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Foreword

'Project 2045: The Path to Peaceful and Prosperous Indonesia in 2045' is an excellent example of a research project that looks at long-term development prospects in a structured way and with a true partnership spirit between Indonesia, Japan, and the United Nations Development Programme (UNDP).

Over a period of one year, experts from Indonesia and Japan have analysed the development path of their respective countries and have identified options that can contribute to further building a peaceful and prosperous Indonesia.

The high-level seminar organised in Jakarta on 8 and 9 December 2018 presents those key findings and offers an opportunity for in-depth discussions on the development experiences of Japan and Indonesia looking towards the future.

I strongly believe that the research conducted and the outcome of those discussions will be of value to policymakers and all relevant stakeholders in Indonesia, and to their partners in Japan. They will also be of great interest to a broader group of actors in the development community, including UNDP, as we are working on those very same issues to support human development in Indonesia.

I would like to congratulate the governments and the people of Indonesia and Japan on the 60th anniversary of the establishment of their diplomatic relations. I wish to express my gratitude to the Government of Japan, to H.E. Mr. Masafumi Ishii, Ambassador of Japan to Indonesia, and to the Embassy of Japan in Indonesia for the support that they provided to UNDP. I also wish to most sincerely thank the President of ERIA, Mr. Hidetoshi Nishimura, and all his colleagues in Jakarta for the excellent cooperation that they have extended to UNDP throughout the implementation of the project. Lastly, I thank Executive Committee co-chairs Muhammad Lutfi, former Indonesian ambassador to Japan, and Takashi Shiraishi, chancellor of the Prefectural University of Kumamoto, Japan, as well as all the experts for their very substantive contributions to the project.

It has been a great honour for UNDP to be part of Project 2045.

Christophe Bahuet
Country Director, UNDP Indonesia

Foreword

'Project 2045: The Path to Peaceful and Prosperous Indonesia in 2045'is a blueprint for the cooperation between Japan and Indonesia on the occasion of the 60th anniversary of their bilateral diplomatic relationship. The Economic Research Institute for ASEAN and East Asia (ERIA), together with the United Nations Development Programme (UNDP), has implemented this project and set up the Executive Committee co-chaired by H.E. Muhammad Lutfi, the former ambassador of Indonesia to Japan, and Prof Takashi Shiraishi, chancellor of the Prefectural University of Kumamoto and a leading expert on Asian and Indonesian affairs, and is composed of experts in political science, economics, and other disciplines.

ERIA celebrates its 10th anniversary in 2018. Over the last 10 years, ERIA, as an organisation to support the ASEAN Summit and East Asia Summit process, has delivered many studies and policy recommendations to promote economic integration, the narrowing of development gaps, and sustainable development. ERIA's activities have been regularly mentioned in the summit and ministerial documents of ASEAN and East Asia.

It is our honour to have been requested to conduct Project 2045, the joint project of two of East Asia's important countries that share a common future and are both maritime democracies. The study lists 10 common 'Challenges' that need to be addressed jointly by the two countries, with due consideration of new technologies, energy and food security, shifting political and economic landscapes, and environmental and socio-cultural values. The study points out the complementarity of the two countries and the importance of their cooperation to fully realise their growth potential. The study also indicates the need for them to play a central role to contribute to the peace, prosperity, and economic integration of the region.

Last but not least, I would like to express our sincere appreciation to the Government of Japan, especially to Ambassador Masafumi Ishii and the staff of the Japanese Embassy in Indonesia, for giving us a chance to contribute to the future of Indonesia and Japan and providing continuous support and guidance for the success of the project.

Hidetoshi Nishimura

President, ERIA

Acknowledgements

This report is the main report of 'Project 2045: the Path to Peaceful and Prosperous Indonesia and Japan in 2045' on the occasion of the 60th anniversary of diplomatic relations between Indonesia and Japan. With funding from the Government of Japan, the United Nations Development Programme Indonesia and the Economic Research Institute for ASEAN and East (ERIA) have been implementing this project since March 2018.

ERIA set up an Executive Committee to create this report. It is composed of experts from political science, economics, and other disciplines; members of the business community from Indonesia and Japan; and international organisations. Indonesian government officials participated as observers.

The committee is co-chaired by Muhammad Lutfi, former Indonesian ambassador to Japan, and Takashi Shiraishi, chancellor of the Prefectural University of Kumamoto, Japan. The executive members are listed in Table 1.

The first executive committee was held at the end of March. Based on the discussions of the executive committee, a concept note was drawn up, which became the basis for the structure of the report. Many Indonesian and Japanese researchers have been involved in drafting the report. Its authors are listed in Table 2.

The editorial team is composed of Michikazu Kojima (Senior Economist, ERIA), Kiki Verico (Deputy Director of LPEM, Faculty of Economics and Business, University of Indonesia), and Nobuhiro Aizawa (Associate Professor, Kyushu University). The editorial group also received support in various forms from the Embassy of Japan, ERIA, Project Management Units of UNDP, and ERIA staff.

Moreover, various contributors and organisations including co-chairs and executive committee members provided insights on the future of technology development, ideas for future cooperation, and various kinds of background information to the writers and the editorial group.

We, the editorial group, greatly appreciate the guidance of the co-chairs, and the contributions of the executive committee members, writers, contributors, and staff members to this project. We hope the report will be a foundation for the partnership between Indonesia and Japan towards 2045.

List of Members of Executive Committee of Project 2045

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Indonesia	Dr. Rizal Affandi Lukman	Coordinating Min. of Economic Affairs	Deputy Coordinating Minister for International Economic Cooperation
Japan	Mr. Shinichi Yamanaka	JICA Indonesia Office	Chief Representative

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*Note: Professor Alisjahbana's contribution was made before she joined UN ESCAP as Executive Secretary and Under-Secretary-General of the United Nations effective on 1 November 2018.

Executive Summary

Our Common Future: A Joint Project of Two Maritime Democracies

One of the most important known unknowns in the path to 2045 is that the world, including our two countries, Indonesia and Japan, will undergo dramatic economic, social, political, and cultural transformations. In the 1980s, few of us could have imagined the world in which we now live, where smartphones and the Internet, artificial intelligence, the Internet of things, drones, and advances in biology and medical science have changed our lives fundamentally; where Indonesia is being led by a former mayor and governor turned president elected directly in a full-fledged democracy; and where Japan is no longer an economic superpower or even the largest economy in Asia. We can assume something equally unimaginable awaits us in 2045. And although we do not know what the world will look like by then, we know it will be radically different from the one we now know and that we should prepare for it in every way we can.

Technological advances will present us with major changes in the areas of business, employment, government, education, health, defence, and security. The challenges will be enormous. We therefore need to train people to meet all the challenges that will confront us, so that we can reap the benefits of technological transformation to make the world, as well as our two countries, a better place. Our countries have had their share of ups and downs in our histories. But they achieved, or are in the process of achieving, a life of plenty, freedom, and safety for our peoples thanks to the efforts, wisdom, courage, and commitments of our predecessors. Thus, we should be optimistic about our ability to meet the challenges we will face in the coming years.

The most important questions we should ask are what kind of countries we want to build, what positions we want to occupy in the Indo-Pacific region and the world, and what we can do together to achieve our objectives.

We both want to create a life of plenty, freedom, and safety in a society that is peaceful, stable, democratic, diverse, and tolerant. To achieve this, we need to invest in educating and training people who are not only technologically savvy and competitive, but also compassionate, able to thrive in diversity, and capable of meeting the challenges of the globalising world. Technological advancement without equivalent progress in morality, compassion, and human development could come at the cost of our life of plenty, freedom, and safety. Indonesia is an emerging nation with young population, and Japan is an advanced industrial nation with an ageing population. The two maritime powers and major democracies located strategically in the Indo-Pacific region can forge a joint partnership to achieve the kind of life we cherish and create a peaceful, stable, free, and open region for the good of all nations in the region and beyond.

Why do we believe a life of plenty, freedom, and safety in a society that is peaceful, stable, democratic, diverse, and tolerant is worth striving for?

It is because we can benefit most from the free flow of goods, ideas, services, and people if we educate and train our people to be technologically savvy and competitive in the global market place. It is also because we believe we benefit most from the increasing diversity if it is combined with tolerance and respect for differences. A life of plenty, freedom, and safety can only be built in a society where people are well-trained and competitive, and therefore confident of their ability to live in the world and where tolerance and respect for differences upholds diversity, stability, and democracy.

Our joint project to achieve these goals contributes not only to the future generations in Indonesia and Japan, but also to supporting the region's resilience against uncertain trends such as isolationism, populism, unilateralism, and violent fundamentalism. Our future depends on whether vibrant internationalism and democracy, which are indispensable for our future prosperity and confronting common challenges such as climate change, will be maintained and revitalised.

By the mid-2040s, Indonesia is forecast to be the world's fifth-largest economy and Japan the fourth, while China, the United States (US) and India will be the largest three economies. This means that the world, especially the Indo-Pacific region, will be far more multipolar that it is today, and Indonesia and Japan – two strategically located democracies – will have important roles to play in creating a peaceful, stable, free, and open region. The Indo-Pacific region is connected by a series of seas and straits from the Indian Ocean to the Malacca, Sunda, and Lombok straits, to the South China and East China seas. As maritime democratic powers, Indonesia and Japan must take the lead in keeping these seas and straits, especially the South China Sea, open and free.

Our two countries, together with the China, India, and the US, and Brazil, Germany, Mexico, and some others, will be the engine of global growth in the coming years. As such, we, together with other economies, share vital interests in maintaining and enhancing global trade that is free, fair, multilateral, and open. Asia's strength and future lies in connectivity and diversity. We must enhance diverse channels and choices of physical, institutional, and human connectivity in the region and beyond for our common security and prosperity.

Over the last 70 years we have been together through all the ups and downs and have developed very close relations of trust and respect. We share the responsibility to pass the baton of trust to the next generation. Together we must invest in this upcoming generation to encourage and support their joint projects, goals, and dreams. As maritime democracies in Asia with shared dreams, we must work together to strengthen and enhance our relations of trust and build a life

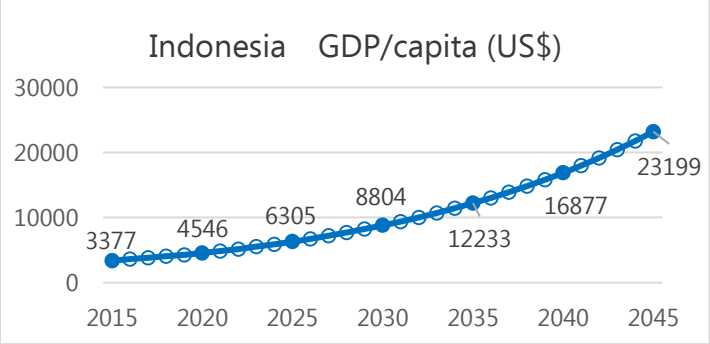
of plenty, freedom, and safety in a society that is peaceful, stable, democratic, diverse, and tolerant.

Background and Structure of this Report

'Our Common Future', the previous section, sets out the key messages of Project 2045. This indicates the direction of Indonesia and Japan towards 2045. The governments of Indonesia and Japan have produced separately some documents for future visions, such as Indonesian Vision 2045. Taking into accounts the existing vision documents of both countries, this report discusses the pathways to these goals and the enabling factors to achieve them. After a brief introduction to the visionary documents of Indonesia and Japan, the report discusses pathways to reach a common vision on Indonesia and Japan, based on 3 targets and 10 challenges identified by the Executive Committee.

Vision Indonesia 2045

Visi Indonesia 2045 (Vision Indonesia 2045) is developed by the National Development Planning Agency (BAPPENAS). The vision covers topics such as economic growth projections, demographic change, urbanisation and technology development. According *Visi Indonesia 2045(Draft Version in October 2018),* Indonesia's gross domestic product (GDP) per capita is projected to rise to $23,199 in 2045 from $3,377 in 2015. The dependency ratio (the ratio of people aged zero to 14 and those over the age of 65 to the working age population) will start to increase from 2020. The vision has four pillars: human resource development and science and technology advancement, sustainable economic development, equitable development, and strengthening national security and governance.



Source: Visi Indonesia 2045 (Draft Version in October 2018)

The human resource development and science and technology advancement pillar states that the gross enrolment ratio in tertiary education will reach 60% during 2036–2045, from 30% in

2015. The strategies to achieve this include achieving equal quality and services in education and transforming learning methods. The section also stresses increasing the contribution to science and technology development. Gross expenditure on research and development will rise from 0.08% in 2015 to 1.5%–2.0% in 2045.

The development of a creative digital economy is highlighted under the sustainable economic development pillar. It states that in 2045, Indonesia will be a world-class creative digital economy centre. Developing the maritime economy is also emphasised. Its contribution to GDP is expected to rise from 6.4% in 2015 to 12.5% in 2045 through the development of efficient and effective marine connectivity, sustainable and competitive fishing practices, and maritime tourism. Energy and water security and environmental protection are also stressed.

The equitable development pillar aims to accelerate poverty eradication, income equality, and equitable regional development. Infrastructure for improving physical and virtual connectivity is seen as a key to such equitable development.

The strengthening national security and governance pillar emphasises improving the quality of democracy, reforming bureaucracy including governance based on information and communication technology, and eradicating corruption. In addition, the country aims to play a greater role at the regional and global levels and in the United Nations.

Visions in Japan for around 2045

Unlike Indonesia, Japan does not have an integrated national vision document. However, many ministries have made visions or long-term strategies to 2050. Such sector strategies may be useful for Indonesia to consider more detailed actions in line with *Visi Indonesia 2045*.

The Cabinet Office of the Government of Japan proposed a vision of 'Society 5.0', in which big data collected by the Internet of things will be converted to a new type of intelligence by artificial intelligence and will reach every corner of society. Such technologies are expected to solve challenges such as increased energy and food demand, ageing, international competition, regional inequality, greenhouse gas reduction, and sustainable industrialisation.

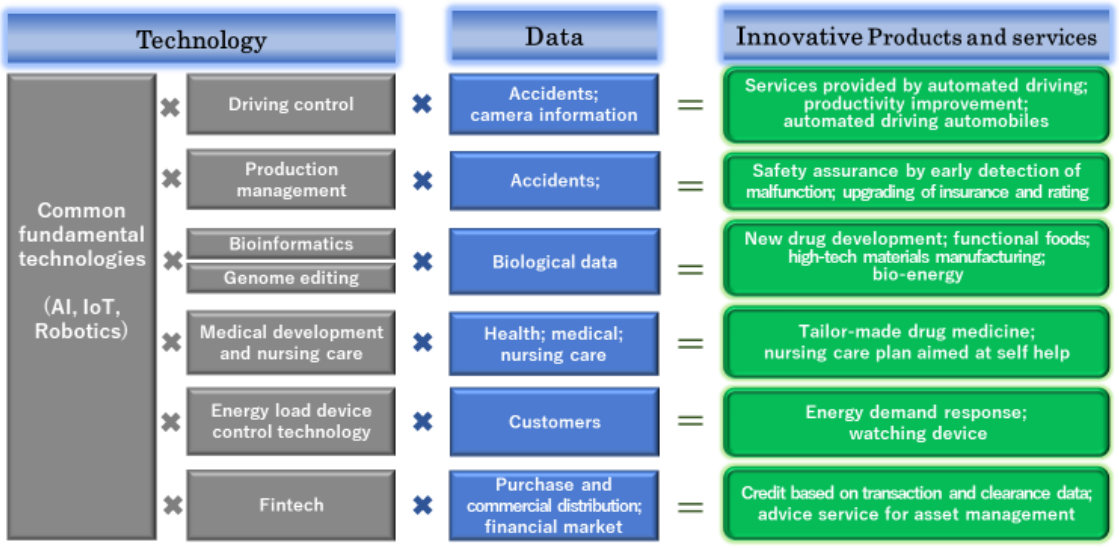
The Ministry of Education, Culture, Sports, Science and Technology also formed a committee to consider what kind of education should be provided to facilitate Society 5.0. The committee, which reported in June 2018, proposed using EduTech (educational technology) and big data in elementary school, strengthening education in data science and statistics, revising the teacher licence system, and developing human resources in the humanities and social sciences with artificial intelligence.

The 'Vision of New Industrial Structure' compiled by the Ministry of Economy, Trade and Industry also regards artificial intelligence, the Internet of things, and robotics as common fundamental technologies to create innovative products and services in the future. Such

technologies will be applied in fields such as driving control, production management, developing new pharmaceuticals, nursing care, energy demand response, and fintech. Such technologies are regarded as solutions for Japan's major 21st century challenges, including its ageing society. The dependency ratio is expected to rise from 64.5% in 2015 to 90.6% in 2045.

To mitigate the shortage of labour, the number of migrant workers increased to 1.27 million in 2017 from 0.48 million in 2008. Teleworking is also being considered as a policy to help women with young children contribute to the labour force. The migrant workers, technologies, and women's workforce participation are expected to offset the decrease in Japan's labour supply.

Creation of Innovative Products and Services



Source: Ministry of Economy, Trade and Industry of Japan 'Vision of New Industrial Structure'.

Three Common Targets and 10 Challenges towards 2045

Taking into account these visions, the Executive Committee argues our common future articulated above, and identify three common targets: (1) to uphold democracy and become maritime global powers; (2) to rank amongst the world's top five economies; (3) to achieve high quality of life beyond SDGs 2030. These targets are formulated into 10 concrete challenges which will be overcome through cooperation between Indonesia and Japan. The Economic Research Institute for ASEAN and East Asia, as an implementing organisation, asked experts from Indonesia and Japan to discuss these challenges and corresponding policies as follows.

Challenge 1. Sustaining Democracy and a Diverse Society

Challenge 2. Enhancing Maritime Security and Rule Based International Order

Challenge 3. Strengthening Regional and Global Supply Chains

Challenge 4. Developing Infrastructure

Challenge 5. Strengthening the Economy through Investment

Challenge 6. Developing Human Resources

Challenge 7. Vitalising the Rural Economy

Challenge 8. Towards an Equitable Society

Challenge 9. Digital Technologies to Improve Quality of Life

Challenge 10. Resiliency to Natural Disaster, Tackling Climate Change, and Managing Natural Resources

Challenges 1 and 2 consider political aspects from a domestic and international context. They are rephrased as becoming a maritime and moderate global power based on universal values. In relation to achieving and maintaining a position in the top five economic ranking in the world, Challenges 3 to 7 pointed out pathways to be top 5 economies, such as importance of being a part global supply chains through international trade and foreign direct investment, and necessity of infrastructure development and human resources development. Challenges 8 to 10 focus on how to address social issues to achieve high quality of life, such as by reducing social disparities, strengthening resiliency against natural disasters, and promoting environmental sustainability to achieve sustainable development and beyond, with the aid of digital technology.

