clean 100,578 cubic meters of wastewater/day.

Energy	Map Ta Phut Industrial Port Phase III	- Map Ta Phut Industrial Port Phase III involves enhancements to existing infrastructure with an aim to better facilitate shipment of natural gas and raw fluid material for the petrochemical industry. - In October 2019, the Industrial Estate Authority of Thailand signed a public-private partnership agreement with a joint venture consisting of Gulf Energy Development and PTT Tank Terminal.
Energy	Power Development Plan	- During March 2020, Thailand's Power Development Plan (PDP) established targets to boost the country's wind power generation to "90MW/year from 2023-2025, with a possibility of an upward adjustment if all goes well.
Water/Energy and Food	Board of Investment (BOI)	- Board of Investment (BOI) is the key body that assists national and international investors to invest in targeted sectors by offering tax and non- tax incentives. The incentives include a corporate income tax holiday, machinery and raw materials import duty incentives, and other non-tax incentives.
Water, Energy and Food	SPACE-F	- SPACE-F is the first global FoodTech startup incubator and accelerator in Thailand, bringing together leading food-tech startups and corporates through an innovative mentorship, POC and co-working program (no equity taken) - established through the cooperation of Thai Union Group, the National Innovation Agency and Mahidol University, and supported by their corporate partners.

ANNEX 3: EMERGING PLAYERS IN THE MSME SUPPORT LANDSCAPE (INCUBATORS AND ACCELERATORS)

KEY PLAYERS	KEY ACTIVITIES
Thai Business Incubators and Science Parks Association (Thai BISPA)	- The association is served as a focal point of collaboration, business networking and linkage, knowledge sharing, and capacity development and strengthening for business incubator centers and Science Parks operations in Thailand. (https://www.thaibispa.or.th/en/) - Founded from a tripartite agreement between the National Science and Technology Development Agency (NSTDA), Office of the Higher Education Commission (OHEC) and Office of Small and Medium Enterprises Promotion (OSMEP). - The Thai Business Incubators and Science Parks Association aims to provide training workshops, advice and support from government agencies and private sector to new entrepreneurs.
Sprint accelerator	Supports startups in the field of science of technology. One of its focused sectors is Sustainable and green technology. It covers: - 3-months accelerating program for business strategy, marketing strategy, financial, IP and pitching skill - 1-on-1 mentoring with expert in various field - Networking with entrepreneurs and industrial expert - Opportunity to pitch with our VC and investment network - Free access to co-working space and laboratory - Technology trial in industrial environment (https://sprintacceleratorthailand.com/)
The Government of Thailand (Thailand 4.0" scheme)	- Introduced "Thailand 4.0" scheme and has set target to modernize MSMEs into innovation driven MSMEs with clear indicators such as to initiate creative and innovative business models, encourage technology usage with research and development (R&D) support, as well as to increase MSME's responsiveness toward the world market demand. Many MSME- related agencies and science/technology-related agencies have setup plans for encouraging innovation in MSME toward the "Thailand 4.0" scheme such as: Formulating SMEs promotion plan as the main strategy and upgrading technology, innovation, and productivity, providing grants for entrepreneurs to create innovation, and organizing events once a year such as Thailand Synergy for Thai SMEs, STI Thailand Award and Science Technology and Innovation Association. - https://asean.org/preparing-msme-4-0-thailands-4-0-economy/
The Office of SME Promotion (OSMEP)	- Promoting innovation for MSMEs through awareness creation, information, and guideline support for MSMEs to adopt innovation in various sectors. One successful example is the Innovation Coupon program, which was aimed to support SMEs for adopting innovation or create innovation by subsidized the expense/cost by reimbursement process.

