

THAILAND 2035: HORIZON SCANNING OVERVIEW

An assessment of critical factors impacting Thailand's development prospects to 2035



The world leader in global business intelligence

The Economist Intelligence Unit (The EIU) is the research and analysis division of The Economist Group, the sister company to The Economist newspaper. Created in 1946, we have over 70 years' experience in helping businesses, financial firms and governments to understand how the world is changing and how that creates opportunities to be seized and risks to be managed.

Given that many of the issues facing the world have an international (if not global) dimension, The EIU is ideally positioned to be commentator, interpreter and forecaster on the phenomenon of globalisation as it gathers pace and impact.

EIU subscription services

The world's leading organisations rely on our subscription services for data, analysis and forecasts to keep them informed about what is happening around the world. We specialise in:

- **Country Analysis:** Access to regular, detailed country-specific economic and political forecasts, as well as assessments of the business and regulatory environments in different markets.
- **Risk Analysis:** Our risk services identify actual and potential threats around the world and help our clients understand the implications for their organisations.
- **Industry Analysis:** Five year forecasts, analysis of key themes and news analysis for six key industries in 60 major economies. These forecasts are based on the latest data and in-depth analysis of industry trends.

EIU Consulting

EIU Consulting is a bespoke service designed to provide solutions specific to our customers' needs. We specialise in these key sectors:

- **Healthcare:** Together with our two specialised consultancies, Bazian and Clearstate, The EIU helps healthcare organisations build and maintain successful and sustainable businesses across the healthcare ecosystem. Find out more at: eiu.com/healthcare
- **Public Policy:** Trusted by the sector's most influential stakeholders, our global public policy practice provides evidence-based research for policy-makers and stakeholders seeking clear and measurable outcomes. Find out more at: eiu.com/publicpolicy

The Economist Corporate Network

The Economist Corporate Network (ECN) is The Economist Group's advisory service for organisational leaders seeking to better understand the economic and business environments of global markets. Delivering independent, thought-provoking content, ECN provides clients with the knowledge, insight, and interaction that support better-informed strategies and decisions.

The Network is part of The Economist Intelligence Unit and is led by experts with in-depth understanding of the geographies and markets they oversee. The Network's membership-based operations cover Asia-Pacific, the Middle East, and Africa. Through a distinctive blend of interactive conferences, specially designed events, C-suite discussions, member briefings, and high-calibre research, The Economist Corporate Network delivers a range of macro (global, regional, national, and territorial) as well as industry-focused analysis on prevailing conditions and forecast trends.

Contents

ABOUT THIS REPORT	2
ABOUT THE ECONOMIST INTELLIGENCE UNIT	3
ABOUT THE INSTITUTE OF PUBLIC POLICY AND DEVELOPMENT	4
INTRODUCTION	5
AGEING AND NEW WAYS OF WORK	7
BIOTECH	9
CHANGING GEOPOLITICS	12
DISASTER RISK	15
FOURTH INDUSTRIAL REVOLUTION AND 21ST-CENTURY SKILLS	17
INEQUALITY	20
MIGRATION	22
TECHNOLOGY AND POLITICS	25

About this report

This report builds on a research programme undertaken by The Economist Intelligence Unit (The EIU) between November and December 2019 and commissioned by the Institute of Public Policy and Development (IPPD). The views and opinions expressed in this publication are those of The Economist Intelligence Unit and do not necessarily reflect the official position of the IPPD. The report contains the key-findings of a horizon scanning exercise that explores critical factors that could have a significant impact on Thailand's prospects to 2035. Analysis on the factors benefited from the input of several thought leaders. We would like to thank the following experts for their time and insights:

Mr Roongrote Rangsiyopash	President and CEO, SCG
Dr Kitipong Promwong	Director of Policy Research and Management, National Science and Technology Policy Office
Dr Soraphol Tulayasathien	Executive Director, Institute of Public Policy and Development
Mr Renaud Meyer	Resident Representative of UNDP
Dr Vipap Prachuabmoh	Dean of College of Population Studies, Chulalongkorn University
Dr Singh Intrachotoo	Director, Research & Innovation for Sustainability Center
Dr Nattapong Puttanapong	Lecturer, Faculty of Economics, Thammasat University
Dr Arm Tangnirandorn	Lecturer, Faculty of Law, Chulalongkorn University
Dr Anuk Serichetpong	Economist, UNDP Thailand
Dr Napat Jatusripitak	Founder and CEO, Siametrics Consulting & Analytics
Dr Chartchai Na Chiangmai	National Institute of Development Administration
Ms Jinna Tunsaraviput	National Economic and Social Development Council
Ms Supaporn Wongwatanasir	National Economic and Social Development Council
Ms Sukjai Wongwaisiriwat	Senior Economist, Bank of Thailand

About The Economist Intelligence Unit

The Economist Intelligence Unit (The EIU) is the research arm of The Economist Group, publisher of The Economist. As the world's leading provider of country intelligence, we help governments, institutions and businesses by providing timely, reliable and impartial analysis of economic and development strategies. Through our Public Policy Consulting practice, we provide evidence-based research for policymakers and stakeholders seeking measurable outcomes in fields ranging from gender and finance to energy and technology. We conduct research through interviews, regulatory analysis, quantitative modelling and forecasting, and display the results via interactive data visualisation tools. Through a global network of more than 350 analysts and contributors, The EIU continuously assesses and forecasts political, economic and business conditions in over 200 countries. For more information, visit www.eiu.com.

About the Institute of Public Policy and Development

The Institute of Public Policy and Development (IPPD) is a policy laboratory and impact-oriented platform whose mission is to translate idea, intelligence, evidence, and public opinion into solutions for long-term sustainable development.

The Institute consists of four labs: Foresight and Futures Lab, Data and Intelligence Lab, Design and Testing Lab and Public Opinion and Dialogue Lab. Together, they pursue innovative approaches and methods for better understanding of and solutions for key challenges and opportunities.

The IPPD is a non-profit organization under the Phraya Suriyanuwat Foundation affiliated with the Office of the National Economic and Social Development Council (NESDC). More information on the IPPD can be found at <http://www.ippd.or.th>.

Contact

www.ippd.or.th

www.facebook.com/ippd.or.th

Email: contact@ippd.or.th

Introduction

Thailand's impressive development has seen the country grow from a largely agricultural economy into one of ASEAN's leaders today. Thailand is now an upper middle-income economy with a GDP of US\$530bn and relatively large industrial and services sectors, accounting for 35% and 56% of the country's GDP, respectively. Several drivers contributed to this success story in the past few decades, ranging from favourable demographics to a competitive positioning of its industrial production. Looking ahead, Thailand faces both challenges and opportunities. The global economy is rapidly evolving and developments in politics, economics, technology, legal frameworks, and the environment are driving this change. Thailand's future prosperity will hinge on the country's ability to anticipate these changes and position itself competitively. Identifying and understanding the trends that underpin these changes is a critical exercise to maximise opportunities and to manage uncertainties.