Key Messages on Political, Economic, and Social Aspects

First, common political target: To uphold democracy and become maritime global powers

Our dream for the people of Indonesia and Japan is to create a life of plenty, freedom, and safety in a society that is peaceful, diverse, and tolerant. To realise this dream, not only is it crucial to sustain our democracy, but democracy is also necessary to build resilience for the future challenge of the trend towards increasing diversity in Indonesian and Japanese society.

Indonesia is blessed with a strong foundation on the national motto, *Bhinneka Tunggal Ika* (Unity in Diversity), which is now also the motto of the European Union and South Africa. Japan is also

one of the most sustained democracy in Asia with a population of more than 100 million. Based on the foundation our predecessors have built, Indonesia and Japan need to develop their joint partnership to jointly tackle the challenges of maintaining democratic, diverse, and united societies.

The challenges to democracy, diversity, and unity are immense. With technological advancement, democracies will face a new style of foreign interference from 'sharp powers' that try to exert political influence through cyber-attack from within and outside our society with the intention of undermining our democratic principles and eroding public trust in government.

Tackling economic disparity is another prime challenge that will benefit from cooperation. Economic disparity can easily ignite hostility and trigger false information leading to identity politics, which undermines unity and political tolerance of our social diversity. Our natural advantage of diversity is the foundation of a society where creativity and innovation thrive. Because of these challenges ahead, we would like to preserve our foundation of *Bhinneka Tunggal Ika* and democracy.

The roles of Indonesia and Japan in enhancing democratic principles do not end within our nations. It is also important to play a proactive role in making the regional political environment benign to preserve democracy with the aid of advanced technology. Japan has harmonised its democracy and cultural and social traditions with modernisation. Indonesian leaders have shown leadership, wisdom, and a model – especially of moderate Islam – for a diverse and socially resilient society in times of political and social transition. This history would be the foundation for and a pre-requisite of our dream of a life of plenty, freedom, and safety in a diverse and tolerant society.

Both Indonesia and Japan, as two maritime democracies and archipelago nations, are well-positioned to further co-operate and contribute to sustaining regional security in an era of major shifts and challenges in the global order. Partnerships and joint projects are needed in the field of security, especially in enhancing maritime security and cyber security capacities, to make our maritime zone an arena of prosperity rather than conflict. We would like Asia to remain the engine of global growth in the decades ahead, and this will necessitate a stable and open region and the joint building of our capacity to achieve the goals.

Uncertainty is everywhere. Major powers in the coming decades, such as China, India, and the United States, will naturally seek to assert themselves unilaterally. Thus, we need to strengthen our ties as two regional powers that share common principles, character, and geopolitical setting. In strengthening our principle of democracy, rules-based society, respect for human rights, and economic growth, we also need to shape the international and regional order to reflect our principles. We will pursue a course based on the established approach of independence, non-

intervention, and multilateralism that seeks to build stability and openness rather than to dominate others.

Second, economic target: To rank amongst the world's top five economies

Our economic goal is to be ranked amongst the world's top five economies. According to Vision Indonesia 2045 (Draft in October 2045), Indonesia's GDP will become the fifth-largest in the world, in a 'high scenario', while Japan will become the fourth-largest in the world. The Executive Committee discussed how the two countries can work together to achieve overcome the economic challenges ahead.

The fourth industrial revolution. Collaboration between the two countries can help them respond to the economic challenges posed by the fourth industrial revolution, which is expected to make competition tighter and more transparent. Collaboration based on long-established production networks and value chains will help both countries produce high-quality products for global markets, increase demand, and generate customer loyalty. The export-led growth of Indonesia, supported by investment from Japan, will therefore be the basic formula for the common prosperity of both countries. The two governments should conduct a joint study on how to enhance Indonesian exports. Export-led growth will raise manufacturing productivity as global market access expands, and this will stimulate foreign direct investment (FDI) inflows. Free trade and economic partnership agreements will continue to be important drivers of export-led growth and FDI.

Tighter competition in the era of the fourth industrial revolution makes the supply-side role important for both countries. Necessary and sufficient conditions are in place for supporting supply side. The necessary conditions include infrastructure of sufficient quantity and quality (roads, ports, warehousing, and industrial parks); utilities (electricity, water access, gas, and internet connectivity); and an educated, skilled, and healthy workforce. Structural reform; regulatory review; transparent and fair taxation; and research, development, and design (RDD) are the sufficient conditions. Both need to be met to optimise economic development in the two countries.

A report released in 2014 by the Ministry of Industry, Indonesia that showed incentives for RDD rated most important by entrepreneurs. But the proportion of research and development expenditure to GDP in Indonesia (0.08%) lags that of its neighbours Singapore (2.2%), Malaysia (1.3%), Thailand (0.6%). Indonesia needs to considerably increase its budget allocation for RDD activities under the triple helix model of university–industry–government cooperation. The country also needs to increase the number of skilled engineers and upscale their RDD skills and abilities.

The use of communication technology must be massively increased to reduce transport costs, support entry into the global production networks of the fourth industrial revolution, and achieve sustained and inclusive economic development. In developing infrastructure, Indonesia needs to enhance the role of the private sector in collaboration with the government.

The regional sphere. Indonesia and Japan are members of the Regional Comprehensive Economic Partnership (RCEP) negotiations, together with other members of the Association of Southeast Asian Nations (ASEAN) – Australia, China, India, the Republic of Korea, and New Zealand. Indonesia has played very significant role in ASEAN as the most democratic country that promotes pluralism. However, its infrastructure and physical capacity readiness is behind that of Brunei, Malaysia, and Singapore. Japan could support Indonesia in the RCEP negotiations as Indonesia strives to enable its small and medium-sized enterprises to leverage the agreement and cope with challenges arising from globalisation and trade liberalisation. Japan believes that Indonesia's indigenous development is a key to achieving the long-term goal of sustained economic advancement.

Investment. Indonesia expects to attract a higher proportion of manufacturing investment in a wider range of sectors as it upscales its technological level. Investment with a large role for RDD and innovation will be the priority for both the home and host countries. Indonesia must consistently reform and simplify its regulations to provide an attractive investment climate for all investors. In the fourth industrial revolution and beyond, Indonesia and Japan must strengthen their economic cooperation in innovation and RDD in support of manufacturing. This will require both increasing the quality of human capital (labour-augmenting technological progress) and upscaling the technology component (labour-saving and capital-augmenting technological progress). Indonesia must therefore enhance its human capital skills and educational level in line with future technological advancements. Japan is the right partner to assist Indonesia in enhancing the quality of its human capital and infrastructure. Vocational training in close collaboration with Japanese companies (including work experience in Japan) should be further accelerated. Human resource development for engineering and manufacturing industries in Indonesia will remain an important agenda for both governments and companies. Economic cooperation between Indonesia and Japan in the global production network, as well as in infrastructure development, investment, manufacturing enhancement, and human capital empowerment, will help reduce poverty and income inequality between Java and other parts of the country. It must improve rural development, particularly in the areas of education and health, and increase both agriculture productivity and farmers' welfare.

Third, social target: To achieve high quality of life beyond SDGs 2030

Mitigating disparities. To tackle social disparities, Indonesia should capitalise on the opportunities provided by its demographic dividend. Improving the quality of human resources

will optimise this dividend. There is a wide disparity in the education achievement of children from households with incomes in the bottom 20% and those in the top 20%. Access to quality health care has yet to be provided for all Indonesians. To mitigate social disparities, it is proposed to enhance Japan's FDI and its links to micro, small, and medium-sized enterprises; provide vocational education and training linked to industry; and develop infrastructure in rural areas.

The use of digital technology, especially communication technology, offers scope for reducing social disparities. Communication technology can enable children living in remote areas and in low-income families to access high-quality education. It can also promote free or low-cost long-distance learning, both in regular and vocational schools, enabling educational needs to be served in an equitable manner regardless of location and social status. Many healthcare services can be provided through telemedicine. Such technology could also be used to create jobs in remote area. It is therefore important that the infrastructure to use communication technology is provided equally and the education to use digital technology is strengthened.

The 'smart city' concept will be extended and implemented throughout most Indonesian provinces to cope with the anticipated scale of urbanisation. According to the United Nations (2018), more than 55% of the world's population lives in urban areas, and this figure is set to rise to 68% by 2050. The smart city concept is about using technology to optimise city operations and urban flows, and/or about introducing smart governance, in which policymaking is more flexible, practical, and closer to citizens.

Preparing for disasters. Both Indonesia and Japan are prone to natural disasters such as earthquakes, tsunamis, volcanic eruptions, and flooding. We cannot prevent such disasters, but we can reduce their risks by conducting evacuation drills and rescue exercises, preparing emergency food supplies and temporary housing, and drawing up disaster management plans. Digital technology should be utilised to improve disaster resiliency. Early warning systems for earthquakes, tsunamis, flooding, and other disasters should be put in place soon in Indonesia. Japan is a leader in the use of such technologies.

Spurred by the most recent disasters and the subsequent reconstruction of earthquake-affected parts of Lombok and rebuilding of the tsunami-affected areas in Palu and Donggala in Central Sulawesi, disaster management is becoming one of the issues of priority for the Government of Indonesia. Japan has supported early warning systems by providing high-technology equipment for the early detection of tsunamis and equipment for monitoring the movements of earth's tectonic plates. In addition, there is scope for experts and researchers from Japan to co-operate more widely with researchers and geologists from Indonesia in mapping disaster-prone areas. This information could help ensure central and district governments are more prepared when disasters strike so the death toll and impact can be minimised.

Ensuring environmental sustainability. Indonesia has ratified the Paris Agreement through Law No. 16/2016, showing commitment to strengthen the response to climate change, which has become an urgent threat to the nation. Mitigation and adaptation measures should be implemented though policy regulation and the institutional setting. The national commitment towards a low-carbon and climate-resilient development path are consistent with the Nine Priority Agendas (*Nawa Cita*) Framework determined by President Joko Widodo. Indonesia has pledged to reduce greenhouse gas emissions by 26% through its own efforts and by up to 41% with international support. Indonesia's projected economic and population growth will increase energy consumption. The use of renewable energy, such as replacing the development of new coal-fired power plants with clean and renewable energy sources, is therefore an important element. Renewable resources such as fisheries and forests should be used sustainably too. To improve air and water quality and to preserve ecosystem on land and in ocean. cleaner technologies should be promoted in various sectors, including the small and medium-sized enterprise sector. Digital technology should be used for monitoring resource stocks and pollution levels.

Proposal to Establish Follow-up Committee

The Executive Committee of Project 2045 agrees on the need to set up a joint follow-up committee to facilitate the realisation of joint projects based on the proposals through the discussion of executive committees (See Annex), to review the progress of cooperation between Indonesia and Japan and make further recommendations.

References

BAPPENAS (2018), *Vision 2045*. Jakarta: National Development Planning Agency.

United Nations (2018), *World Urbanization Prospects: The 2018 Revision.*

※ Sustainable Development Goals and recommendations proposed in Project 2045

The Challenges relate to several of the Sustainable Development Goals (SDGs) adopted by the United Nations in September 2015.

Challenges 1 and 2 are closely related to Goal 16, which aims to 'promote just, peaceful and inclusive societies', and Goal 17 to revitalise the global partnership for sustainable development'.

Challenges 3 to 7 contribute to Goal 1 – end poverty in all its forms everywhere, Goal 2 – zero hunger, and Goal 8 – promote inclusive and sustainable economic growth, employment and decent work for all. Challenges 3 and 5 focusing on global supply chains and investment address policy related to industrialisation, which is dealt with in Goal 9 – build resilient infrastructure,

promote sustainable industrialisation and foster innovation. Challenge 4, on infrastructure, relates to Goal 9, Goal 6 – ensure access to water and sanitation for all, and Goal 7 – ensure access to sustainable, reliable, sustainable and modern energy. Challenge 6 on human resource development is also related to Goal 9 and Goal 4 – quality education. Challenge 7, on vitalising the rural economy, relates to goals 2, 5 – achieve gender equality and empower all women and girls, and 10 – reduce inequality within and amongst countries. Challenge 8, focusing on social disparity, contributes to goals 4, 5, and 10. Challenge 9 stresses the application of digital technology to education (Goal 4) health care (Goal 3 – ensure healthy lives and promote well-being for all at all ages). Challenge 10 deals with resiliency to disasters and environmental sustainability, which are addressed in various goals, including goals 7, 11 – make cities inclusive, safe, resilient and sustainable, 12 – ensure sustainable consumption and production patterns, 13 – take urgent action to combat climate change and its impacts, 14 – conserve and sustainably use the oceans, seas and marine resources, and 15 – sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss.

Section 1

To Uphold Democracy and Become Maritime Global Powers

Our dream for the people of Indonesia and Japan is to create a life of plenty, freedom, and safety in a society that is peaceful, diverse, and tolerant. To realise this dream, not only is it crucial to sustain our democracy, but democracy is also necessary to build resilience for the future challenge of the trend towards increasing diversity in Indonesian and Japanese society.

Indonesia is blessed with a strong foundation on the national motto, Bhinneka Tunggal Ika (Unity in Diversity), which is now also the motto of the European Union and South Africa. Japan is also one of the most sustained democracies in Asia with a population of more than 100 million. Based on the foundation our predecessors have built, Indonesia and Japan need to develop their joint partnership to tackle the challenges of maintaining democratic, diverse, and united societies together.

The challenges to democracy, diversity, and unity are immense. With technological advancement, democracies will face a new style of foreign interference from 'sharp powers' that try to exert political influence through cyber-attack from within and outside our society with the intention of undermining our democratic principles and eroding public trust in government.

Tackling economic disparity is another prime challenge that will benefit from cooperation. Economic disparity can easily ignite hostility and trigger false information leading to identity politics, which undermines unity and political tolerance of our social diversity. Our natural advantage of diversity is the foundation of a society where creativity and innovation thrive. Because of these challenges ahead, we would like to preserve our foundation of Bhinneka Tunggal Ika and democracy.

The roles of Indonesia and Japan in enhancing democratic principles do not end within our nations. It is also important to play a proactive role in making the regional political environment benign to preserve democracy with the aid of advanced technology. Japan

has harmonised its democracy and cultural and social traditions with modernisation. Indonesian leaders have shown leadership, wisdom, and a model – especially of moderate Islam – for a diverse and socially resilient society in times of political and social transition. This history would be the foundation for and a pre-requisite of our dream of a life of plenty, freedom, and safety in a diverse and tolerant society.

Both Indonesia and Japan, as two maritime democracies and archipelago nations, are well-positioned to further co-operate and contribute to sustaining regional security in an era of major shifts and challenges in the global order. Partnerships and joint projects are needed in the field of security, especially in enhancing maritime security and cyber security capacities, to make our maritime zone an arena of prosperity rather than conflict. We would like Asia to remain the engine of global growth in the decades ahead, and this will necessitate a stable and open region and the joint building of our capacity to achieve the goals.

Uncertainty is everywhere. Major powers in the coming decades, such as China, India, and the United States, will naturally seek to assert themselves unilaterally. Thus, we need to strengthen our ties as two regional powers that share common principles, and similar characters and geopolitical settings. In strengthening our principles of democracy, rules-based society, respect for human rights, and economic growth, we also need to shape the international and regional order to reflect our principles. We will pursue a course based on the established approach of independence, non-intervention, and multilateralism that seeks to build stability and openness rather than to dominate others.

Challenge 1

Sustaining Democracy and a Diverse Society

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Our dream is to create life in Indonesia and Japan that is of plenty, freedom, and safety and in societies that are peaceful, diverse, and tolerant. In pursuit of this dream, sustaining democracy is crucial, and we are also responsible for being resilient for the future generation. Indonesia is blessed with its strong foundation on the national motto, Bhinneka Tunggal Ika, or 'Unity in Diversity', which is now a motto the European Union and South Africa also follow. Japan has also been one of the most sustained democracies in Asia for almost 70 years, with a population of over 100 million. Based on the foundation our predecessors have built with their wisdom and efforts, Indonesia and Japan need to strengthen their ties to work together in tackling the challenges we face in maintaining our democratic, diverse, and united societies.

The challenges facing democracy, diversity, and unity are immense. With technological advancement, democracies will face new challenges in the form of 'sharp power', which can use technological strength to undermine our democratic principles. These challenges could weaken public trust in the government through cyber technology and threaten the political platform of an elected government. Economic disparity is also a challenge for maintaining trust in democracy due to its effect of weakening the sense of tolerance among the members in society. This could create vulnerability in maintaining unity and

diversity, which should function as the platforms for innovation, growth, and security.

Because of these challenges ahead, we would like to strengthen our foundation of unity in diversity and democracy. Technological progress without the equivalent progress in humanity can fail us. The information revolution, which has led to unprecedented lifestyle, business, and governance changes for society, requires a moral revolution in tandem – a moral revolution that can make people compassionate to diversity and inequality amidst the most tech-savvy generation in both of our nations.

Upholding Democracy as the Basis for Prosperity and Security

Democratic governance faces the following challenges.

1. Economic disparity leads to an undermining of public trust in the process of consensus building. Should the process of consensus building be seen by the people as a trade-off for effective governance, they may support an effective but exclusive method of authority and administration. This could seriously undermine the traditions and principles of Indonesia and Japan for maintaining unity in society.
2. Digitalisation and artificial intelligence undermine sovereignty and credibility and polarise the political spectrum. The risk is that democracy could be considered a liability for effective governance, especially in times of global economic competition vis-à-vis non-democratic countries.
3. Higher population mobility and increasing numbers of foreign migrants could challenge the sense of tolerance and unity. Increasing numbers of incoming foreign migrants are an irreversible trend of globalisation and should be considered a blessing. However, in times of economic difficulty, the divide between nationals and foreigners could challenge the idea of national interests and the public interest, especially in countries like Indonesia and Japan where nationalism carries strong political legitimacy.