	- The concept of innovation coupon is to pursue and encourage MSMEs to seek technology service providers or researchers to work on innovation toward their needs. MSMEs also can team up with their technology service providers or researcher partner to apply for the coupon or they can visit OSMEP in order to seek and match with proper technology service providers or researchers. The MSMEs that would like to apply for the innovation coupon must pass the selection process conducted by the committee. - https://asean.org/preparing-msme-4-0-thailands-4-0-economy/
DEPA Accelerator X Techsauce	- Jointly organized by the Digital Economy Promotion Agency (DEPA) and Techsauce Media. They support startups that want to work with the Thai government and have a focus in several field including agritech & foodtech. - https://kr-asia.com/a-comprehensive-guide-to-accelerators-taking-thai-startups-to-the-next-level
FinLab	- Has launched <i>Smart Business Transformation Programme</i> to help Thailand-based small- and medium-sized enterprises (SMEs) transform their businesses through digital solutions. The program is supported by United Overseas Bank (Thailand) (UOB (Thai)) and the Digital Economy Promotion Agency (DEPA) of Thailand. - https://techsauce.co/news/the-finlab-launches-thailands-first-business-accelerator-for-smes
Spark Thailand	- Business Accelerator focused on MSMEs and startups that provides support through coaching, mentorship, financing, and working space. - http://sparkthailand.co/program/
BANPU Public Company Limited and ChangeFusion	- The BANPU Champions for Change program, which began in 2011, aims to enable young people to drive social change through providing seed funding and incubation support. To target early-stage social enterprises, winning teams are selected on the basis of: 1. Social Impact - the possibility to create social change substantially. 2. The Team - capability and dedication. 3. Improvement - ability to operate efficiently in the given time of three months after receiving THB 50,000 in the first round. 4. Business Sustainability - judging from cash flow performance and ability to enter the market; and 5. Maximization - ability to operate in the long run with substantial profit and social value.
BKIND: Socially Responsible Investment Mutual Fund	- Collaboration between ChangeFusion, BBL Asset Management Co., Ltd. (BBLAM) and Khon Thai Foundation - The BKIND invests into "equities of companies listed on the Stock Exchange of Thailand (SET) and/or the Market for Alternative Investment (mai) or other secondary markets of the SET. It invests mainly in companies that exercise social responsibility in Environment, Social, Governance and Anti-Corruption (ESGC). Mutual Fund - The investment portion is at the discretion of the fund manager. The remaining assets will be invested in other equity instruments not

	mentioned above, including unlisted securities, debt instruments, financial instruments and/or deposits, as well as securities or other assets or earnings by other means as stipulated or approved by the Office of the Securities and Exchange Commission (SEC).
ChangeVENTURES	- ChangeVENTURES invests and supports social enterprises through providing early-growth stage funding (equity and debt), and hands-on business development support such as strategy, accounting, finance, marketing and design.
CIMB Thai Bank CleanEnergy Loan	The loan attempts to support clients for investment on machinery and equipment in relation to energy efficiency and renewable energy projects. It is a long-term loan with a maximum period of 7 years. Clean energy projects which will be qualified for CIMB Thai CleanEnergy Loan must comply to one of the followings: Manufacturing: - Efficiency improvement in fuel combustion system - Protection for energy loss - Waste energy recovery - Renewable energy - Change of energy source. - Efficiency improvement of electricity equipment - Efficiency improvement of machinery, equipment or process control - Other energy efficiency measures which are subjected to Bank's consideration. Construction: - Solar heat reduction - Ventilation and temperature control - Energy efficiency materials - Lighting efficiency improvement - Installation of machinery, equipment, or material for building energy reduction - Control system for energy efficiency - Other energy efficiency measures which are subjected to Bank's consideration. Qualified Expenses Relating to the Projects: - Machine, equipment and installation expense - Project consulting fee or energy service company fee - Expense which are necessary for the installation of machinery and equipment such as machinery foundation, natural gas piping - Transportation, removal and demonstration expense, import tax, and value added tax of mentioned items
Small and Medium Enterprise Development Bank of Thailand (SME Bank)	The SME Bank was established in 2002 and is majorly owned by the government of Thailand. It functions as an arm of government policy for business development rather than a purely commercial bank to assist SMEs start, expand, or improve their businesses by providing loans, guarantees and other services. Some examples on the type of loans provided by the SME Bank are: 1. Fast Track Loan 2. Loan for Thai Workers Going Abroad 3. Loan under Financial Cooperation for the Development of Grassroots Economy 4. Loan under for Assets Capitalization Scheme 5. Loan for Modernization of Poultry Farms