The Economist Intelligence Unit (The EIU) was commissioned by the Institute of Public Policy and Development (IPPD) to conduct a horizon scanning exercise to map the factors in the contextual environment that are set to have a significant impact on Thailand out to 2035. To facilitate this process, The EIU developed a research programme that answers the following question: *"What key factors will have the greatest impact on Thailand's development in the period to 2035 and what are some of the questions that we are not actively considering today?"*

The research process was organised around several phases. First, The EIU produced a long list of fifty factors, organised through a PESTLE framework, and encompassing the political, environmental, societal, technology, and legal landscapes. These factors were presented to the IPPD and, through a structured workshop in Bangkok in November 2019, eight critical factors were selected for further analysis. These factors were identified through an uncertainty vs. impact matrix, whereby high-impact factors with varying degree of perceived certainty were shortlisted. The workshop presented opportunities to cluster factors into eight focus areas for Thailand. Preliminary analysis on these eight factors was presented to a panel of Thai thought leaders, who contributed insights and perspectives. This document outlines a high-level overview of the selected factors, which are presented as brief research notes. The following factors form part of this review:

THAILAND 2035: HORIZON SCANNING OVERVIEW

AN ASSESSMENT OF CRITICAL FACTORS IMPACTING THAILAND'S DEVELOPMENT PROSPECTS TO 2035

- Ageing
- Biotech
- Changing geopolitics
- Disaster risk and urban sustainability
- Fourth industrial revolution and 21st century skills
- Inequality
- Migration
- Technology and politics

Analysis on each factor is organised around four key questions, which address its relevance today, its expected path to 2035, known unknowns, and critical areas of uncertainty. This analysis strives to provide Thai leaders with a broad review of the factors that will affect the country in the next fifteen years and to facilitate the early identification of opportunities—as well as challenges that need addressing.

AGEING AND NEW WAYS OF WORK

As fertility declines and the country rapidly ages, Thailand will face a dual challenge of promoting population growth and providing economic opportunities and social support for the elderly.

1. Where we are

Southeast Asia is experiencing a fall in its fertility rates, with the average fertility rate dropping from 5.5 in 1970 to 2.4 in 2015, and continuing to fall. Thailand's fertility rate is among the lowest in the region at 1.58¹. At the same time, the country's population is becoming relatively older, and by 2035, about 30% will be aged 60 years and above². This demographic transition is a result of several factors. First, Thailand's National Family Planning Program focused on fertility reduction in previous decades, with reported success.^{3 4} Second, the country's rapid urbanisation (the urban population has increased from 16.5% in 1950 to about 50% today)⁵ has resulted in a higher cost of living and smaller dwellings, resulting in smaller families. Third, the female labour force participation has been relatively high (around 60% in the past two decades),⁶ which has led to women postponing childbirth to pursue economic opportunities. Finally, a socio-cultural shift from focusing on "quantity", or number of children, to "quality" in parenting has reduced family sizes. The low fertility rates and ageing population will put a strain on the country's workforce, healthcare costs, and family dynamics.

2. What we know

Thailand's median age has risen from around 18 years old in 1950 to about 40 years old today.⁷ At this pace, Thailand will transform into an aged society by 2024 – i.e. a society in which 14-21% of persons are aged 65 or older. By 2035 this proportion will increase to about 23%, the second highest in Southeast Asia after Singapore. The National Economic and Social Development Council projects Thailand's workforce (aged 15-59 years) to fall by about 6m to 37m between 2015 and 2035. The Lancet forecasts Thailand's national healthcare spending to rise from 4.1% of GDP in 2014 to 4.7% in 2040 (a bigger increase than expected in Indonesia or Malaysia).⁸ Thailand's resources to provide welfare for an ageing population are still limited, as seen in lower levels of current and projected health spending.⁸ Policy actions from the government have so far focused mainly on fertility.⁹ The National Family Planning Program, an initiative recognised for its success in introducing contraception in the country,¹⁰ has shifted its focus to slowing the decline in the fertility rate by introducing pro-natalist policies from around 2011. The Ministry of Finance has recently increased a tax deduction allowance for parents from 30,000 baht for up to three children to 60,000 baht per child. The government also provides financial incentives for children of women insured under the social security act and for families with a monthly household income of less than 3,000 baht per person.¹¹

3. What we don't know

Thailand has so far implemented policies addressing falling fertility, but it remains to be seen whether these will be sufficient to reverse population decline. Falling population numbers may have a negative impact on economic growth, although this may be offset by productivity improvements driven by technological developments. The country is yet to develop a comprehensive policy for supporting the transition of the ageing workforce, but is contemplating measures such as raising the retirement age and creating fiscal incentives to employ older workers.¹² Life expectancy has increased around the world and advances in healthcare may allow the productive life of individuals to be extended. Some individuals may need to remain in work for financial reasons as well as mental and physical well-being, but in order to retain older workers, transition programmes will be needed, allowing them the flexibility to undertake less strenuous employment or work that suits their experience and skills (which could be facilitated with technology for remote working). Thailand can look to China's Silver Age Action Initiative, which allows senior citizens to contribute as volunteers to the country's development.¹³ Countries like South Korea and Finland have job promotion programmes specifically for older people.¹⁴ Lifelong learning programmes will need to be available to populations of all ages in order for them to remain productive.¹⁵ This would also need to be accompanied by regulatory changes that promote the hiring of older workers and an increased awareness of how to create age-diverse work environments.

4. Critical uncertainties for Thailand

- In Thailand, community-based centres for the elderly have sprung up to meet the housing needs as the share of those aged above 65 increases from 7m to 17m over the next three decades.¹⁶ Ireland, which is also an ageing society, has launched a Smart Ageing Universal Design Challenge, which gives generous awards to entries that create products, services, solutions, and systems to improve the quality of life for older people¹⁷. How can Thailand incentivise private sector participation to meet the rising housing and other demands of the elderly?
- Thailand will be considered an aged society in 2024 – a transition happening over 22 years, while the same process took 115 years in France. Germany, another ageing society, provides incentives for older residents to work, and its "Initiative 50 plus" provides lifelong learning to older people and grants subsidies to those on lower salaries.¹⁸ What policies will Thailand adopt to create an employment market that is accessible to the elderly?
- As Thailand's population ages rapidly, the share of working-age population is likely to decline by 11% by 2040.¹⁹ In the US, people over the age of 50 represent a market worth US\$7.6trn a year (and growing).²⁰ How can Thailand turn its aged society into a source of opportunities?

BIOTECH

Biotech has a wide range of applications from food production to pharma and healthcare. Agriculture and biotechnology are likely to be the future growth engines for Thailand, and much depends on technological breakthroughs and advances in regulation.

1. Where we are

Thai society is ageing rapidly. Healthcare costs are growing to keep pace. About 12% of the Thai population is above 65 years old, rising to 14% in 2022. Healthcare spending constitutes roughly 3.9% of GDP, which amounts to US\$286 per person per year. Thailand had 0.4 doctors per 1,000 population in 2017, far below the OECD average of 3.4.²¹ The country exhibits a typical health profile of an upper-middle-income country, where non-communicable diseases such as cancers, cardiovascular diseases and respiratory diseases accounted for the majority of deaths in 2017.²² Cancer incidence and mortality rates are expected to remain high, and communicable diseases such as dengue fever and malaria continue to represent a significant challenge.²³ The public sector is the main contributor to healthcare expenditure, accounting for about 78% of total expenses. Thailand's Universal Health Coverage (UHC) takes up a majority of this spending, as the scheme provides free coverage for most medical services for 48m Thais (70% of the population). The country is an agricultural powerhouse: farming represents 10% of the country's GDP, employs roughly 30% of its population, and has helped it become one of the largest food exporters in the world.^{24 25 26} Due to its diverse natural resources, abundant farmland and thriving agriculture sector, Thailand has emerged as a research hub for biotechnology in the region.