Thus, the following are suggestions for areas of cooperation.

1. Democracy education. Democracy should be understood in the sense of 'political participation, dialogue, and public interaction' rather than as a mere

'competitive electoral system'. A key role of Islamic organisations in Indonesia is to strengthen the country's commitment to democracy. Investing in high school and university students for exchange is also crucial.

2. Enhancement of the electoral management security system. Technological cooperation, the establishment of an electoral datacentre, and the prevention of cyberattacks on the electoral process are needed. Threats could come in the form of sharp power, undermining the democratic principle, or they could be simply the rich and powerful manipulating the public's information.
3. Coveillance systems to guard against a systematic attack from a foreign state or company, and the democratisation of cyberspace. Enhancing cybersecurity is of paramount importance. In order to do so, public support for the freedom of information is much needed. A monopoly on information could lead to the absolute manipulation of justice. The state should take the responsibility to protect its people from an abuse of information. Working together to create an anti-information-abuse mechanism of governance is, therefore, key.

Enriching the Islamic Foundation

In order to maintain a democratic, free, and diverse society, we need to count on the leading role of Indonesia's Islamic foundation. Indonesia is not just the largest Muslim majority nation by population but is also a leading model where multiple religions, strong nationalism, and decentralised democracy work together. This foundation should be strengthened in the country but also cherished beyond Indonesia in other countries. Japan is one of those countries as it is becoming a more plural society. Specifically, Japan would be fortunate to have more Indonesian people in all fields of society. To make this happen, we need Islamic support and cooperation to help connect our societies and prevent extremism from making us demonise one another in times of frustration.

We all need the support from the Islamic organisation to keep democracy deeply rooted in our culture and not take it as just another administrative process. The Indonesian model is important since the impact of information and communication technology (ICT) on religious practice naturally includes the risk of radicalisation and the denial of democratic

national governance. Therefore, the proactive role of Indonesia's Islamic organisation in building a foundation for society with openness and political diversity should be encouraged.

Promoting Female Muslim Leaders

Another of Indonesia's leading features is the role of female Muslim leaders. Additional focus should be placed on matching Indonesia's talent and Japan's educational skills, and we would like to see leaders in multiple fields of technology, business, and governance. A female leader in the style of Dr Habibie, a prominent female leader in technology, religion, and government, could be a valuable role model for our societies.

Promoting female Muslim leaders and making the best of the Japanese education, business, and governance systems would create great assets for promoting prosperity with pluralism, diversity, and tolerance both in Indonesia and in Japan. The help of Indonesia's Islamic society of Indonesia, with a special focus on female leaders, is much needed in Japan. Japan is committed to enhancing the expertise of the young generation as a top priority – thus, our cooperation would be most fitting in the long term. A bilateral initiative between Indonesia and Japan for setting educational standards and professional career paths for female Muslims could be used as a model example for other Islam-majority countries.

Disaster Management and Relief

Indonesia and Japan share key features in their landscape, seascape, and geological and meteorological conditions. We are both major maritime archipelago countries – and, unfortunately, we share plentiful experiences of natural disasters, such as tsunamis, earthquakes, volcanic eruptions, and floods. The two countries lie on a volcanic belt and tectonic meeting points, and climate change is an irreversible trend.

Natural disasters are inarguably a common major security threat and major social risk that not just claim lives and have negative impacts on our economic activities but also reveal political and social divides. Disaster management and relief can test the sense of justice of governance in a diverse society. Depending on its governance performance, a government can either unite or divide a society in times of disaster. Indonesia and Japan should work together in a wider spectrum for the sake of disaster management, control, and relief. This

spectrum could include shared military exercises, shared governance knowledge and training, and enhanced shared monitoring and data centres. The two maritime archipelago countries can use this cooperation to take the leadership in tandem and as the pillar of our relationship. Investing in people and the institutions in charge of disaster relief and management should be one of the top priorities in the coming future.

Changing Styles of Governance and Infrastructure

Governance skills will be enhanced and transformed by the continuous pressure arising from the demands and challenges of technological advancement, rapid urbanisation, climate change, and economic disparity. The idea of investing in digital infrastructure should be considered as a public service, not a private corporate investment. The expanded scope of ICT is now not limited to security and business but also increasingly involving core governance activities as well. This digital infrastructure, together with databases, will naturally and ultimately be the new pillar of sovereignty. Information, together with territory and people, will be included in the core domain of sovereignty and government. This will lead to a rearrangement of the idea of public infrastructure. Maintaining stability in society requires keeping communication networks, such as satellite systems, datacentres, and supercomputers, secure.

Urbanisation and Inequality

Urban areas can be an engine of growth but also a prime stage for political and social conflict. Our nations are dependent on the well-being of their megaregions, such as Jabodetabek and the Greater Tokyo Area, each with more than 20 million people. These are enormous assets, but they also pose immense challenges. We share the same size of urban zones, but our challenges are different. Thus, to keep our nations stable and open, we should support each other and mutually manage our needs to ensure our societies remain connected, plural, secure, just, and open.

The common emphasis of our strategies should address enhancing liveability in the urban megacities. This includes both infrastructural and moral upgrades. An environmental upgrade is also crucial, and accessible healthcare for all social classes could provide a foundation for making our diverse society more prosperous and dynamic. In doing so, we would need to accommodate local government leaders and facilitate strong and constant communication, with a priority on intra-city rather than inter-city infrastructure investment. The urban governance partnership should also be a partnership of lifestyle and a trust-building mechanism for managing growing urban issues. ‘Enhancing liveability’

could be a shared standard and purpose of urban governance for decades to come and also a shared dream for the generations to come.

Enhanced Human Mobility, Capacity, and Matching

Japan is facing an ageing society challenge, while Indonesia needs to enhance the skill set of its young human resources to overcome the middle-income trap. Japan needs to attract high-skilled professionals to maintain its connectivity in the Asian human resources market, and Japan, especially, expects Indonesia to be a major partner in sharing those talents. Japan also needs to attract what is currently considered as low-skilled labour and turn it into high-skilled labour. Prime examples are the agriculture and fishery sectors. In both industries, farmers and fishermen can integrate digitalisation skills into their marketing skills with production skills. Many professions could be rearranged to increase their value, and both governments need to work on establishing an effective system for job and workplace matching and enacting significant changes in immigration-related rules and regulations.

Establishing an Integrated Alumni Database

Indonesia and Japan have together developed numerous experts in the past century. However, they have not optimised and maximised the human capital that already exists. The key challenge has been the lack of coordination and communication. Both countries could cooperate easily and quickly to build an alumni database for creating an information platform for cooperation. The platform could be also be expanded to the broader region. The database would be an informal dialogue platform for policymaking, similar to what the United Kingdom has actively been doing – and, importantly, the proactive role of the experts who become the bridge between our nations could be the catalyst for shared social values in the long term.

Challenge 2
The International Order

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Japan and Indonesia, as two maritime democracies and archipelago nations, are in a strong position to further cooperate and contribute to sustaining regional security in the coming decades of a major shift and challenges in the global order. We would like Asia to remain the primary engine of global growth in the decades ahead. To make this a reality, we urge governments to take the initiative to keep the Indo-Pacific region stable and open.

Uncertainty is everywhere. It is natural for the major powers in the coming decades, such as the United States (US), China, and India, to seek unilateral and assertive action. This could corner smaller countries into inconvenient strategic choices. Indonesia and Japan need to strengthen their ties as two regional powers that share common social and political principles, characters, and geopolitical settings. In strengthening our principles of democracy, a rules-based society, respect for human rights, and economic growth, we also need to shape the international and regional order to our principles. Our approach will be based on independence, non-intervention, and multilateralism without seeking domination over one another but rather the building of stability and openness.

Maritime Security and Sea Power: A Geopolitical Challenge

Maritime space has been the foundation of the global order for the past 300 years. This is due to the way global wealth has been created primarily through connectivity and

communication lines. Be they the Dutch, the British, or the US, the powers who aspired to shape the global order fundamentally structured their power around maritime order and access. Considering the geopolitics in the information revolution era, our wealth and power remain structured around communication and connectivity. Thus, it was inevitable that the restructuring of the international order would take place in the maritime space. Indonesia and Japan, both as maritime and archipelago nations are, therefore, on the front line of the new geopolitical challenge. As regional maritime powers, we need to take the lead in finding a new arrangement for the global order. Our strategic goal relies very much on whether the maritime space will become a zone of access and connectivity or one of confrontation and denial. As a regional power, our definition of maritime security has been defined as defensive. We do not perceive our maritime power as an offensive one aiming to annex another territory. As our definition of sovereignty is being more and more de-territorialised due to technological advancement and the interconnected global economy, being a leading maritime nation, we need to redesign our maritime strategies to be more proactive. As our wealth relies on connectivity, the accessibility of the maritime space and the security our lines of communication are of paramount importance for our national interests.

To set the maritime space as an open and inclusive zone, Indonesia and Japan need to create a mechanism for the sharing of information to secure the free flow of information, goods, and people. To train and acquire expertise, we should enhance our defence programmes and integrate them into the navy, coast guard, and police force. The sea lanes from Japan through Indonesia to India are amongst the busiest and most strategically placed in the world. With its high density and geostrategic value, our maritime space needs resilient mechanisms to prevent it from becoming a conflict zone.

Thus, it is crucial to consider the information gaps amongst stakeholders and to create a regional architecture to develop the transparency of the maritime space and maritime activities. These are necessary steps for accommodating assertive action in the region and for defining the maritime space not as an arena of conflict but as an open, wealth-generating zone.

Rule of Law

While the international order is now in transition, the importance of the 'rule of law' in international order is also increasing. History has shown major wars to be a method of rearranging the international order. However, with modern technology and societies being connected beyond boundaries, the conventional idea of war to bring order has to be avoided at all costs. While superpowers will structurally and naturally seek unilateral action based on their power, it is we, the regional powers, who must play the leading role in upholding legal-based order. Without legal order, the choice of a state's survival could be left to the superpowers, which could lead to Asia becoming a region of disintegration and competition rather than integration and cooperation. As our definition of sovereignty is no longer a set concept, rules-based order in a more connected world could be theme based. Indonesia and Japan jointly nurturing both regional and global mechanisms to support this rules-based order and the strong generation of legal expertise will be critical to our well-being and could also contribute to the common good of the wider Indo-Pacific region.

Cybersecurity

Cyberattacks are rapidly increasing in their range of targets, sophistication, and actors. Anything could be a target, and anyone could be an aggressor. We need to be aware that attacks may not only be on military forces, but the most serious ones could be systematic and coordinated attacks by a state to undermine another state's security and values or, in our case, democracy. Democracy is now being challenged by the so-called 'sharp powers,' as cyberattacks could easily instigate public distrust in a government and undermine the power base of a democracy. Public support is inarguably the biggest power in defence strategies. For democracies like Indonesia and Japan, it is at the heart of securing our democratic system to be resilient against not only forces from within our country but also from abroad as well.

Due to the nature of the cybersecurity dilemma, the more sophisticated the system you create, the more attention you will draw to being attacked in order to show the attacker's skills. So, two aspects are important. The first is to make sure there is a system or a legal setting for ensuring there are ways to counteract an attempted cyberattack. A cyberattack

will not stop unless there are serious costs. The second is the intention. An attack could simply be an individual showing off their skills, but it could also be a sophisticated and organised strategy for undermining the core values of a nation.

Defence Capability

The increase in autonomous systems and robotics will be an irreversible trend in establishing a new national security system in the decades to come. Countries with an edge in investing in technological advances will have an advantage, thus creating a new gap between countries that are capable and those that are not. Autonomous systems and robotics face a strong challenge as they do not have clear mechanisms for de-escalating tensions. Thus, we should work together for the modernisation of our defence systems and cooperate for both capacity building and for establishing a network of shared information and common standard practices.

An Alliance of Mayors and Governors

As our society is undergoing the trend of urbanisation, so should the international order. Many of the challenges in our society can be addressed in urban areas, and it is primarily the responsibility of mayors and governors to solve the issues. The governance standards of these local leaders will be key in the dialogue arena for the international order, or at least the Asian order. While international relations, measured by national power, could go through a series of deadlocks, this new layer to international society could be a key collaboration arena in the region. The advantage of mayors over national leaders is that they are pragmatists, not ideologists or nationalists. Their governance style is based on troubleshooting and is solution based. As Tokyo and Jakarta are amongst the biggest megacities in the world, full of social challenges and both governed by locally elected governors, the two cities should take the lead to create a new arena for cooperation and co-governance, especially in the nationalist era to come.

Global Governance Reform: The United Nations

The global governance system in the 20th century has shown its limits. The United Nations Security Council (UNSC) is now misrepresenting the state of the international society.

There are two problems. The first problem is the bias toward Europe. Four of the five permanent UNSC members are European countries, while the global power and economy are not structured in that way. The second problem is that Asia is represented only by China. With the growing power of China and the growing presence of China-led institutions coupled with the structure of the UNSC, the perception that 'Asia equals China' could be cemented in the international setting, which is troublesome. The above two misrepresentations in the United Nations are common challenges for both Indonesia and Japan. We should propose non-veto permanent membership.

Reframing the Liberal International Order

The liberal international order has been perceived as both a source of economic growth in a globally connected era and also a source of global inequality. Thus, political leaders are always being tempted to ignore or twist how much the liberal international order has functioned as a common space to grow. As our trade and interactions are expected to grow, the importance will not fade but rather increase, despite the current rise in nativism. The liberal international order has functioned as a system for maintaining justice in an era of economic interdependence, especially in terms of trade. However, it has also been treated as a source of global inequality. As we share the economic benefits and the political challenges attached to the existing order, we also share common strategic goals in reframing to survive the order.

An Alliance of Latitude

As the third unbundling is taking place and the flow of people is increasing on a daily basis, the world is connected, but there is one challenge to keeping the network active: time zones. Latitude could be a new geopolitical and geo-economic condition for enhancing technology, and, thus, Japan and Indonesia should create a forum for setting the standards.

Passing the Baton of Friendship and Trust

Challenges could arise if Indonesia and Japan do not learn enough about one another. This could lead to ill-informed leadership while human mobility between the two countries increases. The countries can cooperate by offering opportunities for exchange and sharing

amongst mid-career bureaucrats, local government leaders, parliamentarians, and educational institutions. It takes a generation to establish one, and that is what we have achieved thanks to the wisdom and efforts of our predecessors. We cannot afford to abandon this achievement. We need to grow and nurture this trust to enable it to become even more established, and this could prove to be an absolute comparative advantage for our two nations.

Section 2

To Rank amongst the World's Top Five Economies

Our economic goal is to be ranked amongst the world's top five economies. According to Vision Indonesia 2045 (Draft of October 2018), Indonesia's gross domestic product (GDP) **will become the fifth-largest in the world at around US$23,000 per capita per year**, in a 'high scenario', while Japan's will become the fourth-largest in the world. Indonesia's nominal GDP in US dollars is predicted to increase seven times from US$1 trillion (2017) with average economic growth estimated at above 6% until 2045. To achieve this, Indonesia needs an economy open to trade and investment. Therefore, strong collaboration with its major economic partner, Japan, is a key success factor. The Executive Committee discussed how the two countries can work together to overcome the economic challenges ahead.

The integrative economic challenges for both countries can be identified as openness in terms of their economy and politics, with values of moderation, tolerance, and pluralism. Indonesia has to increase its level of productivity through an enhanced role for Research, Development, and Design (RDD) and input-saving technological progress. Development in both countries has to be able to minimise any negative externalities and the use of energy and resources has to be environmentally sustainable.

Strengthening Regional and Global Value Chains and **Strengthening the Economy through Investment**. Industrial Revolution 4.0 modernises global and regional production networks and value chains including the bilateral economic relations of Japan and Indonesia. A most important channel for the country's economic network is foreign direct investment. It is significant not only in terms of filling the saving and investment gap in Indonesia, but also in terms of strengthening the economic relations between the two countries. Investment increases trade competitiveness and strengthens the bilateral economic cooperation between Japan and Indonesia.

Developing Infrastructure and Human Resource Development are the most important factors for the economic development of both countries. They are the basis for increasing productivity and reducing the development gap. Infrastructure development both in the western and eastern parts of Indonesia will reduce the economic gaps within the country, thereby increasing equality between the western and eastern part of Indonesia. Japan can help Indonesia to develop its infrastructure with technology, technical assistance, and capacity building. Bilateral economic cooperation between Japan and Indonesia in the manufacturing sector enhances their production network. Japan and Indonesia can collaborate in research and basic science, thereby creating innovation and invention towards industrial revolution 4.0. The governments of both countries need to support this network by providing physical infrastructure and supportive commercial policies.

Rural development, in the context of agricultural transformation, as well as the more equal distribution of economic activities across Indonesia's islands, is important not only for more regionally balanced development but also for supporting inclusive economic development. To revitalise the rural economies, the rural and non-rural economies will need to be synergised. In the case of Indonesia, two types of economic linkages should be strengthened. The first is the connectivity from rural to urban areas in general, and the second is the connectivity from the predominantly rural non-Java regions to the predominantly urban Java regions. Physical connectivity, such as through better roads and shipping lines, will open up more opportunities for rural economies, such as transporting village products to urban areas, or transporting people from urban areas to rural areas to enable them to directly consume agricultural products (such as visiting farmers' markets). In addition, consumers may enjoy agro-tourism in rural areas. The quality of bilateral economic relations depends on how this cooperation provides economic growth that increases employment, reduces income inequality, and supports sustainable development. Bilateral economic cooperation between Japan and Indonesia should improve agriculture and maritime sector productivity.

The fourth industrial revolution. Collaboration between the two countries can help them respond to the economic challenges posed by the fourth industrial revolution, which is expected to make competition tighter and more transparent. Collaboration based on long-established production networks and value chains will help both countries produce

high-quality products for global markets, increase demand, and generate customer loyalty. The export-led growth of Indonesia, supported by investment from Japan, will therefore be the basic formula for the common prosperity of both countries. The two governments should conduct a joint study on how to enhance Indonesian exports. Export-led growth will raise manufacturing productivity as global market access expands, and this will stimulate foreign direct investment (FDI) inflows. Free trade and economic partnership agreements will continue to be important drivers of export-led growth and FDI.