	In 2014, SME Bank launched a venture capital fund to support high-potential SMEs which are screened by the Office of Small and Medium Enterprise Promotion.
K-SME Venture Capital Fund	- The K-SME Venture Capital Fund was formed by Kasikorn Bank in the form of a limited company. K-SME invests in SMEs with a period of 3 to 5 years. The investment may be in common stock, preferred stock or other equity linked instruments. K-SME is managed by Khao Kla Venture Capital Management Co., Ltd. which is a wholly owned subsidiary of Kasikorn Asset Management Co., Ltd.
SME Bond Project	- Implementers/Investors: The Thailand Securities and Exchange Commission (SEC), the Thai Bond Market Association, TRIS Rating Company Limited, Fitch Ratings (Thailand), Bond Electronic Exchange, Thai Listed Companies Association, MAI Listed Companies Association, the Federation of Thai Industries, and the Thai Chamber of Commerce. - The SMEs Bond Project was a collaborative effort that aims to promote another fund mobilization channel for SMEs through the issuance of bonds and bills. Privileges for SMEs Bond Project participants included lower rating fee under specific terms and conditions from TRIS Rating Co., Ltd. and Fitch Ratings (Thailand) Co., Ltd., discount on registration admission fee, annual fee and training fee from Thai Bond Market Association, project publicity by BEX, the Thai Listed Companies Association and MAI Listed Companies Association, and nationwide information distribution by the Federation of Thai Industries and Thai Chamber of Commerce. The SEC waived application fee for product approval and reduced submission fee for initial registration statement.
SME Private Equity Trust Fund	Implementer: Krung Thai Bank, Stock Exchange of Thailand (SET), National Science and Technology Development Agency (NSTDA) - In July 2016, Krung Thai Bank set up a THB 2.3 billion SME Private Equity Trust Fund in collaboration with the SET and NSTDA. The trust will invest in high-growth start-ups, technology-based SMEs and large-sized suppliers. Krung Thai Asset Management and One Asset Management are the trust's managers.
Thai Young Philanthropist Network (TYPN)	- Founded in 2008, TYPN is a network of young social-minded professionals with a shared mission to make a positive difference to Thailand. TYPN offers a youth entrepreneurship training program that provides business consultation and business planning training to students and teachers. They also host a social enterprise business plan competition to incubate upcoming young Thai entrepreneurs.
True Incube	- A tech accelerator program in Thailand that targets all stages of startups to receive support to launch a successful product. - The program usually goes on for 10 weeks where True Incube provides a seed fund of USD 18,000 to selected startups and offers other perks such as a trip to Silicon Valley for the winner and mentorship by a wide selection of mentors in Thailand and 500 Startups Network.
SEED Practitioner Labs for Climate Finance	- SEED Practitioner Labs for Climate Finance invite leading investors, banks, development finance institutions, foundations, governments, innovators, and intermediaries to jointly address major financing challenges that face small and medium-sized eco-inclusive enterprises and climate-smart infrastructure investment in developing

	and emerging economies.
The Women's Entrepreneurship Accelerator	- A multi-partner initiative designed to inspire, educate, and empower women entrepreneurs around the world. With no qualifying barriers to participate, the ground-breaking initiative is a strategic collaboration developed in consultation with six United Nations agencies: UN Women, United Nations Office for Partnerships (UNOP), International Labour Organization (ILO), International Trade Centre (ITC), UN Global Compact (UNGC), and the United Nations Development Programme (UNDP). https://www.we-accelerate.com/about/