2. What we know

The agriculture sector and biotechnology industry have been designated among the top ten future industries to drive Thailand's economic development as new growth engines.²⁷ The Thai government has been aggressively promoting growth and fostering developments in these sectors. It is looking to revitalise the Kitchen of the World campaign, a scheme to accelerate Thailand's plan to boost food exports to contribute more than 6% of the country's GDP,²⁸ expand food start-ups, and ramp up support for Thai restaurants overseas. In addition, the "Thailand 4.0" economic model offers generous incentives and tax exemptions to high-tech companies that set up advanced manufacturing facilities in the country – including agro-processing and food for the future. One of the key goals of the Thailand National Strategic Plan on Health (2017-36) is to reduce incidence rates and premature mortality relating to chronic diseases such as liver and lung cancer, and achieve an average life expectancy of at least 80 years. As of 2017, the independent Joint Commission International (JCI) had recognised

61 hospitals across Thailand. The country hopes to extend that certification even further in an effort to reach a greater percentage of the 1,300 private and government-funded hospitals in the country. According to BMI Research, total healthcare expenditure in Thailand amounted to US\$25.3bn in 2016, and is expected to increase to US\$47.9bn by 2026.²⁹ According to the International Healthcare Research Center, medical tourism is likely to grow by 14% annually.³⁰ This is due to several factors such as competitive prices for medical procedures and a high standard of medical treatment and services offered.

3. What we don't know

Demographic necessities and rapidly ageing societies are driving up healthcare bills across the globe, and the biotech sector is growing rapidly in response. Like any other emerging industry, there are uncertainties associated with the development of biotechnology. It remains to be seen what direction future research in biotechnology will take as discoveries and innovations are made constantly. Biotech is a high-risk industry, often experiencing boom-bust cycles due to high failure rates owing to strict regulation in clinical testing, given the repercussions for human health. Regulatory developments will impact the evolution of biotech, and how regulations adapt to these technology advancements in Thailand will play an important role in shaping the country's position in the region. The biotech industry in Europe and the US continues to face strategic and policy uncertainty with healthcare reform in the US and the departure of the UK from the EU. In contrast, the biotech market has been maturing in Asia, and particularly China. With the rise of ASEAN, while other countries, except Singapore, are still very behind, Thailand has the potential to be the biotech leader in the area by 2035.

4. Critical uncertainties for Thailand

- In 2017, employment in agriculture in Thailand was reported at 32.7%, though only represented 8.3% of GDP.^{31,32} The evidence shows that, in places where they are allowed, modern genetically modified (GM) crops are contributing to the growth of global agricultural productivity. In 2011, for instance, 16.7m farmers grew biotech crops on almost 400m acres in 29 countries, including 19 developing countries.³³ How can Thailand leverage biotech advances to increase the productivity of its agriculture sector?
- It will be important for Thailand to attract key talent to boost its biotech sector. China has seen a rapid rise in its nascent biomedicine capability in the past few years. Apart from regulatory reform and policy support, China has focused on bringing back to the country Chinese PhD workers from postgraduate research institutes and foreign companies.³⁴ In addition to its own nationals, which countries could Thailand target in its efforts to attract foreign research talent?

THAILAND 2035: HORIZON SCANNING OVERVIEW

AN ASSESSMENT OF CRITICAL FACTORS IMPACTING THAILAND'S DEVELOPMENT PROSPECTS TO 2035

- The biotech industry is booming with investment, growing rapidly around the world. In Switzerland, with its population of just over 8m, investment in biotech companies grew by an average of 28.1% per year in the last decade, doubling in just one year between 2016 and 2017.³⁵ Even without a national champion of its own, could Thailand become a global biotech hub through a combination of start-up acquisitions and investment from global incumbents?

CHANGING GEOPOLITICS

An increasingly assertive, powerful China will ensure that the 21st century looks vastly different from the 20th in Southeast Asia—but there is still a significant role to play for the incumbent powers, and enormous potential for ASEAN.

1. Where we are

China has grown to become the world's second largest economy, and is on track to surpass the US by around 2036. Its foreign policy is catching up with its growing economic footprint. The Belt and Road Initiative (BRI), a geostrategic effort to link China's supply chains from Southeast Asia to Europe, is a priority for Xi Jinping, the Chinese leader. The South China Sea has emerged as a source of potential interstate conflict as China has militarised artificial islands under its control in the hopes of making its territorial claim to the entire sea a reality. In the summer of 2017, Chinese and Indian forces engaged in a 73-day standoff on the disputed territory of the Doklam Plateau. The Xi administration's intended message is consistent through military parades and grandiose declarations of China's might: this current iteration is that China is a power to be feared and other nations must accept its will. Few audiences outside of China are enthusiastic about that message, and there is evidence of a coordinated response. The US is waging a trade war against China; while tariffs may be temporary, the decoupling of supply chains could set the stage for a new Cold War. Japan is in the process of complementing its longstanding economic diplomacy with a normalised military posture for the first time in the postwar era. India and Australia have regularly engaged the US and Japan on the concept of a "free and open Indo-Pacific" region. For its part, ASEAN members are demonstrating the bloc's role at the heart of the debate, through participation in both the Regional Comprehensive Economic Partnership (RCEP), which includes China, and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) which does not.

2. What we know

Mr Xi has consolidated authority to become the most powerful Chinese leader since Mao Zedong, and appears set to stay in power through the next decade. As the BRI is a personal priority, it will be a state priority throughout his tenure. China's share of trade and investment in BRI markets should continue to grow in the period to 2035, at the expense of Japan, Europe, and the US. Growing economic interdependence will lead to greater political integration. Despite concerns of debt-trap diplomacy, Cambodia has wholeheartedly embraced its role in the BRI, with reports of a secret deal entitling China to station military personnel at Ream Naval Base.³⁶ Other examples of Chinese expansion include Sri Lanka's Hambantota Port and Djibouti's Doraleh Multipurpose Port.^{37 38} These

projects should continue in the period to 2035, particularly in less developed, authoritarian countries in South and Southeast Asia, Central Asia, the Middle East, and East Africa. Thailand has enjoyed a long partnership with the US, and warmer ties suggest a continuation of that partnership through the period to 2035. Broad support in the US for a more hawkish China policy will ensure the US remains engaged in geostrategic competition in Southeast Asia in the period to 2035.

3. What we don't know

A major question surrounds China's intentions with its new geostrategic networks. Some analysts feel the threat is exaggerated and that China's engagement with the rest of the world in the next 15 years will largely resemble that of the past 15 years, focusing on expanding market access for its increasingly global firms. Others point to signs of China's willingness to expand its values and governance model beyond its borders, using the BRI architecture to intimidate smaller countries on any issue deemed sensitive by the Chinese state. It is a wide spectrum of outcomes, and one that is likely applied asymmetrically depending on factors including proximity, trade and investment, market size, and relations with democratic powers. Other than proximity, these factors can vary significantly in the period to 2035. The Chinese economy could collapse, dramatically reversing the trend of growing Chinese outbound investment. ASEAN's collective economy would be the third largest in Asia behind China and India. Further political integration could give its members considerably more economic weight – and with it, greater capacity for resisting China's demands. Finally, the security posture of the US is uncertain in the next two years – let alone the next 15 – given the divergent foreign policies of Mr Trump and his main rivals in the 2020 presidential election. Japan, too, is in the midst of an epic public debate over national identity and the role of its military, one that could be resolved in a number of ways in the period to 2035.