Tighter competition in the era of the fourth industrial revolution makes the role of the supply-side important for both countries. Necessary and sufficient conditions are in place for supporting the supply side. The necessary conditions include infrastructure of sufficient quantity and quality (roads, ports, warehouses, and industrial parks); utilities (electricity, water access, gas, and Internet connectivity); and an educated, skilled, and healthy workforce. Structural reform; regulatory review; transparent and fair taxation; and RDD are the sufficient conditions. Both need to be met to optimise economic development in the two countries.

A report released in 2014 by the Ministry of Industry, Indonesia showed the incentives for RDD rated as most important by entrepreneurs. But the proportion of research and development expenditure to GDP in Indonesia (0.08%) lags that of its neighbours Singapore (2.2%), Malaysia (1.3%), and Thailand (0.6%). Indonesia needs to considerably increase its budget allocation for RDD activities under the triple helix model of university–industry–government cooperation. The country also needs to increase the number of skilled engineers and upscale their RDD skills and abilities.

The use of communication technology must be massively increased to reduce transport costs, support entry into the global production networks of the fourth industrial revolution, and achieve sustained and inclusive economic development. In developing infrastructure, Indonesia needs to enhance the role of the private sector in collaboration with the government.

The regional sphere. Indonesia and Japan are members of the Regional Comprehensive Economic Partnership (RCEP) negotiations, together with other members of the Association of Southeast Asian Nations (ASEAN) – Australia, China, India, the Republic of Korea, and New Zealand. Indonesia has played a very significant role in ASEAN as the most democratic country that promotes pluralism. However, its infrastructure and physical capacity readiness is behind that of Brunei Darussalam, Malaysia, and Singapore. Japan could support Indonesia in the RCEP negotiations as Indonesia strives to enable its small and medium-sized enterprises to leverage the agreement and cope with challenges arising from globalisation and trade liberalisation. Japan believes that Indonesia's indigenous development is key to achieving the long-term goal of sustained economic advancement.

Investment. Indonesia expects to attract a higher proportion of manufacturing investment in a wider range of sectors as it upscales its technological level. Investment with a large role for RDD and innovation will be the priority for both the home and host countries. Indonesia must consistently reform and simplify its regulations to provide an attractive investment climate for all investors. In the fourth industrial revolution and beyond, Indonesia and Japan must strengthen their economic cooperation in innovation and RDD in support of manufacturing.

This will require both increasing the quality of human capital (labour-augmenting technological progress) and upscaling the technology component (labour-saving and capital-augmenting technological progress).

Human Capital. The extensive use of the Internet of things, blockchains, and machine learning, will significantly change production, management, and service efficiency. The massive utilisation of big data will substantially improve the accuracy and validity information for all economic activities including new materials innovation, creative industry enhancement, and economic cooperation architecture. All of the challenges that have emerged from the fourth industrial revolution have to be responded to by both countries

with persistent improvements in human capital and solid economic collaboration. Indonesia must therefore enhance its human capital skills and educational level in line with future technological advancements. Japan is the right partner to assist Indonesia in enhancing the quality of its human capital and infrastructure. Vocational training in close collaboration with Japanese companies (including work experience in Japan) should be further accelerated. Human resource development for engineering and manufacturing industries in Indonesia will remain an important agenda for both governments and companies.

All of these processes have to be environmentally friendly and follow the sustainable development principles of the green economy.

Challenge 3

Strengthening Regional and Global Value Chains in Japan and Indonesia

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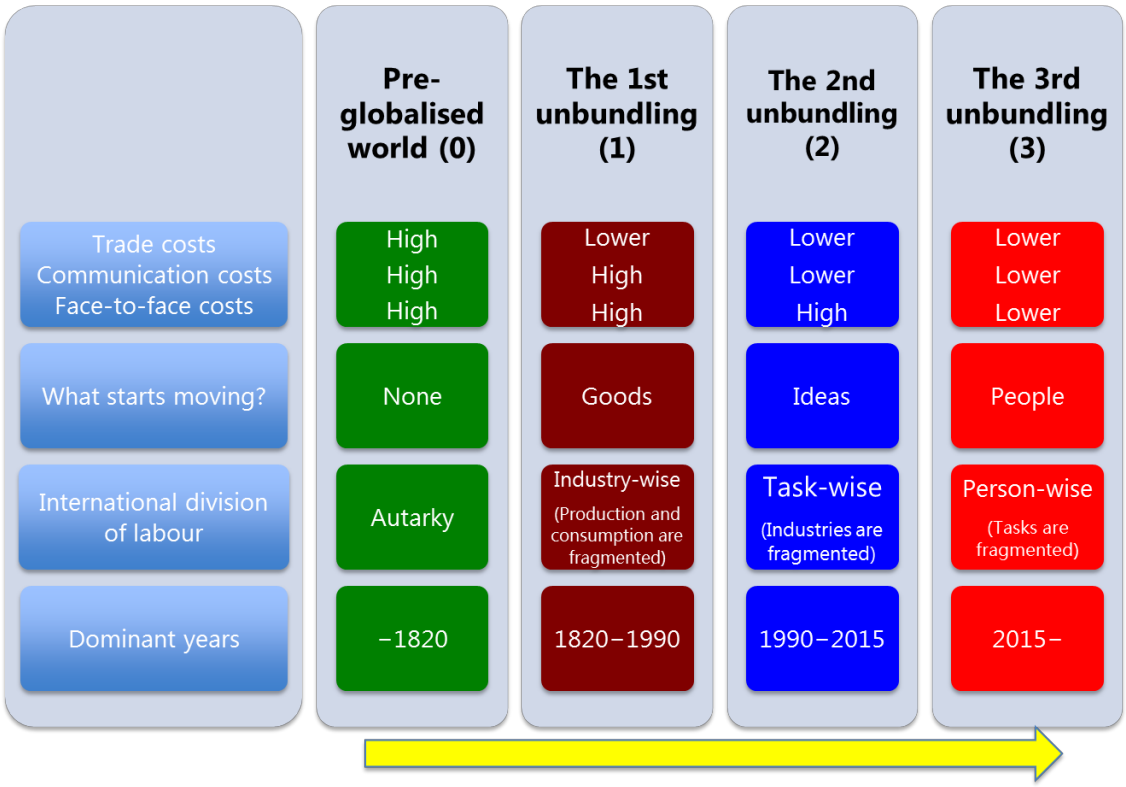
Evolution of the International Division of Labour

The conceptual framework of 'unbundling', proposed by Baldwin (2016), is useful for understanding the evolution of regional and global value chains, particularly for Association of Southeast Asian (ASEAN) Member States (Kimura, 2018). The concept of unbundling can be summarised as in Figure 3-1. In history, the first unbundling, or the industry-wise division of labour, emerged in the early 19th century with lowered trade costs through the steam revolution. The second unbundling, or the task-wise division of labour, started around 1990, when the information and communication technology (ICT) revolution drastically reduced communication costs. The third unbundling, or the person-by-person division of labour, will expand in the coming years thanks to the reduction in face-to-face costs resulting from the digital revolution.

In newly developed economies, such as Indonesia, different layers of unbundling coexist (Kimura and Chen, 2018). Businesses choose the appropriate form of unbundling when constructing their value chains. However, the applicable levels of unbundling are bounded due to physical conditions and the policy environment. In Indonesia, mining industries and plantation agriculture located in the outer islands typically operate their value chains in the first unbundling. Machinery industries and part of the advanced portion of the garment industry in the Java and Riau Islands go with the second unbundling for time-sensitive business-to-business (B-to-B) transactions. The third unbundling is about to emerge in the form of various new businesses that utilise the lowered matching costs in business-to-consumer (B-to-C) and consumer-to-consumer (C-to-C) transactions.

The challenge is how we can upgrade and expand our capabilities for enabling higher levels of unbundling to work. The key is connectivity.

Figure 3-1. Unbundling for Overcoming Distance



Source: Author.

Information Technology versus Communication Technology

To obtain a constructive perspective for the year 2045, we must understand the implication of the current digital revolution. Digital technology has two faces: information technology (IT) and communication technology (CT). Aghion, Bloom, and Van Reenen (2014) originally proposed the concept of IT and CT in the context of intra-firm organisation. Baldwin (2016) applied the idea to the context of the international division of labour. This is an insightful approach when we think of the implication of digital technology for newly developed economies.

IT, represented by artificial intelligence (AI), robotics, machine learning, and big data,

speeds up data processing, economises production processes, and reduces the number of tasks. Therefore, it is likely to generate concentration forces for economic activities. This may mean the possible re-shoring of manufacturing activities back to developed economies. On the other hand, CT, such as the Internet, smartphones, and 5G, overcomes distance, encourages the further division of labour, and generates dispersion forces for economic activities. From the viewpoint of newly developed economies, such as Indonesia, one thing we should do is utilise the feedback from piecemeal IT technologies and seek complementarity between machines and labour to revitalise existing industries. At the same time, CT must be aggressively utilised in order to generate new markets, new business models, and jobs. The aggressive use of CT has already started, not only in developed economies but also newly developed economies. The key is again connectivity.

Widening and Deepening International Production Networks

The mining industries and plantation agriculture located in Indonesia's outer islands, including Sumatra and Kalimantan, are connected directly to global value chains and operate in the first unbundling. Most of the light industries, such as the garment and footwear industries, mainly located in Java, also work in the first unbundling. Some cities in the outer islands, such as Medan and Makassar, seem to be populated enough to initiate more serious manufacturing activities even in the first unbundling. Basic physical logistics links, such as ports and roads, as well as the development of industrial estates, may help labour-intensive industries in some parts of the outer islands build up their manufacturing foundation.

As for the second unbundling, particularly international production networks in machinery industries, Indonesia as a whole lags behind its neighbouring ASEAN Member States, such as Singapore, Malaysia, and Thailand (Obashi and Kimura, 2017). Although links with machinery global value chains are established, efficient industrial agglomerations are not yet established. Compared with the Bangkok Metropolitan Area, the Jakarta Metropolitan Area is not well developed so as to nurture active vertical linkages between foreign and domestic firms. Surabaya is another centre to be enlarged. The Riau Islands do not show any signs of developing domestic vertical linkages. The formation of industrial agglomerations together with participation in international production networks is crucial

for local firms to obtain technology transfers and spillovers from foreign firms (Kimura, Machikita, and Ueki, 2016).

With a certain mass of population, other regions in Indonesia also have good potential for the second unbundling in their machinery industries. Such regions include cities in Java other than Jakarta and Surabaya, Medan, and Makassar. If those cities were in another country, they would naturally become industrial centres.

Facing the wave of the digital revolution, some people may be sceptical of the manufacturing sector. It is true that the service sector will become a major player in the digital era. However, the continuing efforts for manufacturing development are, and will continue to be, important for ASEAN Member States. In particular, countries with large populations, like Indonesia, must take advantage of job creation in the manufacturing sector, which greatly contributes to poverty alleviation (Kimura and Chang, 2017). Soft and hard infrastructure for the second unbundling, such as time-sensitive logistics networks, will also be helpful for stepping up to a higher level of unbundling.

During 2011–2016, we had a period called the 'slow trade' era, when the growth of total international trade became slower than the overall economic growth in the world. Some speculated the end of the global value chain era. However, such claims were not quite true. The slow trade can be explained mostly by a decline of trade in natural resources and materials. Parts and components trade in East Asia was actually growing steadily during the period (Obashi and Kimura, 2018). We still have room for further widening and deepening of the second unbundling in machinery industries.

The policies required for the second unbundling have already been well documented (ERIA, 2015). Institutional and physical connectivity for time-sensitive logistics links is required for participating in the second unbundling. In addition, infrastructure for industrial agglomeration must be prioritised in order to upgrade domestic industries. As for human capital, the relative shortage of managers and engineers is always a problem to be tackled.

Although IT is overall likely to accelerate the substitution between machines and labour, some production processes or tasks may require labour inputs complementary to machines. For example, the partial usage of 3D printers or robots combined with labour inputs is certainly a possibility. To catch up with technological advancement, participation

in international production networks may become even more important in the future.

The Digital Economy and Cross-border Services Outsourcing

The digital revolution with CT started with a drastic reduction in matching costs for B-to-C and C-to-C contacts and transactions. We observe that various new forums and businesses have recently been mushrooming in both developed and developing economies. Numerous platforms, big and small, have emerged through the Internet, including social media, e-commerce, matching for transportation, matching for lodging, and job matching. The costs to participate in such platforms are becoming lower for both providers and customers, and, thus, the platforms are becoming large and efficient marketplaces.

Indonesia has a large and young population, which is a big advantage for the digital economy. Incomplete regulation perhaps initially accelerated the introduction of new businesses with CT. However, now, consumers must be made to feel comfortable with the proper regulatory frameworks to achieve further market expansion.

CT also revitalises existing industries. The use of smartphones in agriculture and fishery, for example, is revolutionising their operations. Design and production in the garment industry may make big advances through computer-assisted design and manufacturing and 3D printing even from a distance. Value chains in the manufacturing sector can be managed and controlled much more efficiently with the Internet of things.

The implications of CT for inclusive growth are of interest. While we do care about fair competition and proper taxation for big platformers, the participants in platforms can be ordinary people, not necessarily college graduates. According to APJII (2018), the Internet-user penetration ratio is 72.4% in urban areas, 49.4% in rural–urban areas, and 48.2% in rural areas. By island, the penetration ratio is 57.7% in Java, 54.2% in Bali–Nusa, 47.2% in Sumatra, 72.1% in Kalimantan, 46.7% in Sulawesi, and 41.9% in Maluku–Papua. Although some gaps surely exist, the unevenness of digital connectivity seems to be much smaller than that of physical connectivity. CT may work as an equalising force.

How can we upgrade the use of CT to the third unbundling, or cross-border services outsourcing? The starting point would be domestic services outsourcing. Telecommuting, which starts within a firm, is already common in developed economies. Platforms for

matching services providers and consumers, such as Upwork, witmart.com, and Amazon Mechanical Turk are about to flourish. While various kinds of services used to be confined within a firm, in the near future, some of them will be actively outsourced through matching platforms.

Can these platforms extend their operations to newly developed economies? The answer is probably yes. If we randomly pick up one college graduate in Indonesia and another in Japan, the difference in their capabilities may be minimal. On the other hand, the difference in their wages will be substantial. Thus, once the large matching costs due to distance, language, culture, and financial links are reduced, the third unbundling, or cross-border services outsourcing, may become one of the major forms of the international division of labour.

What would be the role of the government? The related policies are threefold. First, we must secure digital connectivity and avoid digital divide. Interestingly, investment for digital connectivity has so far been done mostly by private initiatives rather than by huge public expenditure. The involvement of the government may be limited to providing trunk lines and regulating private Internet providers properly. Now, most of the ASEAN Member States are in the process of expanding 4G throughout their respective countries. The next challenge is to upgrade the digital connection to 5G. The 5G technology has already been established, and the ASEAN Member States must prepare for it quickly. It is important to catch up with or even lead the worldwide shift to the technology.

The second type of policy is those related to jobs and human capital. To aggressively utilise CT, we certainly need computer programmers, computer engineers, and entrepreneurs for new businesses. Thus, it is obvious for the government to expand higher education programmes to meet such demand for a new set of human capital. On the other hand, platform users may not be college graduates, which may open another possible channel for inclusiveness. The impacts of CT on the demand for human capital may be much more unpredictable and complicated. This suggests that the upgrading of general education is continuously important for taking advantage of CT.

Third, most importantly, the government must provide a proper regulatory framework for the private dynamism of CT usage. To further activate new businesses, the government may want to help start-ups, or at least not bother them.

Additionally, the policy environment for the 'almost' free flow of data with 'minimal' restriction must be achieved. The free flow of data, both domestic and cross-border, is crucial for invigorating CT-related businesses. However, the flow of data cannot be completely free. We have to consider a series of people's concerns. With proper backup policies, we can take advantage of the advancement of CT.

So far, backup policies for CT-related businesses are highly fragmented across countries. It is even difficult to find best practices in the world. However, the stocktaking of backup policies will certainly be useful for policymakers. The logic behind regulation should be clear to avoid inefficient and excessive regulations. Otherwise, the introduction of CT may be delayed with redundant regulations.

Backup policies include consumer protection; privacy protection; 'general exceptions', such as cultural preservation, public morals, and public health; intellectual property protection; non-discrimination and tariffs; and cybersecurity. In a wider scope, competition policy, taxation, and statistics may also need to be adjusted for CT-related activities. To take advantage of CT, the proper level of regulation, rather than too lenient or unnecessarily excessive regulation, is crucial.

The fragmented regulatory regime is costly. International cooperation and rule-making are very important. International organisations and various economic gatherings, such as the World Trade Organization, the United Nations, and the Asia–Pacific Economic Cooperation, have recently tried to seek a common denominator for the desirable regulatory framework in the era of the digital economy. However, such efforts seem to require substantial time and effort before bearing concrete fruit. Even the United States and the European Union cannot easily reach a conclusion on a number of important issues, let alone big, newly developed economies, such as China and India. Indonesia and Japan must, therefore, catch up with international rule-making.

Japan and Indonesia

To upgrade the capability of utilising higher levels of unbundling, Japan can work with Indonesia in many ways. Table 3-1 tabulates the major policy modes that are required for each level of unbundling in terms of institutional, physical, and people-to-people connectivity. The necessary policy modes will be changed according to the level of unbundling.