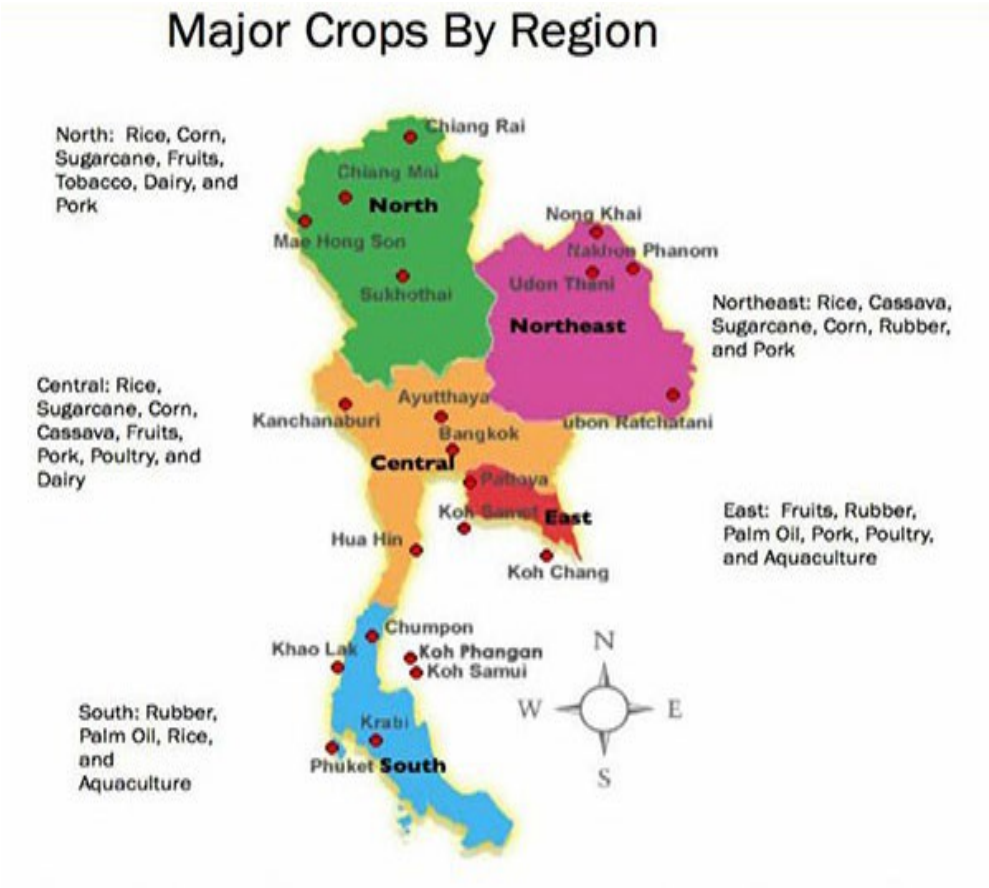
ANNEX 4: TAX PROFILE

The rate of income tax for juristic companies and partnerships is 30% of net profits. Reduced rates at the progressive rates of 15% to 30% are granted to small and medium sized enterprises ("SMEs"). Associations and foundations registered under the Thai law are subject to pay corporate income tax on gross income before the deduction of any expenses. The tax rates vary between 2% and 10% for associations and foundations involved in business activities. For income from business, commerce, agriculture, and industry transport, the tax rates are minimum i.e., 2%. In general, the sale of goods or provision of services that are necessary for the maintenance of life and social welfare will be exempt from VAT, including the sale of unprocessed agriculture products.⁶⁹

Direct tax	<i>Income Tax</i> The corporate income tax (CIT) rate is: ○ Net profit THB 0 to 300,000: 0 ○ Net profit THB 300,001 to 3 million: 15% ○ Over 3 million: 20% - In addition, tax at the rate of 10% is imposed on the after-tax profit repatriated to the head office. - A foreign company not carrying on business in Thailand is subject to a final withholding tax (WHT) on certain types of assessable income (e.g. interest, dividends, royalties, rentals, and service fees) paid from or in Thailand. The rate of tax is generally 15%, except for dividends, which is 10%, while other rates may apply under the provisions of a double tax treaty (DTT)
Indirect tax	<i>Capital gains taxes:</i> - Capital gains on the sale of investments derived from or in Thailand by a foreign company not carrying on business in Thailand are subject to a tax of 15%. - Gains on the sale of government bonds earned by a non-resident are subject to 15% withholding tax, unless otherwise reduced or exempt under a double tax treaty. <i>Value Added Tax (VAT): 10%</i> - VAT as prescribed in section 80 of the Revenue Code is 10% (on 23 September 2020, the Thailand VAT Royal Decree (No. 715) BE 2563 was announced, which extended the VAT rate of 7% for 12 months until 30 September 2021)
Additional Tax incentive	The Thai Board of Investment (BOI) grants both tax and non-tax incentives to qualifying investment projects in Thailand, available equally to both Thai and foreign investors. The incentives include a corporate income tax holiday, machinery and raw materials import duty incentives, and other non-tax incentives. - Eight years of corporate income tax exemption (with or without a maximum cap), - Five years of corporate income tax exemption, - Three years of corporate income tax exemption Other incentives also include: - Withholding tax exemption for dividend distribution during the tax holiday. - 100% foreign ownership in certain businesses reserved under the FBA. - Customs duty exemption or reduction for imported raw materials and machinery. - Land ownership for foreign companies. - Withdrawing or remitting money abroad in foreign currency. - Visa and work permit privileges for expatriates

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| | <ul style="list-style-type: none">- Export-oriented projects will receive import duty exemption on raw or essential materials used in export products or products imported for re- export. Additional incentives from other government organizations are also available for goods produced for export. For example, VAT is applied at a 0% rate to exported goods. The imports of raw materials, parts, and components for export projects are also generally exempt from import duty.⁶⁹ |
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ANNEX 5: MAJOR CROP MAPS



Source: Retrieving from Thailand agriculture overview <https://th.usembassy.gov/thailand-agriculture-overview03>



Government of the Netherlands



Sweden
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