4. Critical uncertainties for Thailand

- China's growing role in international standards-setting bodies threatens the primacy of US-led institutions set up in the aftermath of World War II. China is leveraging its firms and diplomatic corps to shape global standards for emergent technology – such as 5G, artificial intelligence, and cybersecurity – in support of its national economic and political priorities. What would be the risks and rewards of Thailand's acquiescence to Chinese leadership in international technology standards in the period to 2035?
- The average ASEAN consumer buys nearly 1.75 times as many US goods than the average Chinese consumer, while US-ASEAN trade is up 62% since 2002.³⁹ However, China is moving up the value chain, with initiatives to promote national brands in sectors such as manufacturing, technology, transportation, materials science, and biotechnology.⁴⁰ For its part, Japan remains the largest infrastructure investor in Southeast Asia, with US\$367bn worth of outstanding projects in the region's six largest economies⁴¹, compared to

THAILAND 2035: HORIZON SCANNING OVERVIEW

AN ASSESSMENT OF CRITICAL FACTORS IMPACTING THAILAND'S DEVELOPMENT PROSPECTS TO 2035

US\$255bn worth of Chinese projects.⁴² If ASEAN countries are forced to choose between China and Japan and the US, what sectors will be most affected in 2035?

- Faster integration for the ASEAN bloc could turn it into a great power in its own right. By 2035, its economy could exceed that of Japan and Australia combined, while political integration could provide for coordinated military command among regional powers, particularly Thailand, Vietnam, Indonesia, and Singapore. What would be the political and economic implications for Asia if ASEAN was a great power in its own right?

DISASTER RISK

With rising sea levels and increasing temperatures, the next 15 years will present increasing threats for low-lying coastal regions across the world. Thailand is one of the most vulnerable countries to disaster risk.

1. Where we are

Today, 59% of cities with at least 500,000 inhabitants are highly exposed to one or more of six types of natural disaster: cyclones, floods, droughts, earthquakes, landslides and volcanic eruptions⁴³. In 2018, 45% of 315 global natural disaster events occurred in Asia, including eight out of the deadliest ten.⁴⁴ Thailand is particularly vulnerable. In the Global Climate Risk Index 2019, it was ranked 10th (of 180 countries) for suffering the greatest impact from weather-related conditions. Bangkok is sinking by 0.8 inches every year.⁴⁵ The “great flood of 2011” affected 66 of Bangkok’s 77 provinces, causing over 1,000 deaths and US\$45-50bn in damage.⁴⁶

2. What we know

More than 10% of Thais live on land that is likely to be inundated by 2050.⁴⁷ Thailand has long coastlines, a fragile agriculture system and is susceptible to extreme weather events such as tropical storms, floods and drought. Forest areas declined from 27.36m hectares in 1961 to 17.2m hectares in 2009.⁴⁸ In Bangkok, economic growth has undermined climate resilience. Land subsidence, driven by excessive groundwater extraction, has become a key challenge. This is made worse by the city’s highly compressible soil, known as “Bangkok clay”. Rapid urbanisation has also eroded natural areas of water retention and floodplains that are key in preventing flood damage.⁴⁹ Fast-changing demographics have increased the urgency for disaster-risk-preparedness. Thailand will become an aged society by 2021, and a super-aged society by 2050, when 35% of the population will be aged 60 and above.⁵⁰ The elderly are more likely to suffer adverse physical consequences of disasters as they are more vulnerable before disasters and less able to seek assistance afterwards.⁵¹ Accounting for the needs of the elderly during disasters will play a critical role in making this group resilient.

3. What we don’t know

There is sufficient global evidence to show that climate change is happening, but the speed and severity of impact remains unclear. The uncertainty of future climate policies, greenhouse gas emissions, complex socioeconomic feedback loops, and unknown tipping points complicate projections. If left unchecked, climate change could reduce Southeast Asia’s GDP by 11%, and rice yields in Thailand could be diminished by as much as 50% from 1990 levels by the end of the century.⁵² Thailand’s vulnerability to climate change will depend on the nature and rate of urbanisation. This

will further depend on economic and political factors which are hard to predict. Economic factors such as employment opportunities, infrastructure and public services could have a strong impact. Thailand's fast growth has remained largely limited to Bangkok; the city's population increased from 5.4m in 1986 to 9.6m in 2010, and is projected to reach 11m in 2030, making urban resilience and climate mitigation efforts increasingly critical.^{53 54 55} Despite efforts to address climate change, gaps still remain in the country. Some of the government's efforts remain uncertain, such as the National Catastrophe Fund, set up in 2011 but scrapped in 2015-16. The impact of new technologies is also unknown. For example, there is a promising 11-acre park in Chulalongkorn University that can hold up to 1m gallons of rainwater. These types of solutions, if successful, will play a crucial role in preparing the city for potential disasters in the future.

4. Critical uncertainties for Thailand

- Fast urbanisation and a lack of available land will be among Bangkok's biggest challenges to growing the city's green space. Green space can help to counter local emissions (through natural sequestration), reduce local temperatures, and improve resilience to extreme weather events.⁵⁶ Future cities are likely to have wind and solar farming in the metropolitan area, vertical greening of infrastructure, and sky parks for citizens. How can Bangkok leverage the private sector today through zoning laws, tax credits and investment policy to develop a leading green megacity in 2035?
- Tourism can be categorised as Thailand's largest export industry. In 2011, extensive coral bleaching shut down 18 dive sites, driving thousands of tourists away. How can Thailand adapt its tourism sector to prepare for a future in which environmental tourism is no longer a growth industry?
- The remedies to climate change vary significantly from rural to urban areas, due to different levels of development and economies of scale. The EIU forecasts Bangkok's share of the national population at over 22% in 2030. In what ways are climate mitigation efforts in Bangkok more expensive compared with elsewhere in the country? In what ways are such efforts more cost-effective?

FOURTH INDUSTRIAL REVOLUTION AND 21ST-CENTURY SKILLS

With an economy reliant on manufacturing, Thailand is highly exposed to disruption from technological advances in production processes. To reap the benefits from the Fourth Industrial Revolution, it will need to invest decisively in its infrastructure and human capital.

1. Where we are

The Fourth Industrial Revolution (4IR) refers to the disruptive forces from technologies such as artificial intelligence (AI), robotics, the internet-of-things and big data.⁵⁷ Thailand's manufacturing sector accounts for 35% of GDP, agriculture for 8%, and services for 56%; 31% of workers are employed in agriculture, 23% in manufacturing and 45% in services. The informal sector is also sizeable: 51% of total non-agricultural workers are employed in the informal economy.⁵⁸ Another concern is that Thailand faces stiff competition as a regional hub for innovation just as 4IR is accelerating. The operating environment for technology start-ups remains challenging relative to Singapore, Hong Kong, or Malaysia. In the EIU's Business Environment Ratings, Thailand lags all three competitors in terms of the quality of its labour market, infrastructure, tax regime and access to finance. Thailand ranks 56th out of 194 countries on AI readiness.⁵⁹ A recent partnership between the Digital Council of Thailand (DCT) and the Federation of Thai Industries (FTI) aims to develop Thailand as a digital innovation hub, with a plan for workforce reskilling and upskilling.⁶⁰ Thailand ranks 73rd out of 141 countries on skills quality for the current and future workforce. In comparison, Singapore ranks 19th and Malaysia ranks 30th.⁶¹

2. What we know

Emergent technologies will displace some types of employment in the period to 2035. The EIU evaluates displacement in terms of tasks; only jobs that consist entirely of tasks that are easily automated will be eliminated. That makes for disparate impacts across the economy and within sectors. For example, a transit operator with the sole responsibility of driving a train is probably at greater risk of seeing their job eliminated than a conductor for Bangkok Metropolitan Rapid Transit who can also serve as a station manager, customer service agent and security guard. The latter tasks require the blend of soft skills that are not at risk of automation in the period to 2035, such as management, empathy, and communication. The positive lesson for policymakers is that the scale and intensity of the disruption in 2035 can be managed through education over the next 15 years. Many studies demonstrate the clear link between 21st-century skills and resilience in the labour force to technological disruption. The innovators of 2035 – people, companies, cities and countries – will have developed these skills in the preceding decade. The direction of causality will not change.