Table 3-1. Policies Required for Unbundling

	Pre-globalised world (0)	The first unbundling (1)	The second unbundling (2)	The third unbundling (3)
(i) International commercial policies (FTAs) and behind-the-border issues: Institutional connectivity		Trade liberalisation - GATT/WTO round negotiations - GSP	Trade liberalisation and facilitation - FTAs - Tariff removal - E-customs, TBT - Services (B2B) and investment liberalisation for GVCs	Trade liberalisation - Parcels and de minimis - Modes 3 and 4 in services (B2B, B2C, C2C) - (Cross-border) e-commerce and e-payments - Almost free flow of data Trade facilitation - SPS - Standards and conformance Backup policies and regulations - Consumer protection - Competition policy - Taxation - Cyber-security
(ii) Hard infrastructure and physical economic/living environment: Physical connectivity		Medium-grade connectivity - Road networks - Ports and airports Infrastructure services	High-grade connectivity - Full-scale port with container yard - Full-scale airport - Multi-modal (cargo, passenger) Urban/sub-urban development for industrial agglomeration - Logistics (highway system) - Mass economic infrastructure services (special economic zones/industrial estates, electricity, energy, water)	ICT connectivity - Internet connection - Integrating connectivity Metropolitan development and urban amenities (Glaeser et al., 2001) - Urban transport (LRT, subway, airport access, access to resorts) - Residential environment (children's education, medical services, safety) - Other urban amenities ("consumption")
(iii) Human aspects and inclusiveness: People-to-people connectivity	SME development - e.g., cottage industry	SME development - e.g., exporting primary products Human resource development - Primary and secondary education	SME development - e.g., supporting industry Human resource development - Managers, engineers	SME development - e.g., venture, start-ups Consumer (people)-centred policies - Consumer protection/privacy - Human resource development for innovation and new businesses - Movements of educated people - Avoid digital divide R&D capabilities and innovation hub

Source: Author.

The first row of the table is about institutional connectivity. The second unbundling requires overall tariff removals; trade facilitation; services liberalisation, particularly for B-to-B services; investment liberalisation in manufacturing and related services; and others. For the digital economy and the coming third unbundling, the consumer-oriented liberalisation of goods and services and rule-making for the free flow of data are going to be

crucial. In short, a high-level, modern free trade agreement is needed between Japan and Indonesia, and possibly together with other countries.

One idea is to review the Indonesia–Japan Economic Partnership Agreement and seek the possibility of upgrading the agreement. Another is to cooperate for the early conclusion of the Regional Comprehensive Economic Partnership, which is essential for maintaining ASEAN centrality, and set up continuous discussions for deeper economic integration. Also, if Indonesia wishes to do so, Japan would be happy to facilitate the accession of Indonesia to the Comprehensive and Progressive Agreement for Trans-Pacific Partnership. In any case, international rule-making for e-commerce and data flows may advance quickly in the coming few years. Both countries should not be left out of the world trend on this issue.

The second is on physical connectivity. For the second unbundling, the time-sensitive operation of production networks must be guaranteed. In addition, the formation of efficient industrial agglomeration is important. It is thus natural to invest in the Jakarta Metropolitan Area in order to fully utilise the mechanics of the second unbundling. Infrastructure for industrialisation in other parts of Indonesia would also be a possibility for future cooperation. For the digital economy and the third unbundling, the acceleration of digital connectivity is an urgent issue. Furthermore, urban amenities for attracting high-level human capital, as claimed by Glaeser, Kolko, and Saiz (2001) in the context of competition amongst cities in the United States, will become important because human resources for innovation are going to become increasingly more mobile.

The long-lasting official development assistance programme has continuously supported infrastructure development, mainly for the second unbundling. Other official funds have also played an important role in supporting infrastructure services, such as electricity generation. Japan and Indonesia can extend their cooperation for the necessary infrastructure development.

The third is on people-to-people connectivity. For the second unbundling, the shortage of managers and engineers is chronic. We may still need cooperation on human resource development for the manufacturing sector. For the digital economy, the technological gap between Japan and Indonesia may not be very large. It may be important to set up

meaningful opportunities for Japanese and Indonesian young entrepreneurs and computer engineers to get together.

Japan and Indonesia should lead the whole of East Asia in building up a new international commercial policy regime and utilising the upgraded value chains in the new digital era.

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Challenge 4

Strengthening Indonesia–Japan Cooperation in the Infrastructure Sector for Mutual Benefit

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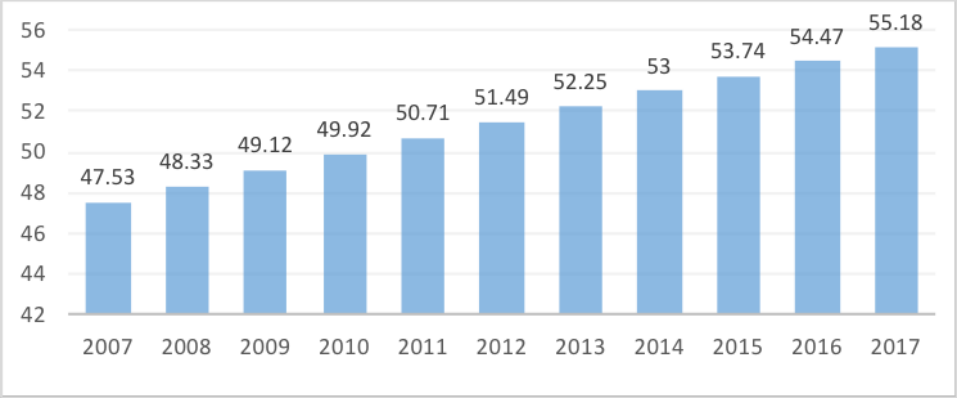
Part 1. Physical Infrastructure Development

Background

As Indonesia is constantly growing, the size of its population and economic activities is also expanding. To support its goals as a developed economy, the country needs a sufficient supply of infrastructure. The demand for infrastructure ranges from basic infrastructure and infrastructure for fulfilling human basic needs, such as electricity, water, sanitation systems, and transportation access; to more advanced facilities, such as integrated transportation systems, Internet facilities, flood control systems, and high-speed trains. Moreover, the rapid urbanisation rate implies a continuously increasing demand for urban infrastructure. As shown in Figure 4-1, the share of people living in urban areas has increased steadily over the last 10 years. Official projections estimate that in 2045, the urban population will reach 72.9% of the total Indonesian population (BPS, 2018).

Figure 4-1. Share of the Urban Population in Indonesia's Total Population, 2007–2017

(%)



Source: World Bank (2018).

As in many emerging economies, Indonesia's spending on infrastructure is constrained by limited resources in terms of fiscal capacity, human resources, and knowledge capability. Government spending on infrastructure competes with other equally important spending programmes, such as those for the social, health, and education sectors. Further, the current state of the financial and capital markets also limits the options for various financing modalities. Public–private partnerships (PPPs) have been promoted to fill the financing gaps left by the public and state-owned enterprise (SOE) capacity. However, the implementation is still limited, and, hence, there is room for improvement.

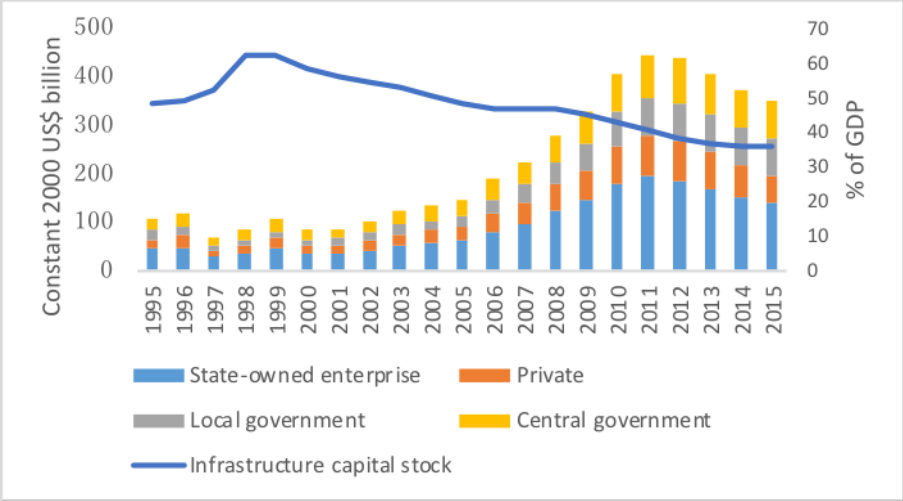
On the other hand, Japan is ahead in its economic development and has extensive experience and a high-innovation culture, especially in its infrastructure sector, which is known for its high quality. As a country characterised by a high risk of natural disaster, Japan has tackled disaster threats with a sophisticated mitigation and response system. Indonesia can also learn from Japan's disaster resilience since it, too, faces high natural disaster risks.

Potential Areas for Cooperation

Indonesia and Japan have been cementing their relationship in development for a long time, and the infrastructure sector has been important in this role. The relationship allows

bilateral cooperation to be more intensive and mutually beneficial. However, there are various challenges to infrastructure development in Indonesia (Figure 4-2). The first challenge is the lack of public funds for filling the infrastructure gap. This is a common problem in emerging economies where demand exceeds supply.

Figure 4-2. Infrastructure Stock in Indonesia, 1995–2015



GDP = gross domestic product.

Note: Capital stock estimated using the perpetual inventory method, assuming a 5% depreciation rate.

Source: Australia Indonesia Partnership for Economic Governance (2017).

Second, as a very large archipelagic country with an uneven population distribution, there is a lack of economies of scale in remote areas. This is a current challenge that will lead to inevitable demand as the country grows. To support its growing economy and the redistribution of growth centres, the country needs adequate infrastructure on all islands and connections between eastern Indonesia and other parts of Indonesia and with international hubs.

Third, Indonesia needs a long-term infrastructure development system to reduce inefficiency, accumulate sufficient knowledge, and anticipate future needs. The current system is still not comprehensive. For example, it lacks interdepartmental and cross-government tiers for coherent policy coordination, capacity-building at all levels across divisions (finance, design, operations and management, investment planning, etc.),

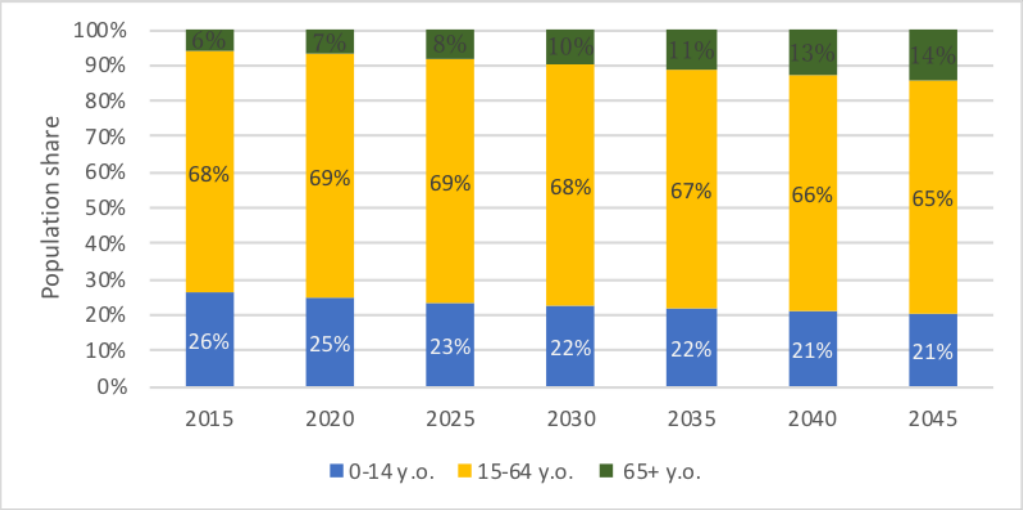
and a long-term investment plan. Urban amenities are an important form of infrastructure for Indonesia. Additionally, the current state of financial and capital markets limits the options for various financing modalities, including private sector financing.

At the same time, Japan has achieved a mature level of infrastructure development, characterised by the application of sophisticated technology and innovation, investment for future needs, and expansion to the worldwide market. The current and future focus of infrastructure centres on quality infrastructure, which, in short, can be represented by four dimensions: cost; the institutional dimension; delivery and utilisation; and the impacts. Quality infrastructure is an attempt to develop sustainable infrastructure through the most efficient forms of funding and procurement and deliver the optimal output for maximising the impact on society's welfare. It is about allocating the resources for efficient spending, building the framework for governing and managing the system, and creating environmentally friendly infrastructure with long-term, human-centred development objectives.

An additional issue related to the potential cooperation between the two countries is the demographic differences in the labour markets, as illustrated in Figure 4-3 and Figure 4-4. Japan faces a labour shortage, especially in non-high-skilled workers, while Indonesia will still have a young demography for the decades ahead. This situation brings several opportunities for cooperation, including capacity-building and knowledge transfer, support for Indonesia's transformation to innovative projects, financing cooperation, and easing of the labour market shortage in Japan.

Japan's labour shortage problem will not disappear soon because of the country's demographic profile and immigration policy. Changing the shape of the population pyramid in Japan will take a long time. Hence, a more relaxed immigration policy may become an effective way to respond to the labour shortage problem. If a long-term, flexible immigration policy is not an option, then Japan can opt for inviting short-term foreign workers through specific programmes. This could be related to Indonesia's technological capacity-building in infrastructure.

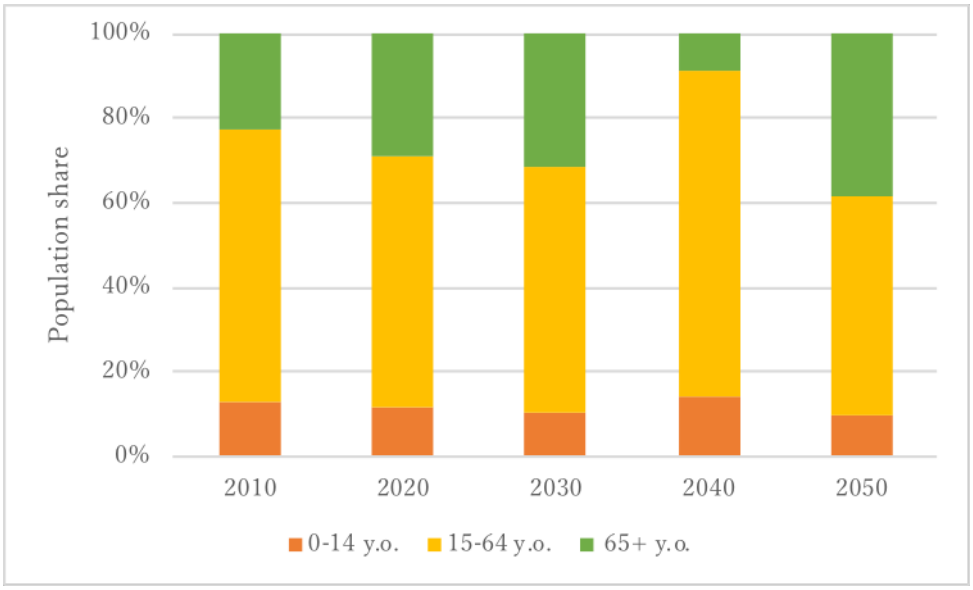
Figure 4-3. Indonesia's Demographic Profile Projection, 2015–2045



y.o. = years old.

Source: National Bureau of Statistics, Republic of Indonesia (2018).

Figure 4-4. Japan's Demographic Profile Projection, 2010–2050



y.o. = years old.

Source: Ministry of Internal Affairs and Communication (2018),

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Vision of the Infrastructure Sector and Indonesia–Japan Cooperation in 2045

Indonesia has a vision of adequate sustainable infrastructure, especially in the form of modern urban infrastructure and domestic and global physical and digital connections with sufficient and clean energy supplies. Japan is an important partner for achieving this vision, and both countries can commit to strengthening their cooperation based on the principles of mutual respect and benefit.

Opportunities and Challenges

There are several areas with significant opportunities for future cooperation, mainly centring on the issue of establishing a well-functioning infrastructure development system. This is about creating a system that enables effective and efficient resource mobilisation to finance quality infrastructure.

As previously mentioned, some issues on the Indonesian side are the lack of financing capacity, economies of scale outside the main islands, and a comprehensive and smart system to improve the productivity and efficiency of infrastructure. Japan can offer potential opportunities in its bilateral partnership with Indonesia, especially in the following areas:

- Quality infrastructure can be developed that is sustainable, disaster resilient, and efficient, especially for large-scale nationwide hubs and urban infrastructure. Environmental infrastructure is equally important, especially infrastructure that is related with the welfare status and in line with the Sustainable Development Goals (SDGs), specifically in water and sanitation, solid waste management, and clean energy.
- A strategic infrastructure investment system can enable efficient, transparent, and accountable interactions amongst infrastructure market players, particularly governments, investors and financiers, design and build (construction) companies, and advisors.
- A reliable and efficient logistics market can facilitate trade, production networks, and market integration. This is related to prioritising the right infrastructure projects to upgrade productivity. An improved logistics market will also create new

growth centres outside Java Island, which will address the economies of scale problems.

Key Reforms for Quality Infrastructure

1. Cost

a. For infrastructure needed for long-term use, the model should be based on a life-cycle cost policy, not a lowest installed cost policy.

b. Consideration of the opportunity cost should be transformed into a pipeline consisting of prioritised projects.

c. Resource mobilisation should be performed in integrated ways with an appropriate approach. At the subnational level and facing limited resources, one way is to use collective investment vehicles, where several small and eligible subnational governments can issue collective securities under a kind of regional development bank. At the macro level, the modernisation of the taxation system, including climate adaptation funding, tax incentives to attract private participation, and the utilisation of sovereign funds, has the potential for elaboration. In some subsystems, such as PPP schemes and SOE finance, applying non-conventional financial instruments (including the 'value capture' approach) and various forms of fiscal support merits consideration.

2. Delivery and utilisation

a. Safety and resilience. This relates to developing and choosing the appropriate techniques and specifications to provide safe facilities and resilience from disaster risks.

b. Standards and conformance. Standards can be established for long-term utilisation and expansion. Resources could be saved by applying anticipative specifications ready for upgrading in the future.

c. Output-based measures. These measures guarantee that spending corresponds with the output, not the input. This is a way to improve the efficiency and effectiveness of a project.

d. Sustainability. A sustainable project is a project that can function as designed for the whole life cycle without creating a negative impact on the environment.

e. Service excellence. Not only will service excellence improve user satisfaction and attract more users but it will also reduce the costs of inefficiency, such as time wasted, accidents, complaints, and compensation costs.

3. Impacts

The most important impacts to be assessed are the socio-economic and environmental effects. Assessments should be conducted before the decision to buy a project is made, and they should be regularly evaluated at certain periods.

4. The institutional dimension

a. The development infrastructure market. A complete and functional infrastructure market will serve the players with the lowest transactional costs and accumulative knowledge. Nurturing the market is a long-term effort that should be well planned by the government.

b. Capacity-building and knowledge transfer. Cooperation between Indonesia and Japan is expected to create knowledge transfer in developing the system, technology and innovation, maintenance, and improvement. The programs start from the college level with internships in Japan before employment back in Indonesia.

Urban Infrastructure and the Logistics Market

In rapidly urbanised areas, city planning should be farsighted. The lessons have been seen all over the world where a city has been late in responding to increasing demand for urban infrastructure. Jakarta is one such example, where an integrated mass transportation system was supposed to be built decades ago before the current problems of mobility surged. Other critical urban infrastructure is water and sewerage systems, solid waste management, clean energy, flood control, disaster resilience, and urban amenities, such as parks and green belts, pedestrian walks, and river bank management. Indonesia and Japan's cooperation in environmental infrastructure, such as for river conservation and the

reduction of flood risks, has been running since the 1970s, and we expect it to continue to scale up.

The logistics market deals with interactions between the economic infrastructure and the institutional setup to run an efficient and effective supply chain system. It consists of interconnected subsystems, including identification systems, order systems, transport systems, inventory systems, cost control and distribution, tracking and tracing, and billing systems. Typically, these subsystems are regulated under their respective sectoral laws and are, hence, complex. At the same time, digitalisation in the logistics market has been growing widely and is replacing the traditional paper-based system. It cuts costs and time and improves reliability. This is an opportunity to integrate all subsystems into an intelligent logistics system. Nonetheless, as other disruptive technologies, digital logistics will create both positive effects on welfare and uncertain effects for replaceable workers and technology developers. Policymakers are required to be agile and visionary to deal with disruptive technology.

Japan has revised and enacted relevant regulations regarding the freight forwarding business to accommodate structural shifts in the logistics market (from heavy industry to soft industry) and to utilise multimodal transportation. The World Bank's 2018 Logistics Performance Index (LPI) report puts Japan (ranked fifth) and Singapore (ranked seventh) as the only two Asian economies amongst the top 10 LPI economies. The other eight countries are from Europe. Indonesia can learn from Japan's experience through its investment, capacity-building, and business-to-business cooperation in the logistics market.

The logistics system is closely influenced by connectivity with the hinterland. Indonesia is still struggling with creating sustainable domestic maritime connectivity because of the uneven distribution of economic centres amongst its islands. In a globalised economy, trade means international shipping. The trend in the world shipping market is for having bigger fleets and fewer players. In Southeast Asia, only Malaysia and Singapore have a strong liner shipping connectivity bilateral index with East Asian economies (China, Hong Kong, India, Japan, and the Republic of Korea), several European Union member states, the United Arab Emirates, the United Kingdom, and the US. Other ports in Indonesia, the Philippines, and Thailand have weaker connectivity with the world, except for Singapore.

This shows that Singapore plays an important role as a regional hub.

The East Asia region needs a more intensive and larger regional shipping market that can utilise mid-size fleets to distribute and feed the big vessels in certain ports in the region. Currently, Singapore port, Port Kelang, and Tanjung Pelepas in Malaysia serve as the main players. There is also an opportunity for a few other ports, such as Port Kuala Tanjung (North Sumatra). Other smaller ports in the Philippines and eastern Indonesia can become the second hubs. India and the subregions of Southeast Asia can enhance the maritime trade route by connecting the ports in Bengal Bay with the Port of Sabang (western Indonesia). The shipping route can be extended to ports in Java Island, central and eastern Indonesia, the Philippines, and to the north, especially to Japan and the Republic of Korea. Since the principle of international law and sea is 'freedom of the seas', the route from Port of Sabang can pass through the Indian Ocean at the Sumatra west coast instead of through the Malacca Strait, which is already very crowded and not so safe.

Trade relations between Indonesia and Japan are expected to increase over time, increasing the possibility of having direct shipping connections between the two countries to facilitate timeliness and save on time and costs, as well as induce more trade. Japan can become an important partner for Indonesia, particularly through the following actions: (i) developing new shipping route from India to Indonesia and Japan (partnerships with India and perhaps the Philippines), (ii) investing in the development of Indonesia's ports, especially in eastern hubs, (iii) engaging as a special investment and trading partner in fisheries and other sea products (seaweed, pearls, etc.), and (iv) ensuring regional maritime security cooperation.

Part 2. Financing Infrastructure Development

Closing the infrastructure gap will help improve the productivity of the Indonesian economy, and, most importantly, it will also help promote economic growth to be more inclusive. The lack of infrastructure investment since the Asian crises – amid a large chunk of government spending being allocated to unproductive fuel subsidies that are biased toward Java and Jakarta – has created a big infrastructure gap that has constrained economic growth and limited the pace of poverty reduction. Indonesia's annual rate of growth in its public capital

stock per capita – a proxy for infrastructure stock – averaged only 2.8% during 2005–2015, well behind its peers, such as Viet Nam (10.3%) and China (6.7%), according to the World Bank (2018). Productivity gains can be achieved with higher and suitable infrastructure investments, which may bring down the logistics costs, especially with the vast archipelagic nature of the landscape.

Furthermore, better infrastructure that provides basic social services, such as sanitation and clean water, and health and education, will help poorer households access a wider range of economic opportunities to improve their well-being.

The Indonesia Vision 2045 foresees Indonesia to have a relatively high economic growth scenario, with equitable and inclusive development that will trigger urbanisation and the growth of small and middle-sized cities. In 2035, almost 90% of the population in Java will live in the cities, concentrated in Jakarta–Bandung, which may create a mega-urban area, and this will require a different kind of infrastructure and, thus, also financing.

A shallow financial sector with banking sector dominance in Indonesia has put a rather hard constraint on efforts to close the large infrastructure gap. Despite the recently increasing role of capital market financing for infrastructure, the combined local banking and capital markets in Indonesia are still too small to fully finance the infrastructure needs, according to the World Bank's (2018) assessment. The fact that the banking sector only issues short tenor (less than five years) has limited its ability to finance long-term assets. Despite making some progress on the financial market front, i.e. raising the shares of equity market capitalisation and bond market outstanding values as a percentage of GDP, Indonesia still lags its emerging market peers in financial market depth.

On the other hand, the domestic institutional investors, such as pension funds, insurance companies, and mutual funds, are relatively too small (in asset volume) to play a significant financing role for infrastructure in the longer run. The penetration of insurance and mutual funds in Indonesia is significantly lower than in other peer countries. In order to enlarge the pool of long-term savings mobilised by institutional investors, reforms are necessary. The practice of early withdrawal of the Workers Social Security Agency (BPJS Ketenagakerjaan) employment benefits (Jaminan Hari Tua) and the short-term behaviour of domestic institutional investors of putting money in just short-term bank deposits need to be

changed, an issue which was addressed by Otoritas Jasa Keuangan (Indonesia's financial services authority) in 2016. Furthermore, the retirement system should be reformed to ensure the compatibility of the pension and social security systems (World Bank, 2018).

The limitation of government sources of funds for taking full control of financing infrastructure development and the inadequate domestic financial sector (characterised by banking sector domination and the lack of long-term institutional investors) have lead us to search for alternative (and innovative) financing for supporting infrastructure development, especially through private sector financing in the current environment and also towards the year 2045, when infrastructure needs and the type of financing may have changed.

There are three approaches to attracting private infrastructure financing in the current environment (and most likely up to the 2030s as well). These are (i) risk reduction; (ii) returns enhancement and new types of alternative financing beyond the usual PPP schemes or government and official development financing; and (iii) improvement in the market infrastructure, which can be viewed as a process to deepen the financial sector, the results of which may also overlap with risk reduction.

The government has carried out several reforms to reduce the risks, including for the private sector, and help speed up the implementation of infrastructure development. The three pillars of reforms that have been taken by the government include: (i) fiscal reforms and fiscal incentives, such as (but not limited to) providing viability gap funding to improve infrastructure project financial feasibility and setting up land revolving funds; (ii) establishing six main institutions to coordinate and speed up infrastructure development, including the KPPIP (the Committee for Acceleration of Priority Infrastructure Delivery), PT Sarana Multi Infrastruktur (providing funding for infrastructure projects), and Indonesia Infrastructure Guarantee Funds (providing guarantees to well-structured PPPs and ring-fence government contingent liabilities and, thus, protecting the state budget PPP unit and helping the government contracting agency to prepare PPP projects and the State Asset Management Authority to provide land funds for National Strategic Projects); (iii) regulatory reforms that help speed up infrastructure project implementation, e.g. the Law and Government Regulations concerning the land acquisition and compensation payments for affected people.

*The emergence of 'new and innovative' types of infrastructure financing thro*ugh capital markets in the last two to three years despite, once again, the dominance of bank financing has sped up the implementation of infrastructure projects in Indonesia. The efforts for deepening financial markets to create alternative infrastructure financing instruments have been tremendous. Banks working together with investment banking and securities company arms and other financial institutions are creating new innovative capital market instruments for infrastructure financing and protection against currency risks (hedging instruments). These types of financing instruments are very relevant today and may still be relevant and feasible in the next two decades. An example is the financial market instruments issued by SOEs, which are mandated and responsible for building the infrastructure. These include asset-backed securitisation (KIK EBA), limited mutual funds (RDPT), real estate investment funds (DIRE), infrastructure investment funds (DINFRA), Komodo bonds, call spread options, and domestic non-deliverable forwards (DNDF). The last two instruments are for hedging protection. Some others, such as perpetual bonds, municipal bonds, and asset recycling schemes, are still in the pipeline or being prepared.

The issuance of many new financial instruments, being steps closer towards deeper financial markets, was made possible by extra efforts by the government and authorities to carry out reforms, especially tax reforms to avoid double taxation on collective investment contracts. However, the tax policy on bonds and equity investment has still not changed, and no incentive has been extended. One precautionary note with respect to the issuance of Komodo bonds is that they can possibly bring higher risks to the currency as the foreign ownership of liquid local financial instruments is becoming higher.

Despite the fact that Indonesia's financial sectors are still shallow, many indicators of financial deepening have been improved, except the ones with regard to the ratio of foreign-to-local ownership in bonds and equity. The lack of a more comprehensive and independent Credit Bureau, besides the one which has previously been established by Bank Indonesia, hinders risk identification. Indonesia has for some time made preparations to establish the first private sector-led, independent credit bureau, which may be launched next year.

Private sector participation, as a source of funding and also as the implementing agency, can help deliver infrastructure projects faster, with better value for money than traditional

government procurement and with improved operational efficiency and a higher quality of service to end-users (World Bank, 2018). Constraints hindering private investments include the complex legal landscape for PPPs, the lack of a standardised process for project identification and preparation, difficulty in accessing local currency financing, a lack of commercial viability, and insufficient government funding to fill the viability gap.

Therefore, more recently, the government has given SOEs more significant roles in infrastructure by assigning projects to them, often with capital injections or government guarantees. The World Bank also sees that SOEs could deliver on infrastructure priorities more quickly, display a higher tolerance to regulatory and financial risks, and be more willing and able to take on commercially non-viable projects as their developmental mandates; although, some of them are still less-professionally run and lack good corporate governance practices. Thus, there is an urgent need to enhance governance practices in order to improve the performance, transparency, and accountability of SOEs and to strengthen their ability to develop projects jointly with the private sector. Very recently, on 9 October 2018, an open investment forum in Bali attracted the interests of many private investors to take part in several infrastructure projects to be jointly run with SOEs.

There is one other thing outside the scope of, but still very relevant to, the infrastructure financing mentioned by Garemo et al. (2015). This is that there are three ways to boost infrastructure productivity: (i) improve project selection by creating a rigorous, transparent, and fact-based process to decide what needs to be done and in what order, (ii) strengthen delivery, and (iii) make the most of existing investment (less underutilisation). By doing so correctly, global infrastructure productivity could be boosted by around US$1 trillion a year. Countries that take the time to get the planning right are able to eliminate non-economic projects and reduce project overruns in the projects they do launch.

Ideas for Cooperation with Japan

1. Spillover-effect-led fiscal incentives can enhance the returns for private investors (Yoshino, 2018). The basic idea is the government giving back part of the increased tax revenue generated by the positive economic development spillover effects of an infrastructure project in the region so that it can enhance the project return for investors. With this enhanced return, on top of the usual

user charges (for highways, railways, and water supply), investors become more attracted to invest in the infrastructure project. Efforts to increase the positive spillover effects on the local economy can be achieved with an accompanying programme to support small businesses in the local area, such as Home Investment Trust Funds, which are basically crowdfunding for small businesses in the area or near to the infrastructure project. There are two key components in this programme to enhance the returns to private investors: (i) the way the expected spillover effects on raising tax revenues are measured, and (ii) the method of part of the increased tax revenue to be given back to the infrastructure project. The latter component will be harder to implement in Indonesia without changing the existing law.

2. Can a model like that of Japan's postal savings system (Japan Post Bank) mobilise domestic funds to help finance future infrastructure projects despite the fact that Indonesia many years ago also had a savings programme through its post offices?
3. With the more open access of international and domestic private investors to partner with or jointly carry out infrastructure projects with Indonesia's infrastructure SOEs, and with the ongoing existence of Japan's Fiscal Investment and Loan Program (FILP), there is a possibility and the opportunity for Japanese overseas infrastructure companies to get financing through the FILP. Bilateral cooperation between Indonesia and Japan can push for greater involvement of those Japanese overseas infrastructure companies to access the FILP.
4. Municipal bonds can be developed for selected regions (Jakarta, West Java, and East Java). Japan ranks number two in the world (after the US) in the issuance of municipal bonds, and, thus, Indonesia can learn from Japan in developing its municipal bonds, especially in upgrading the quality of its local government capabilities.
5. The Indonesian government could make an agreement with the Japan Bank for International Cooperation, as in February 2009, to underwrite or support the issuance of the financial instruments (project bonds/Samurai bonds) issued by Indonesia's infrastructure companies in order to improve the instrument

ratings so that the financial instruments (project bonds) would be more attractive and could be accessed by the pool of Japanese investors.

6. Developing 'blended finance', defined as the strategic use of development finance and philanthropic funds to mobilise private capital flows to emerging and frontier economies, resulting in positive results for both investors and communities. Blended finance offers the possibility to scale-up commercial financing for developing countries and to channel such financing toward investments with development impacts within the context of the SDGs. The focus is on attracting Japanese philanthropists and the private sector together with Japanese development agencies to provide funds for Indonesia to achieve the SDGs, especially those related to infrastructure development. Indonesia's Ministry of Finance recently established SDG Indonesia One with PT Sarana Multi Infrastruktur (SMI) as the intermediary, partner, co-financier, fund manager, and implementing agency for infrastructure financing through blended finance. Thus far, PT SMI has been working together with JICA on local hospital projects.
7. The role of local governments should be explored for developing smart cities: developing the concept of sister cities with local governments in Japan, with an emphasis of developing environmentally friendly infrastructure in the cities and on using renewable energy as well.
8. Looking forward to 2045, we can expect a role for blockchain-based technology and other new fintech developments in financing infrastructure projects, especially considering the rapid increase in the use of digital technology in the financial sector. Japan, which is already at a more advanced stage of development, and particularly one related to the digital economy, may be a good source or partner in developing digital financing for infrastructure in the future (2045). Setting up a closed group of blockchains amongst the Indonesian and Japanese financial institutions, investors, and contractors of infrastructure projects would be a step towards the possible financing of infrastructure projects that is needed. Crowdfunding, which right now is relatively small in size, may become much larger in the future and, thus, may be sufficient for financing longer-term investments, such as infrastructure. The

benefit for investors in Japan would be the higher and safer returns of investment, especially when some kind of government guarantee is involved.

As we have shown, there are various opportunities for financing infrastructure projects and creating a business environment for attracting investment in infrastructure through cooperation between Indonesia and Japan.

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Challenge 5
Indonesia and Japan 2045:
Strengthening the Economy through Investment

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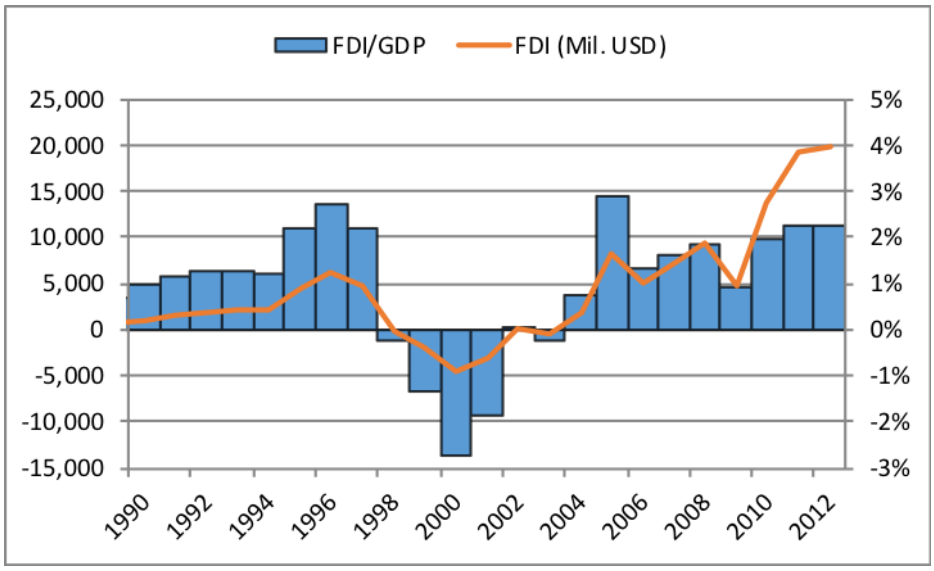
Introduction

The trend in foreign direct investment (FDI) inflows in Indonesia since 1990 shows several periods of ups and downs (Figure 5-1). In the early 1990s, Indonesia experienced booming labour-intensive industrialisation. One of the contributing factors was export-oriented FDI, which grew towards its peak in 1996. When the 1998 financial crisis hit Indonesia, investors drew back their capital. FDI reached its highest outflow in 2000, marking the most severe effect of the crisis along with the start of the reformation of the political regime in Indonesia.

Figure 5-1. Foreign Direct Investment Inflows in Indonesia, 1970–2012



FDI = foreign direct investment, GDP = gross domestic product, USD = US dollars.