3. What we don't know

We don't know what new tasks will be created in the next ten years, or how specific jobs will evolve to better complement new technologies. The speed of technological disruption will vary significantly across jobs, sectors, and economies. Governments can implement a wide range of skills policy in the next few years to alter their trajectories. In December 2017, The EIU published "Risks and Rewards: scenarios around the economic impact of machine learning", an exploration of scenario-based forecasts for machine learning in 2030.⁶² A mix of proactive policy, such as investment in human capital, access to open source data, and tax credits to spur private sector adoption of machine learning and develop greater computing efficiency could boost GDP growth by over 2% annually relative to the baseline in the next decade, with the greatest gains accruing to developing economies.⁶³ However, a failure to improve human capital beyond 2016 levels, as well as shortcomings in open data and tax policy, could yield negative growth in some economies relative to today's GDP. That range of outcomes highlights the frenetic nature of 4IR disruption – and the steep costs of inaction. The most dire estimates of potential job losses due to automation include 47% for the US,⁶⁴ 77% for China, and 69% for India.⁶⁵

4. Critical uncertainties for Thailand

- 4IR has the potential to eliminate jobs on a wide scale, particularly those comprising largely routine tasks. According to a report from the International Labor Organization, Thailand's subsistence crop farmers, shop sales attendants, and food service counter attendants are among the most vulnerable workers.⁶⁶ Manufacturing is also a strategically important sector for Thailand, but industrial automation could preclude employment growth even as output accelerates. How can Thai policymakers ensure that growth in the service sector can offset disruption in manufacturing employment, while also helping to move the economy up the value chain?
- On the national scale, the best remedy for 4IR disruption is education, particularly in skills that complement machine learning and big data. Skills such as critical thinking, creativity and entrepreneurship, communication and leadership are difficult to replicate with computers. They represent job security in ways that are more realistic than teaching an entire generation how to code. How does Thailand need to position its education system to teach skills that complement the emergent technologies that constitute 4IR?
- Thailand currently lags regional competitors in terms of entrepreneurship and innovation, in part because of the superior infrastructure in those markets. The EIU rates Thailand's infrastructure as the 11th best of Asia's top 16 economies, behind China and ahead of India. Two factors are pushing the boundaries of infrastructure development: automation

THAILAND 2035: HORIZON SCANNING OVERVIEW

AN ASSESSMENT OF CRITICAL FACTORS IMPACTING THAILAND'S DEVELOPMENT PROSPECTS TO 2035

in transportation and 5G mobile telecommunications. By 2035, could Thailand leapfrog regional rivals in the competition to attract business headquarters by developing the region's most automated transportation network and fastest information network?

INEQUALITY

Thailand has moved from a low-income to upper middle-income country in the span of four decades. In spite of significant progress in poverty reduction, inequality persists and poses a challenge for long-term development and stability.

1. Where we are

Thailand's economy grew from low-income to upper-middle income in the span of four decades. In this process, significant poverty reduction has been achieved. In 2000 almost 50% of the population was earning \$5.50 (2011 PPP) a day, and in 2015 this ratio had been reduced to 7.1%.⁶⁷ The World Bank has also recognised Thailand's macroeconomic management, strong fiscal stance and low public debt and inflation⁶⁸. A diverse manufacturing economy has offered economic opportunity to many and unemployment is very low. The Gini coefficient, one of the most widely-used statistical measures of inequality, shows an improvement over the past 20 years, with some stalling recently however. It stood at 36.5 in 2017, below Indonesia, China and Malaysia. However, inequality persists. Using a different methodology, in fact, a study suggests that inequality in Thailand is one of the starkest in the world, with 1% of the population owning more than two thirds of the country's wealth.⁶⁹ These results have been however disputed locally.⁷⁰ Inequality in the country can also be expressed in geographical terms. Regional inequalities are high: the richest provinces have more than six times the average income of the poorest provinces. Bangkok accounts for 30% of national GDP, with only 15% of the country's total population. Urban-rural disparities also exist, with more than half of rural households found in the bottom 40 percent of the income distribution (vs. a quarter of urban households).⁷¹

2. What we know

As in many regions of the world, inequality is becoming a crucial topic in the public agenda. Recent studies suggest that inequality may hinder economic growth for the aggregate of the economy. Inequality may also exacerbate social tensions, political instability and can fuel crime.⁷² Experts suggest measures that can help bridge inequality, such as progressive taxation, do not necessarily need to curtail economic growth, if done properly.⁷³ Measures directed at creating equal opportunities for the people to contribute to the economy, such as universal quality education and healthcare, can be effective. The US Congressional Budget Office forecasts continued growth of income inequality through 2035, in line with trends over the past 40 years.⁷⁴ In the past, greater inequality was correlated with advances in computing technology that failed to accrue evenly throughout society. Emergent technologies like artificial intelligence, big data and the internet of things will have the same effect in the absence of better skills or redistributive policies.

3. What we don't know

Despite technological evolution's role in driving inequality in past years,⁷⁵ this does not need to be the case going forward. Technological change may displace some workers though tends to create far more jobs than are destroyed.⁷⁶ A wide range of outcomes depends on policy. If publics demand action, governments can draw on a number of tools to fight inequality, such as redistributive taxation, social spending (particularly on education), and infrastructure development. Some countries will be better placed than others to invest in education that complements technological advances. Changing tax structures could represent a more cost-effective solution. Regardless, while the trend of greater inequality seems fairly predictable, the path to 2035 features a range of possibilities, from successful, prescriptive policy remedies to a continuation of the status quo to societal collapse and revolution.

4. Critical uncertainties

- Universal basic income (UBI) has been proposed as a possible remedy to technological change's association with inequality. A 2017-18 experiment with UBI in Finland found that people were happier, even if there was little impact on inequality.⁷⁷ Should the Thai government's inequality priority be reducing inequality or increasing happiness?
- In 2006, India launched the Mahatma Gandhi National Rural Employment Guarantee Scheme where every adult in a rural area had the right to demand work (up to 100 days) from the state government. The scheme successfully raised rural wages and reduced unemployment. Would similar schemes empower rural households in Thailand?
- Inequality is not only limited to wealth. Bangkok's elite schools are on par with peers globally, but the average student is unlikely to be able to access them due to distance or financial constraints.⁷⁸ How might the government leverage the success of its best schools to develop a national education framework that eliminates variation in education quality based on location or socioeconomic status?
- Redistributive taxation, social spending, and infrastructure development can be costly remedies for inequality. In 2017, Thailand's tax share of GDP was 14.8%, just above Singapore and Philippines (both at 14.2%). Will government budgets be prepared to tackle inequality in the period to 2035 without raising taxes that could make Thailand a less attractive regional business hub?

MIGRATION

As Thailand moves up in the value chain, from a manufacturing to a knowledge economy, it may experience complex migration flows. Government action will be needed to timely regulate human mobility, so that it can adequately support the country's development objectives.

1. Where we are

Through years of economic growth and low unemployment, Thailand has attracted many workers from neighbouring countries. About 4.9 million non-nationals, including 3.9 million workers from Cambodia, Laos, Myanmar and Vietnam reside in the country. Migrant workers constitute over 10% of the labour force and many find themselves in an irregular legal situation.⁷⁹ While emigration is lower than immigration, it is still significant, and approximately 1.2m Thais reside abroad.⁸⁰ Key destinations include Taiwan, Israel, Japan, South Korea, Malaysia and Singapore. The country is both importing and exporting low-skilled workers, a sign of a certain segmentation within its labour market.⁸¹ There is also significant internal migration, especially between rural and urban settings. About 9.4% of the population has reported to have migrated internally in the past five years.⁸² Internal migration is known to be driven by economic disparities within the country and seasonal dynamics. Over the years, the country has developed a dependency on foreign low-skilled labour, which is affecting its productivity and competitiveness.⁸³ It is important for the country to continue its efforts to move up in the value chain, as it may not always be able to rely on low labour costs to remain competitive.

2. What we know

Migration may be increasingly necessary given the demographic structure of Thailand. Thailand's population is ageing rapidly, and it is estimated that by 2035 about 30% will be over 60 years old.⁸⁴ At the same time, fertility has dropped in the past five decades and it is now at 1.58, well below the 2.1 replacement rate.⁸⁵ These trends will contribute to a shrinking labour force. The National Economic and Social Development Council projects that Thailand's workforce (aged 15-59 years) will fall by about 6m between 2015 and 2035. Unless there is a substantial change in the country's productive structure (for example, through rapid technological advancement) sustaining economic growth will require a continuous inflow of foreign workers.⁸⁶ The EIU forecasts economic growth in Thailand to average 2.56% annually between 2019 and 2035. In the coming five years, segments that will contribute to growth are: exports, tourism, manufacturing, as well as infrastructure projects. Meanwhile, Thailand's main sources of foreign labour are expected to grow faster. In the period to 2024, we forecast average annual GDP growth in Cambodia at 6.4%; Laos at 6.7%;⁸⁷ and Myanmar at

6.7%. Vietnam, the most populous country in the region, will grow at an average rate of 5.1% per year in the period to 2035. Robust growth may help those countries retain workers that otherwise would seek opportunities abroad. Policy changes and growth considerations will support the appeal of other regional destinations for Thai expatriate workers. Japan, for example, has relaxed immigration rules for certain types of migrants, a new trend that looks set to continue over the forecast period.⁸⁸ Malaysia is expected to grow at 4.05% to 2035—strong growth for an upper middle-income economy

3. What we don't know

Although the EIU expects Thailand to grow in the coming years, unknown economic shocks could affect the direction of migration flows. If the local economy underperforms, a higher number of local workers could seek opportunities abroad. The economic crisis of the late 1990s spurred emigration to other countries in the region.⁸⁹ Thai immigration policy could deliberately attract immigrants from other low-income Asian countries. Sustained growth in other ageing regional economies, such as Malaysia, Japan, South Korea or Taiwan, could create further competition for foreign labour—but much depends on the politics of demographics and immigration in those countries, which can be unpredictable. Changes in attitudes towards immigration in rich countries could also play in the dynamics of emigration from Thailand. Climate change is a wildcard, too. Thailand is one of the countries with the greatest exposure to climate risk in the world.⁹⁰ Finally, the politics of immigration and skills are an unknown in the period to 2035. There could be heightened demand for highly-skilled labourers from all over the world. Conversely, disruptions in traditional industries may create unemployment among the low-skilled, who may try to find opportunities abroad.

4. Critical uncertainties for Thailand

- ASEAN has enabled greater regional integration, but so far the effect on mobility have been limited.⁹¹ In Europe, the Schengen Zone, permitting the free movement of people among members, helped to drive intra-EU migration by 28% between 1960 and 2015.⁹² What kind of regional measures could Thailand push for at ASEAN to better meet the human capital needs of its economy?
- There is an inherent lack of data on irregular migration, making it difficult to set evidence-based policy, forecast economic growth, and provide appropriate health and education services to migrants. Based on decades of research, Pew Research Center developed a method for measuring irregular migrants in the US.⁹³ What kinds of data series could the Thai government invest in to help drive immigration policy decisions in the period to 2035?
- Asia is on the verge of a collective demographics crisis, with ageing societies in economies as diverse as Japan, China and Vietnam. However, with crisis comes opportunity. Difficult demographics were able to completely change the public discourse in Japan on migration,

THAILAND 2035: HORIZON SCANNING OVERVIEW

AN ASSESSMENT OF CRITICAL FACTORS IMPACTING THAILAND'S DEVELOPMENT PROSPECTS TO 2035

despite cultural opposition and a history largely defined by a closed door immigration policy.

⁹⁴ How could public awareness of ageing provide political space for the government to take on a more ambitious immigration policy?

TECHNOLOGY AND POLITICS

Technology and social media can strengthen democracies, but also risk dividing and harming communities. Recent global events underline the importance for Thailand of strengthening data privacy frameworks, developing digital literacy skills and building citizen trust in the data economy.

1. Where we are

The increasing use of digital technologies and social media in Southeast Asia is transforming how people live and work. In ASEAN, 125,000 new users come online every day.⁹⁵ In Thailand, the number of internet users has tripled since 2010. According to the Global Web Index, based on a 2018 survey of internet users in 40 countries, Thai people spent the most time on the internet per day (9h 38m).⁹⁶ On the other hand, Thailand remains home to one of the world's largest offline populations of 39.1m people.⁹⁷ As internet access spreads rapidly in Southeast Asia, so too does social media use. As of 2018, social media penetration in Southeast Asia was estimated at 46%, a 31% increase over 2017.⁹⁸ Thailand ranks in the world's top ten in social media use: in 2018, there were 49m Facebook users and 13.6m Instagram users.⁹⁹ The government is also taking action against online misinformation, unveiling an anti-fake news centre in 2019.¹⁰⁰

2. What we know

As social media further expands into the economy and society, governments will likely play a more active role in governing it. In democratic societies, the free flow of information tends to lead to the inclusion of more people in the political debate and acts as a primary tool to empower citizens. However, the lack of information scrutiny that currently characterises social media platforms – and the reinforcement of existing opinions among users through content prioritisation algorithms – will increase the risk of coordinated misinformation being circulated online. Cybersecurity will be a growing concern for regulators, businesses and individuals as more of society becomes digital. The emerging trend of government regulation of social media platforms and online content should accelerate in the period to 2035. A 2019 global survey on internet security and trust found that more than half of internet users were more concerned about their privacy than they were one year previously.¹⁰¹ Internet privacy, trust and safety will be more obvious concerns to the vast majority of users by 2035 as companies and governments continue to mine personal data. Thailand's cybersecurity spending is projected to grow to US\$511m by 2025 from US\$159m in 2015,¹⁰² adding 1,000 cybersecurity specialists within the next few years.¹⁰³

3. What we don't know

There is uncertainty about how social media tools will be leveraged in the future. In the period to 2035, it is unclear how false and misleading narratives will impact the political climate of countries. Regulation could slow or stop the spread of misinformation, although it is not clear what form technology regulation will take in 2035. Some governments are calling for social media companies to be accountable for what appears on their platforms; to be more transparent; and to be treated as monopolies that need breaking up. Others suggest requiring technology firms to change their business model, making their money directly from users rather than advertisers. Advances in artificial intelligence (AI)-based surveillance technology enable unprecedented government control over citizens. According to a recent CNBC report, China has rolled out 200m cameras nationwide, backed by machine learning and facial recognition technology. China's two biggest AI companies specialise in surveillance.¹⁰⁴ Furthermore, the dual nature of emergent technology – civilian or policing actions on the one hand, and political oppression on the other – makes for a wide range of applications in the future. It presents a particular challenge for democracies whose social order rests on sovereignty and the consent of citizens.