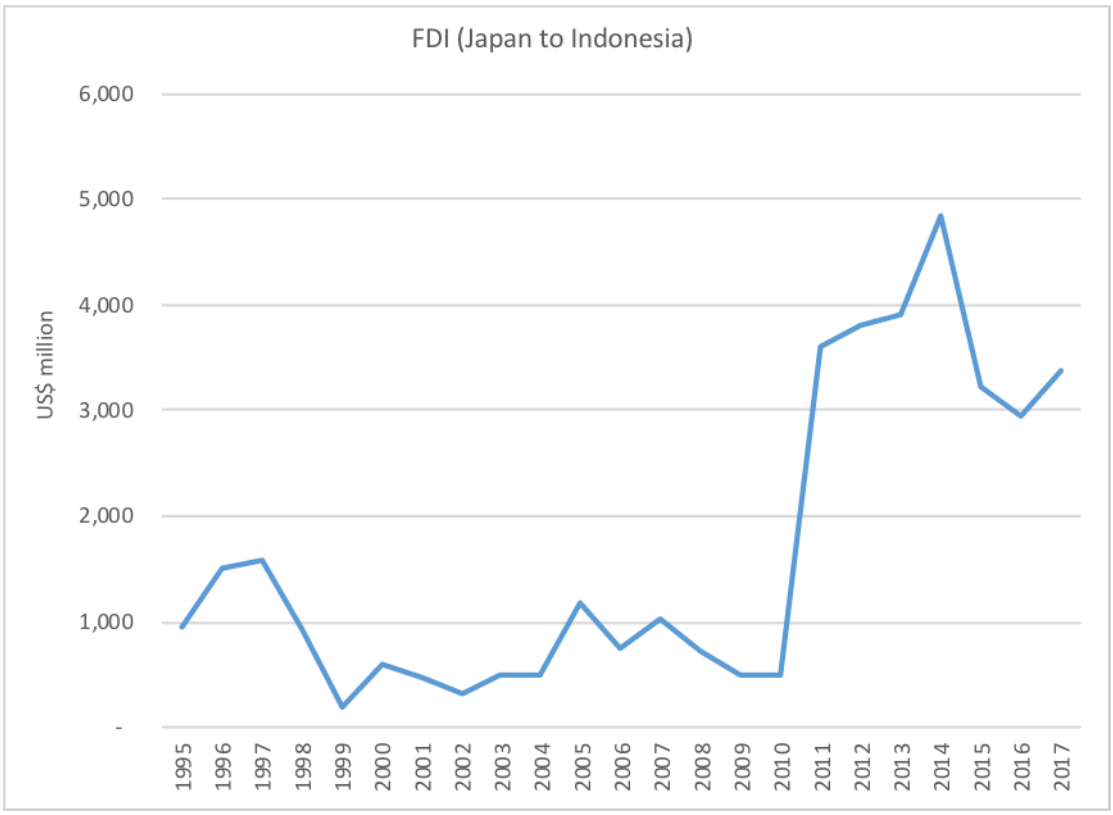
Notes: The left-hand axis shows FDI inflows measured in millions of US dollars (current prices). The right-hand axis shows the ratio of FDI to GDP as a percentage.

Sources: UNCTAD; World Development Index, World Bank.

Recovery after the 1998 crisis seemed to be slow, but FDI continued to rise until 2005 when the share of FDI to gross domestic product (GDP) surpassed its pre-crisis level. The legislation of a new investment law in 2007, followed by its derivative laws, marked the reformation of Indonesia's investment policy, which was expected to take effect afterwards.

The global financial crisis hit around 2008, leading to a slowdown in FDI inflows. However, from 2009, Indonesia experienced a massive jump in FDI, reaching double its 2008 value in 2011. As Figure 5-2 shows, much of this jump came from Japan. The share of FDI to GDP was steady, and the jump in the FDI value shows that while developed economies were hit by the global crisis, they (especially Japan) still maintained a substantial interest in Indonesia.

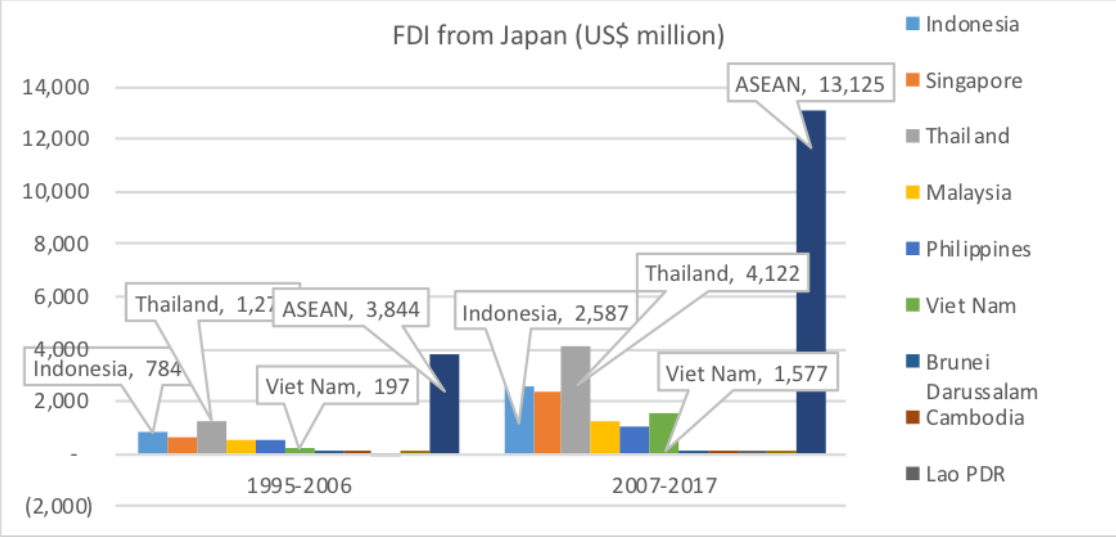
Figure 5-2. Trend in Foreign Direct Investment from Japan to Indonesia



Source: World Bank, World Development Indicators; JETRO; Bank of Japan.

Figure 5-3 shows that the relative position of Indonesia amongst the other major Association of Southeast Asian Nations (ASEAN) countries has not changed since the mid-1990s. Indonesia is still the second-largest recipient of FDI after Thailand. The amount of FDI in Indonesia has increased by around threefold in recent years compared to the earlier period of 1995–2006, but this is also a trend we observe in the other ASEAN countries. Thus, Japan's investment in the ASEAN region has increased significantly in the past decade after the 2008–2009 global financial crisis, and this may have been due to the much higher opportunities in the Southeast Asia region after the crisis relative to those in other parts of the world.

Figure 5-3. Foreign Direct Investment from Japan to Southeast Asia



ASEAN = Association of Southeast Asian Nations, FDI = foreign direct investment, Lao PDR = Lao People's Democratic Republic.

Source: JETRO; CEIC; Bank of Japan.

Brief History of Industrialisation in Japan

Japan is one of the leading industrialised countries in the modern world, and its industrialisation has a long history that began even before the Meiji Restoration of 1868. Some scholars have dated the country's industrialisation process back to the age of the

samurai, which began around the end of the 12th century, while the common view marks the Meiji Restoration as the cornerstone of Japan's modernisation and industrialisation. Nevertheless, industrialisation in Japan has been on a long journey, responding and reacting to every foreign force and influence it has been exposed to, shaping itself along the way, and transforming Japan into a respected industrialised economy.

The view that Japan's industrialisation began during the period of the samurai might not be far from the truth. After being shaken by two unsuccessful invasion attempts by the Mongolians in 1274 and 1281, the government ran out of land to distribute to the samurai who had fought the Mongolians, and long internal fights amongst the samurai leaders ensued. Despite the unstable politics, during that period, rice cultivations started to flourish throughout Japan. Active trade with China and Southeast Asia was also taking place. This agricultural production and trading culture would later play a crucial role in shaping Japan's economy and industry during the Edo period, which started in 1603 after Ieyasu Tokugawa unified Japan and settled a new government in Edo. This relatively stable period is now viewed as a dynamically evolving period, rather than a stagnant dark age, which provided Japan with the necessary and important conditions for industrialisation.

The Edo government is mainly known for its centralised political system and deliberate international isolation that lasted more than two centuries (1639–1854). However, the Edo period was also characterised by independent farmers who were critical towards government acts. Being mainly agriculture based with rice as its main commodity, Japan in the Edo period started with land expansion to increase production but soon realised the associated losses coming from overexpansion, such as floods and deforestation. The farmers gradually moved to land intensification instead, with the increased use of farming technology, such as traditional fertilisers and the double-cropping method. The surge in production stimulated the commercialisation of agricultural products and a flourishing of simple manufacturing products. As Japan was isolating itself from international trade and agricultural products had to be physically moved, a nationally unified transportation system was naturally developed, and the national market became integrated.

Japan's isolation from international trade was finally shaken by the arrival of four American military ships in 1853 led by Commodore Perry. The United States (US) demanded that Japan open itself to commercial relations and allow US ships to use Japan's ports. In 1858,

the Edo government unilaterally signed comprehensive commercial treaties with the major powers, including the US, without either imperial permission or national consensus. The signed treaties put Japan at a disadvantaged position against their Western commercial partners at face value. While not supported by the elites, the changes provided Japan with a larger market for its primary commodities, and its silk and tea found huge overseas markets for the first time. More importantly, it opened new ideas and horizons for the Japanese, who later absorbed foreign ideas and technology rapidly, partly out of fear of being colonised by foreign superpowers.

The internal political conflicts eventually culminated in civil war, and the Edo government was finally defeated in 1868. A new government was established, with the emperor being settled in Edo, which was renamed Tokyo, marking the beginning of the Meiji government era. The new government's priority quickly evolved from avoiding being colonised by the West to rapidly catching up with them and placing Japan in the same league as those colonisers – the Meiji government deemed this was the most effective way to survive and thrive in the new international dynamics they found themselves in.

As far as the industrialisation process is concerned, import substitution was the most prominent feature of Meiji policies. By the end of the Meiji era (1912), Japan was successfully industrialised in light industries, especially textiles. Embracing the newfound overseas market for its raw silk at the beginning of the Meiji period, Japan quickly learned how the US put itself in a more advantageous trading position by protecting its silk weaving industry while using Japanese silk yarn as the raw material. Japan also imported cotton clothes from the British and learned the necessary technology. Eventually, Japan gained an adequate competitive advantage against British textiles and drove them out of the Asian market.

The Meiji government was aggressive in its import substitution and Western technology absorption efforts. They sent a high-level official delegation and students to the US to renegotiate the unequal treaties and to study Western technology and systems. Despite an unsuccessful initial attempt to renegotiate the treaties, the mission brought back important insights that gave birth to pivotal policies and movements in Japan's industrialisation. Returning to Japan, the Japanese Finance Minister at the time, Toshimichi Okubo, vigorously promoted industrialisation by hiring foreign advisors, hosting domestic industrial

fairs, and constructing railroads and roads, amongst other industrialisation-oriented policies. Gradually, the import substitution moves also began to include human resources, starting with paying high salaries to foreign experts and engineers before eventually shifting to generating strongly capable Japanese engineers to lead the industrialisation process. In addition, the Meiji government was also very careful not to let important national projects, such as mines and infrastructure, fall into foreign hands through debt or other means. All these policy characteristics also caused the Meiji period to be known as the translative adaptation period (Maegawa, 1998).

The rapid Westernisation of Japanese society took place during the Meiji period and mainly comprised the revision of the unequal treaties with the West. Japan's diplomacy during the Meiji period perceived this as a necessary condition for joining the ranks of first-class countries and, thus, putting Japan in a more equal position with the West. Tariff rights were finally restored in 1911, and court rights were regained in steps during 1894–1899. In terms of the direct foreign influence on the economy, the contribution of foreign savings to industrialisation was relatively small during the Meiji period, and almost all necessary funds were raised domestically. Japan in the Meiji period did not welcome FDI or foreign loans for industrialisation, except for public sector borrowing in the late Meiji period for war purposes. In general, FDI inflows remained negligible in terms of both the establishment of enterprises and stock purchases by foreigners during the Meiji period.

Entering the 20th century, World War I (WW1) erupted and affected many countries, including Japan. As the major European powers fought each other, their international trade was suspended and gave way to Japan to fill the global trade gap. Japan suddenly enjoyed an enormous export-led boom in all sectors, especially marine transportation and shipbuilding. Between 1913 and 1919, the industries with the highest output growth included the machinery, steel, chemicals, and textiles industries. These industries maintained strong growth despite the recession in the 1920s, and by the 1930s, Japan could finally produce most machinery domestically.

When WW1 ended in 1918, small businesses in Japan experienced setbacks as their exports halted, which led to a big economic crash in 1920 when the post-war recession took its toll on Japan. Japan's government reacted by rescuing weakened industries and banks saddled with bad debt while trying to strengthen more peaceful international relationships with

other countries. However, these recovery attempts and peaceful diplomacy were abruptly cut by Japan's invasion of Manchuria in 1931. These military moves eventually put Japan in a total state of war, which lasted for years with expanded opponents, and all economic efforts had to be reorganised for war.

During the wartime, the growing light industries in Japan were strongly suppressed, and the once-booming textile industry was virtually eliminated. Japan focused its resources on key military products, such as ships and warplanes, which gave a boost to heavy industries. However, Japan soon found itself deficient in the raw materials and energy sources needed for supporting the military industry. It then began to invade Southeast Asia with its eyes on their raw materials and energy sources while being at war with the US, which was building an increasing number of ships and planes. The US eventually forced Japan to surrender after dropping atomic bombs on the Japanese cities of Hiroshima and Nagasaki in 1945.

In 1946, a document called 'The Basic Problems of Japan's Economic Reconstruction' by Saburo Okita and Yonosuke Goto[1] was published, giving insights into Japan's quick recovery. Japan realised that it could no longer rely on agricultural products and textiles as the rest of Asian would soon gain better competitive advantages in those sectors. It began, instead, to focus on skilled labour-intensive industries, and it has continued to do so ever since. Under the restricted import regulations imposed on Japan by the US at the time, Japan decided to import steel, coal, heavy oil, rubber, and buses to self-generate the energy sources needed to reconstruct the whole industry (Ohno, 2006). The Ministry of International Trade and Industry was created in 1949 (later renamed the Ministry of Economy, Trade, and Industry in 2001) to revive Japan's industrialisation boom, but in industries with higher value added as the country already possessed the necessary know-how and a strong foundation in technology-based industry. These strategic movements, along with a tight and disciplined fiscal regime, stopped the post-war inflation and eventually allowed Japan to enter a high-growth period from the mid-1950s. In doing so, the country was launched into the ranks of the leading industrialised economies.

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[1] An English translation of this report is now available. S. Okita (ed.) (1992), Postwar Reconstruction of the Japanese Economy. University of Tokyo Press.

The Future of FDI from Japan to Indonesia

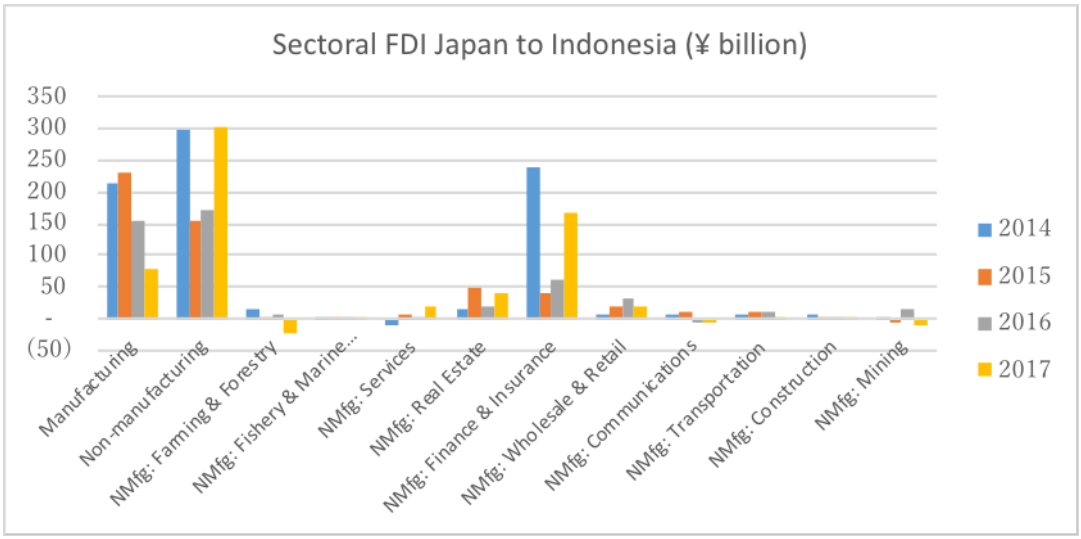
The description of the brief history of industrialisation in Japan tells us that indeed it takes time for a country to build a strong industry. Japan started its industrialisation in the early 19th century. Another insight we can learn is that focusing on demand can provide a path to industrial development in a country. Also, technological development is both naturally embedded in the process and constantly needed for upgrading, and innovation is necessary to promote a unique country-specific competitiveness.

What, then, can Indonesia expect from Japan in terms of direct investment and the fostering of a much closer bilateral relationship with Indonesia in the future or by 2045 when Indonesia will celebrate 100 years of independence? The following are some ideas for answering this question.

Indonesia could expect increased and more evenly distributed direct investment from Japan. As Figures 5-4 and 5-5 show, FDI from Japan to Indonesia has been distributed to only a few sectors in the Indonesian economy, with a tendency for growing FDI in services. The picture for the overall economy is mixed. Figure 4 shows that FDI to non-manufacturing increased in the past five years or so, while this was not the case for FDI in manufacturing. The declining FDI for manufacturing is disappointing from the perspective of Indonesia and clearly is an issue the two countries, especially Indonesia, need to resolve.

A similar picture can be seen for FDI in manufacturing. Figure 5-5 shows a very unequal distribution of investment in Indonesian manufacturing. The investment is mostly directed to industries in the transport sector, with small amounts going to the chemical, electronics, and machinery industries. It is worth noting that, as others have also documented, FDI from Japan to the Indonesian automotive sector is one success story for Indonesia. The deeply rooted presence of Japanese automakers in Indonesia, Toyota especially, has brought the industry to the level of an internationally competitive sector, marked by the ability of the sector to provide significant manufacturing export revenues.