4. Critical uncertainties for Thailand

- Misinformation is most harmful when consumers of media are not capable of critically assessing content. Finland, which tops the list of European countries most resilient to misinformation, has launched a project, "Facts, please", which has enabled 124 journalists across the country to teach media literacy to 7,200 school students.¹⁰⁵ Can similar digital literacy initiatives enable Thailand to fight misinformation?
- As technology's impact on daily life continues to grow, trust in technology will become increasingly political. The Bangkok police force has joined the private sector to pilot a public surveillance system powered by AI.¹⁰⁶ A rather controversial application of AI, predictive policing, could enable the prediction of criminal activity. Several countries have tested the technology, including China, India, the Netherlands, the US and Japan.¹⁰⁷ How will Thailand balance the law-and-order benefits of emerging technology while preserving public trust?
- Advanced technologies like AI and blockchain could become mainstream in elections in the future, eliminating fraud and increasing public faith in the results. Thailand's National Electronics and Computer Technology Center (NECTEC), a unit of the Ministry of Science and Technology, has already completed the development of the system for blockchain-based voting and is looking for trial partners.¹⁰⁸ How can the government scale up the application of these technologies so that they are an inherent part of the political process by 2035?

THAILAND 2035: HORIZON SCANNING OVERVIEW

AN ASSESSMENT OF CRITICAL FACTORS IMPACTING THAILAND'S DEVELOPMENT PROSPECTS TO 2035

Notes

- 1 <https://www.bloomberg.com/graphics/2019-thailand-baby-bust/>
- 2 <https://population.un.org/wpp/DataQuery/>
- 3 <https://www.ncbi.nlm.nih.gov/pubmed/12264058>
- 4 <http://documents.worldbank.org/curated/en/857101468174236152/Main-report>
- 5 <https://population.un.org/wup/DataQuery/>
- 6 <https://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS?locations=TH>
- 7 <https://population.un.org/wpp/DataQuery/>
- 8 <https://www.thelancet.com/action/showFullTableHTML?isHtml=true&tableId=tbl1&pii=S0140-6736%2817%2930873-5>
- 9 <http://www.eiu.com/graphics/marketing/pdf/fertility-in-south-east-asia-final.pdf>
- 10 http://www.searo.who.int/entity/maternal_reproductive_health/documents/tha-fp.pdf?ua=1
- 11 <http://www.eiu.com/graphics/marketing/pdf/fertility-in-south-east-asia-final.pdf>
- 12 <https://www.scmp.com/news/asia/southeast-asia/article/1986288/going-grey-thailands-ageing-population-straining-system>
- 13 <https://arc.aarpinternational.org/countries/china>
- 14 <https://www.theguardian.com/society/2017/nov/13/uk-and-us-must-learn-from-poor-countries-to-solve-ageing-crisis>
- 15 <https://www.weforum.org/agenda/2018/05/making-the-most-of-asia-s-aging-populations>
- 16 <https://www.scmp.com/news/asia/southeast-asia/article/1986288/going-grey-thailands-ageing-population-straining-system>
- 17 <https://rebuildingireland.ie/news/smart-ageing-universal-design-challenge/>
- 18 <https://www.forbes.com/sites/nextavenue/2018/05/10/how-these-3-countries-embrace-older-workers/#27b2e1371bd4>
- 19 <http://www.eiu.com/graphics/marketing/pdf/fertility-in-south-east-asia-final.pdf>
- 20 <https://www.weforum.org/agenda/2019/01/an-aging-workforce-isnt-a-burden-its-an-opportunity/>
- 21 The Economist Intelligence Unit
- 22 <http://ghdx.healthdata.org/gbd-results-tool>
- 23 In 2018, over 59,000 confirmed cases of dengue and 69 associated deaths were recorded. In 2016, it is estimated that around 440,000 people were infected with HIV, with around 14,000 AIDS-related deaths a year, according to the Joint UN Programme on HIV/AIDS. There are also 117,000 cases of tuberculosis each year.
- 24 https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?year_high_desc=true
- 25 <https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS>
- 26 <https://qz.com/1347428/how-thailand-is-transforming-itself-from-a-leading-food-exporter-to-a-bioeconomy-giant/>
- 27 http://www.bo.go.th/upload/content/TIR_Feb17_vF_93086.pdf
- 28 <https://www.bangkokpost.com/business/1475441/kitchen-of-the-world-gets-reboot>
- 29 <https://www.netherlandsworldwide.nl/binaries/en-nederlandwereldwijd/documents/publications/2018/04/18/factsheet-life-sciences-health-in-thailand/Thailand+-+Factsheet+Life+Sciences+%26+Health.pdf>
- 30 <https://assets.kpmg/content/dam/kpmg/th/pdf/2018/03/th-medical-tourism-industry-focus-secured.pdf>
- 31 <https://tradingeconomics.com/thailand/employment-in-agriculture-percent-of-total-employment-wb-data.html>
- 32 <https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?locations=TH>
- 33 <https://www.weforum.org/agenda/2013/02/how-could-biotechnology-improve-your-life/>
- 34 <https://www.ubs.com/global/en/wealth-management/chief-investment-office/market-insights/regional-outlook/2018/china-biotech.html>
- 35 <https://www.swissbiotech.org/wp-content/uploads/2019/05/Swiss-biotech-report-2019-1.pdf>
- 36 <https://www.wsj.com/articles/secret-deal-for-chinese-naval-outpost-in-cambodia-raises-u-s-fears-of-beijings-ambitions-11563732482>
- 37 <https://www.nytimes.com/2018/06/25/world/asia/china-sri-lanka-port.html>
- 38 <https://www.washingtonpost.com/national-security/2018/12/14/could-china-squeeze-us-out-its-only-permanent-military-base-africa/>
- 39 <https://www.usasean.org/regions/asean/about>
- 40 <https://fas.org/sgp/crs/row/IF10964.pdf>
- 41 Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam.
- 42 <https://www.bloomberg.com/news/articles/2019-06-23/china-no-match-for-japan-in-southeast-asia-infrastructure-race>
- 43 https://www.un.org/en/events/citiesday/assets/pdf/the_worlds_cities_in_2018_data_booklet.pdf
- 44 <https://reliefweb.int/report/world/impact-and-causes-disasters-and-migration-southeast-asia>
- 45 <https://www.ft.com/content/bed1cb22-c28d-11e9-a8e9-296ca66511c9>
- 46 <https://www.preventionweb.net/news/view/65887>
- 47 https://coastal.climatecentral.org/map/9/100.8958/13.6789/?theme=sea_level_rise&map_type=coastal_dem_comparison&elevation_model=coastal_dem&forecast
- 48 <http://documents.worldbank.org/curated/en/770551542942024490/pdf/125234-REPLACEMENT-PUBLIC-TH-WBG-Framework-ENG-FINAL-Mar-11.pdf>
- 49 <http://www.oecd.org/cfe/Building-Resilient-Cities-Flyer.pdf>
- 50 tps://www.un.org/en/development/desa/population/events/pdf/expert/29/session3/EGM_25Feb2019_S3_VipanPrachuabmoh.pdf
- 51 <https://www.wmplc.org/ojs/index.php/ajdm/article/view/1882>
- 52 <https://www.adb.org/sites/default/files/publication/178615/sea-economics-global-climate-stabilization.pdf>
- 53 https://www.100resilientcities.org/wp-content/uploads/2017/07/Bangkok_-_Resilience_Strategy.pdf
- 54 <https://www.channelnewsasia.com/news/asia/asia-s-future-cities-urban-renewal-to-revive-bangkok-for-its-250-7620376>
- 55 <https://www.worldbank.org/en/news/feature/2015/01/26/urbanization-in-thailand-is-dominated-by-the-bangkok-urban-area>
- 56 <http://www.opengreenspace.com/opportunities-and-challenges/climate-change/>
- 57 http://www3.weforum.org/docs/WEF_2017_ASEAN%204IR.pdf
- 58 <https://data.worldbank.org/indicator/SL.ISV.IFRM.ZS>
- 59 <https://www.oxfordinsights.com/ai-readiness2019>
- 60 <https://www.opengovasia.com/dct-and-fti-to-collaborate-on-development-of-ai-in-thailand/>
- 61 http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf
- 62 <https://eiperspectives.economist.com/technology-innovation/risks-and-rewards-scenarios-around-economic-impact-machine-learning>

THAILAND 2035: HORIZON SCANNING OVERVIEW

AN ASSESSMENT OF CRITICAL FACTORS IMPACTING THAILAND'S DEVELOPMENT PROSPECTS TO 2035

- 63 https://perspectives.eiu.com/sites/default/files/Risks_and_rewards_2018.2.7.pdf
- 64 https://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf
- 65 https://www.oxfordmartin.ox.ac.uk/downloads/reports/Citi_GPS_Technology_Work_2.pdf
- 66 https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---act_emp/documents/publication/wcms_579675.pdf
- 67 <https://databank.worldbank.org/reports.aspx?source=2&Topic=11>
- 68 <https://www.worldbank.org/en/news/press-release/2011/08/02/thailand-now-upper-middle-income-economy>
- 69 <https://www.aseantoday.com/2019/01/thailands-wealth-inequality-is-the-highest-in-the-world-what-does-this-mean-for-upcoming-elections/>
- 70 <https://www.bangkokpost.com/thailand/general/1589886/nesdb-denies-nation-worst-for-inequality>
- 71 <http://documents.worldbank.org/curated/en/154541547736805518/pdf/Thailand-Economic-Monitor-Inequality-Opportunity-and-Human-Capital.pdf>
- 72 <https://www.washingtonpost.com/news/wonk/wp/2018/02/06/how-rising-inequality-hurts-everyone-even-the-rich/>
- 73 <https://www.economist.com/finance-and-economics/2017/10/19/higher-taxes-can-lower-inequality-without-denting-economic-growth>
- 74 <https://www.demos.org/blog/rise-inequality-projected-continue-until-2035>
- 75 http://www.oecd.org/els/emp/EMO%202012%20Eng_Chapter%203.pdf
- 76 <https://www.bbc.co.uk/news/business-45545228>
- 77 http://julkaisut.valtionuuvosto.fi/bitstream/handle/10024/161361/Report_The%20Basic%20Income%20Experiment%2020172018%20in%20Finland.pdf
- 78 <https://govinsider.asia/digital-gov/exclusive-thailand-education-inequality-teerakiat-jareonsettasin/>
- 79 https://thailand.iom.int/sites/default/files/document/publications/Thailand%20Report%202019_22012019_LowRes.pdf
- 80 Ibid.
- 81 <http://journals.giga-hamburg.de/index.php/jsaa/article/download/1123/735>
- 82 https://thailand.iom.int/sites/default/files/document/publications/Thailand%20Report%202019_22012019_LowRes.pdf
- 83 https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---sro-bangkok/documents/publication/wcms_145130.pdf
- 84 <https://population.un.org/wpp/DataQuery/>
- 85 <http://www.eiu.com/graphics/marketing/pdf/fertility-in-south-east-asia-final.pdf>
- 86 https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---sro-bangkok/documents/publication/wcms_145130.pdf
- 87 https://www.imf.org/external/datamapper/NGDP_RPCH@WEO/OEMDC/ADVEC/WEOORLD
- 88 <https://www.bbc.co.uk/news/world-asia-46492216>
- 89 <https://journals.sagepub.com/doi/abs/10.1177/011719689800700209?journalCode=amja>
- 90 https://germanwatch.org/sites/germanwatch.org/files/Global%20Climate%20Risk%20Index%202019_2.pdf
- 91 https://thailand.iom.int/sites/default/files/document/publications/Thailand%20Report%202019_22012019_LowRes.pdf
- 92 <https://voxeu.org/article/impact-eu-s-free-movement-people-principle-migration>
- 93 <https://www.pewresearch.org/fact-tank/2019/07/12/how-pew-research-center-counts-unauthorized-immigrants-in-us/>
- 94 <https://www.nytimes.com/2018/12/07/world/asia/japan-parliament-foreign-workers.html>
- 95 <https://www.weforum.org/projects/digital-asean>
- 96 <https://wearesocial.com/blog/2018/01/global-digital-report-2018>
- 97 <https://theinclusiveinternet.eiu.com/assets/external/downloads/3i-bridging-digital-divides.pdf>
- 98 <https://www.oecd.org/going-digital/southeast-asia-connecting-SMEs.pdf>
- 99 <https://www.bangkokpost.com/business/1420086/thailand-makes-top-10-in-social-media-use>
- 100 <https://www.reuters.com/article/us-thailand-fakenews/thailand-unveils-anti-fake-news-center-to-police-the-internet-idUSKBN1XB480>
- 101 <https://www.cigionline.org/internet-survey-2019>
- 102 <https://www.bangkokpost.com/thailand/politics/1562230/the-cybersecurity-balancing-act>
- 103 <https://e27.co/thailands-great-cybersecurity-push-20181129/>
- 104 <https://www.cnn.com/2019/05/16/this-chinese-facial-recognition-start-up-can-id-a-person-in-seconds.html>
- 105 <https://ipi.media/new-finnish-project-brings-journalists-to-schools-to-teach-media-literacy/>
- 106 <https://www.bangkokpost.com/thailand/general/1461737/traffic-cops-launch-new-hi-tech-spide>
- 107 <https://cpr.unu.edu/ai-global-governance-turning-the-tide-on-crime-with-predictive-policing.html>
- 108 <https://www.coindesk.com/thai-government-agency-develops-blockchain-tech-for-elections-voting>

Copyright

© 2020 The Economist Intelligence Unit Limited. All rights reserved. Neither this publication nor any part of it may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without the prior permission of The Economist Intelligence Unit Limited.

While every effort has been taken to verify the accuracy of this information, The Economist Intelligence Unit Ltd. cannot accept any responsibility or liability for reliance by any person on this report or any of the information, opinions or conclusions set out in this report.

**The
Economist**

**INTELLIGENCE
UNIT**

LONDON

20 Cabot Square

London

E14 4QW

United Kingdom

Tel: +44 (0) 20 7576 8181

Email: london@eiu.com

NEW YORK

750 Third Avenue

5th Floor

New York, NY 10017

United States

Tel: + 1 212 698 9717

Email: americas@eiu.com

HONG KONG

1301 Cityplaza Four

12 Taikoo Wan Road

Taikoo Shing

Hong Kong

Tel: + 852 2802 7288

Email: asia@eiu.com