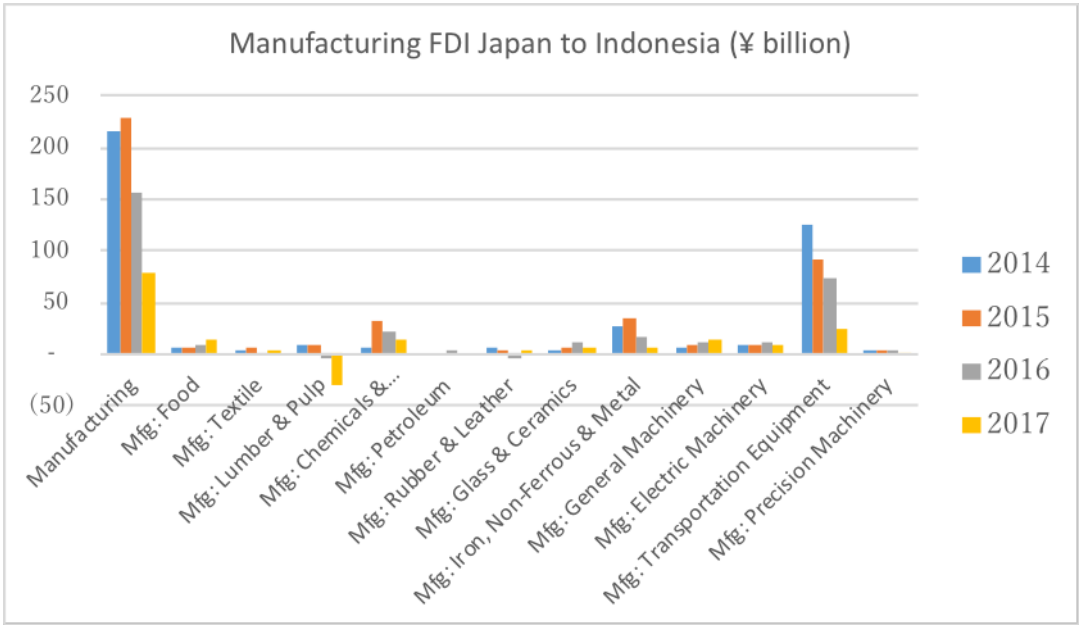
Figure 5-4. Distribution of Foreign Direct Investment from Japan to Indonesia



FDI = foreign direct investment, NMfg = Non-manufacturing.

Source: CEIC; Bank of Japan.

Figure 5-5. Distribution of Foreign Direct Investment from Japan to Indonesia in Manufacturing



FDI = foreign direct investment, Mfg = Manufacturing.

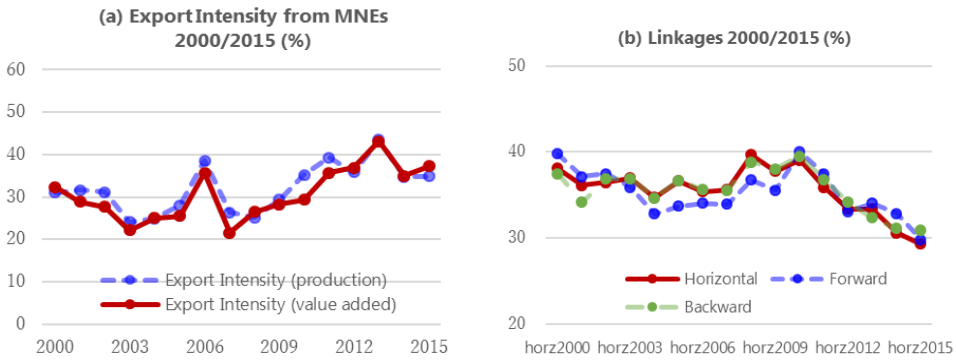
Source: CEIC; Bank of Japan.

Embedded in the idea of increasing FDI from Japan to many other sectors is the

expectation of more specific FDI to support the idea of increased digital production, e.g. the implementation of Industry Revolution 4.0 and the increased participation of Indonesian manufacturing in global value chains (GVCs), two important characteristics for today's global manufacturing operations and those in the future.

Regarding GVCs, at this moment, there is an indication of a growing 'disconnection' between domestic industries and the operations of multinational enterprises (MNEs) in Indonesian manufacturing. Figure 6 shows this. On the one hand, the exports of MNEs in the country have increased significantly since 2009 (Figure 5-6a), but, on the other hand, the linkages from the MNEs to other sectors (i.e. backward and forward linkages) have declined substantially within the same period (Figure 5-6b). This reflects some disconnection between MNEs and domestic firms, which means that MNE-led GVCs so far have not really engaged domestic manufacturers.

Figure 5-6. Exports and Linkages of MNEs in Indonesian Manufacturing



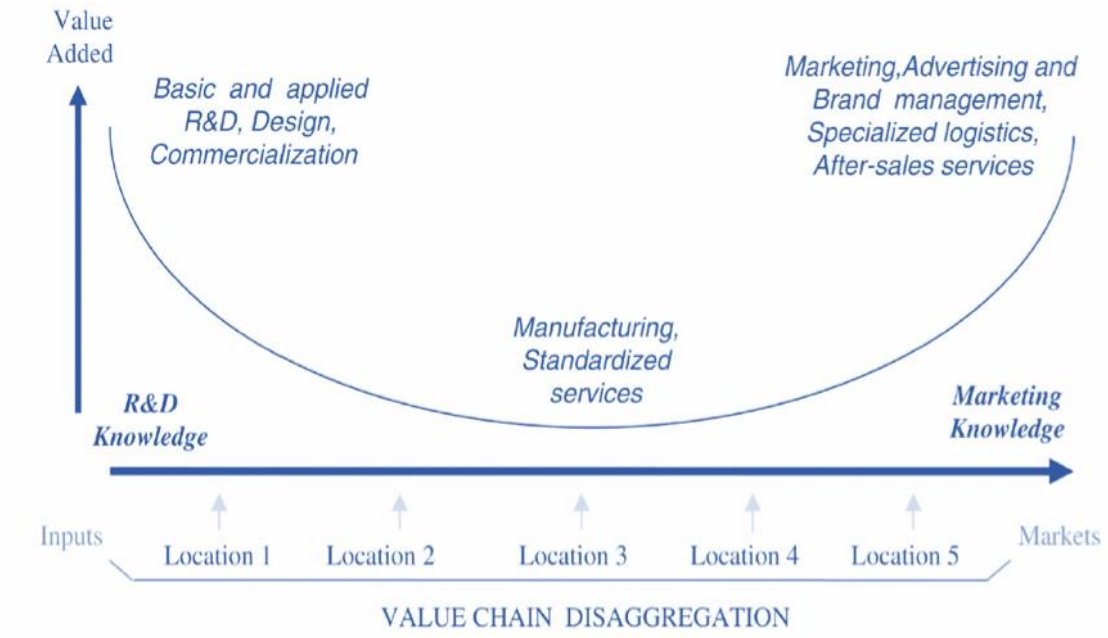
MNE = multinational enterprise.

Source: Statistik Industri Manufaktur Besar dan Sedang; own calculations.

Implicit in the discussion of the idea above is the expectation to see much higher and widespread FDI from Japan not merely in terms of quantity. Expectations of the specific type of FDI from Japan pertain to quality. That is, the FDI is expected to be of high quality in the sense that it could bring the adoption of more advanced technology. Included in this way of thinking is high-quality FDI in the services sector, which is expected to boost the capability of the services sector in Indonesia and, in turn, facilitate the greater and deeper participation of Indonesia in GVCs. More advanced GVCs integrate production stages from

being only purely networks of manufacturing production to also cover the services elements of manufacturing processes, as depicted in the so-called 'smiley curve' presented in Figure 5-7.

Figure 5-7. Smiley Curve: The Integrated Manufacturing Production Process



R&D = research and development.

Increased FDI from Japan in the longer term could hopefully increase the exporting capabilities of all Indonesian manufacturing firms, including and especially domestic firms. This is because given some period of time, high-quality FDI could significantly increase the technological adoption of domestic producers, which is required in order to achieve the quality of products that can compete in export markets.

Higher quality FDI, however, may not easily flow into Indonesia without greater cooperation between the two countries. Cooperation is necessary in addition to the business motives because there are many requirements for Indonesian firms to be able to capitalise on the much higher quality FDI from Japan. The capitalisation of high-quality FDI requires the availability of professionals, engineers, and other skilled workers that are able to work with the advanced technology brought by the FDI. Also, R&D infrastructure,

such as laboratories and testing facilities, are a must if Indonesian firms are to maximise the potential benefits from the FDI. Indonesia, therefore, needs to ensure the availability of all these before the high-quality FDI enters Indonesia.

In addition, because the nature of modern manufacturing involves a lot of value added from the services sector, Indonesia also needs to conduct reforms to allow the greater participation of foreign services providers.

There is, then, further room, or opportunity, for expanding and intensifying cooperation between Japan and Indonesia in this context. More explicitly, the two countries may devise cooperation mechanisms to increase the flow of professionals or other skilled workers from Japan. This could be done through cooperation between the governments or at the company level.

The cooperation is expected to be beneficial for Japan because it would provide job opportunities for senior citizens in Japan who have entered the retirement phase but are still willing to share their valuable knowledge elsewhere. Given the size of the potential training or knowledge upgrading for professionals or other skilled workers in Indonesia, the positive impact that Japan could gain from this cooperation could be quite significant. It is, therefore, an idea worth exploring for real implementation in the future.

For the company-level approach, the government could relax some immigration regulations related to the flow and stay of professionals and other skilled workers from Japan. This could be included as a commitment for Indonesia under the bilateral free trade agreement (FTA) between Japan and Indonesia, for example. At present, the most open commitment made by Indonesia in an FTA is in the ASEAN–Australia–New Zealand FTA, whereby foreign professionals, as part of their movement within companies, are allowed to stay in the country for a maximum of two years for the duration of their working permits (see Table 5-1). To allow for the smooth transfer of knowledge from Japanese professionals, the working permit durations would clearly need to be extended rather significantly.

Concluding Remarks

With the reference year of 2045, this chapter presents some ideas for enhancing cooperation between Japan and Indonesia in the future and for cooperation in the area of

foreign investment. FDI from Japan to Indonesia needs to increase significantly in the future, and the distribution of FDI across sectors must become more even to support the adoption of advanced technologies by industries in Indonesia. These changes can be expected to increase the capacity and, later, the performance of Indonesian exports in the future. Stronger expectations of FDI from Japan in the future mean that investment needs to be of a high quality, considerably higher than its current level. Again, this is for the objective of allowing faster technology adoption by industries in Indonesia.

Table 5-1. Intra-corporate Transferee Commitment in the AANZFTA and ASEAN MNP

Country	AANZFTA			ASEAN MNP		
	Intra-corporate Transferees			Intra-corporate Transferees		
	sectoral coverage (%)	Number of committed sectors of max. 154	Initial length of stay	sectoral coverage (%)	Number of committed sectors of max. 154	Initial length of stay
Brunei Darussalam	99.4	153	3 years	99.4	153	3 years
Cambodia[a]	99.4	153	2 years	99.4	153	2 years
Indonesia	31.2	48	2 years	61	94	2 years
Lao PDR	18.8	29	6 months	68.8	106	1 month
Malaysia	25.3	39	Not to exceed 10 years[b]	70.8	109	Not to exceed 10 years[b]
Myanmar	13.6	21	1 year	38.3	59	1 year
Philippines	29.9	46	1 year	59.1	91	1 year
Singapore	98.7	152	2 years	98.7	152	2 years
Thailand	39.0	60	1 year	55.2	85	1 year
Viet Nam	63.6	98	3 years	70.1	108	3 years

AANZFTA = ASEAN–Australia–New Zealand Free Trade Agreement, MNP = Movement of Natural Persons, Lao PDR = Lao People's Democratic Republic.

Notes: a) Cambodia's MNP Agreement lacks this but its AANZFTA includes '07Bf' (Trading for own account or for account of customers, whether on an exchange, in an over-the-counter market or otherwise, the following: money market instruments (cheques, bills, certificate of deposits, etc.), foreign exchange, derivative products incl., but not limited to, futures and options, exchange rate and interest rate instruments, including products such as swaps, forward rate agreements, etc., transferable securities, other negotiable instruments and financial assets, including bullion;

b) Malaysia, two years or so, in practice (results of an interview with a Malaysian economist).

Source: Adapted from Fukunaga & Ishido (2015).

The expectation of higher quality FDI from Japan means that Indonesia needs to first increase its domestic absorption capacity and, at the same time, increase its capabilities in human capital and R&D infrastructure. Indonesia also needs to open its services sectors more for FDI from Japan to facilitate the establishment of its industries in GVCs. Improvement in Indonesia's human capital would expand and intensify cooperation between Japan and Indonesia. The two countries could devise cooperation mechanisms to allow a much higher flow of professionals or other skilled workers from Japan, which could be done at the government or company level.

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Challenge 6
Future Indonesia–Japan Collaboration in Human Resource Development in Response to the Digital Revolution in Manufacturing and Services

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Introduction

This chapter aims to explore the future relationship between Indonesia and Japan in the field of human resource development as well as research and development (R&D) in response to the rapidly evolving digital world. The problem of ageing and the decreasing population with a low birth rate is the biggest challenge for the Japanese economy and society. While the development of technologies may help Japan to handle these problems, cooperation between Indonesia and Japan could provide the potential to address these problems more quickly and perhaps with lower costs and fewer disruptions. The chapter will discuss various potential efforts by both governments to improve productivity in Indonesia such that it would be more compatible with Japan's, especially in the areas of manufacturing, services, energy and resource management, and environmental issues. The urgent issue in improving productivity to narrow the gap with Japan is for Indonesia to upgrade its innovation system and technological capability, for which education is an integral component.

The Innovation System and Technological Capability

One way to graduate from being a low-value-added producer to a higher position in the value chain is through innovation. One of the common misconceptions regarding innovation in developing countries is that all R&D activities are 'too advanced' or at least not yet relevant for the development process. R&D activities are considered too luxurious

for countries in the early stage of the development process when incomes are still low and modern sectors beyond the primary sector do not exist.

At present, R&D has not been an important factor in affecting competitiveness (Kuncoro, 2002, 2014). Data from the United Nations suggest that Indonesia's average value of R&D expenditure between 2000 and 2014 was 0.07% of gross domestic product (GDP). Meanwhile, spending on higher education, an important element in the country's innovation system, was only 0.46% during the 2007–2014 period, the second lowest amongst Association of Southeast Asian Nations (ASEAN) and Group of Twenty (G20) countries. Only the Philippines had lower spending, at 0.29% of GDP.

The small figure for R&D expenditure is also reflected in Indonesia's total factor productivity (TFP) growth, which ranged from a negative value to a small positive value below 1%. This was below the norm for East Asian and Southeast Asian economies: Malaysia, Thailand, the Republic of Korea, and Taiwan recorded rates of 0.9%, 1.8%, 1.5%, and 2.0%, respectively (BAPPENAS–UNSFI, 2002). A more recent study yields more optimistic results, with 1.7% TFP growth in the 2000–2007 period (Van der Eng, 2009). However, the growth may have originated more from technology embodied in imported capital goods (process innovation) than from product innovation.

The Public R&D System

The public research system in Indonesia consists of the R&D institutes of the Ministry of Industry and research institutes under the supervision of the Ministry of Research and Technology. The Directorate General of Higher Education, formerly under the Ministry of Education in 2014 at the start of the Jokowi administration, was consolidated the under Ministry of Research and Technology and Higher Education. Two notable institutes under government control are the Indonesian Institute of Science and the Agency for Technology Assessment and Application.

The system's activities are mostly supply-driven, not linked to the needs of industries in general. Due to the lack of funding as well as their bureaucratic nature, the performance of the institutes often lags behind other typical R&D institutes in developed countries. Improvement of the organisational culture, linkages with industries, and professional

management are the keys to improving these institutes. Government-mandated linkages with foreign research institutes, such as a new policy that requires domestic universities to have some types of partnership with overseas universities, would improve performance. Japan could help in mapping the research institutes in Japan that are suitable to be partners for the Indonesian Institute of Science and the Agency for Technology Assessment and Application.

The Private Sector

For the private sector, even if R&D activities do exist, most are in the form of process innovation. Process innovation involves substantially improved or new production processes through the introduction of new processing equipment or the re-engineering of operational processes. There are three situations where process innovation may take place: setting up a new production line, introducing a new production system, or introducing new computer or information technology components to upgrade production facilities. This type of R&D may result in cheaper products and/or better products, but rarely new products. This is not to say that product innovation does not exist at all in Indonesia. There are some notable R&D firms in Indonesia, mostly dominated by the Japanese motorcycle companies, Honda and Yamaha. Due to its supply of researchers, its university system, and the availability of other supporting infrastructure, Thailand is preferred over Indonesia for the location of R&D units (Frankema and Linblad, 2006).

The commodity boom from 2004 to 2012 distracted Indonesia into choosing the path of industrialisation with less technological effort, while other countries in Southeast were able to embark on the path of high technological content in their manufacturing exports. Apart from this, the failure of Indonesia to sustain high-tech manufacturing exports after 2004 can be attributed to weaknesses in the country's innovation system. Amongst these weaknesses are the narrow technological capabilities for absorbing and improving imported technologies, the underdeveloped capital goods sector, and low technological effort (Lall, 1998). This also reflects Indonesia's stagnating if not declining involvement in international production networks (Ando and Kimura, 2013). As a result, manufacturing exports are dominated by resource-based industries, especially palm oil, that are characterised by low technological effort and low risk (Kuncoro, 2018).

There are four areas where Japan could enhance its compatibility with the Indonesian economy by raising the productivity of the latter through the process of technology development. The first is to improve Indonesia's access to foreign technologies, including through foreign direct investment. The second is to boost collaboration in education, including vocational and higher (university and college) education, to improve the quality of human resources. Collaboration amongst shop floor workers and managerial-level exchange at the firm level could fill the void for skilled workers brought by the demographic ageing of the population in Japan. This would also help the spread of technology and information spillovers for connecting the private sector, the education system, and the government (the triple or N-helix model). Next, it is equally important to assist in ensuring the availability of supporting services for technology development. Implementation could be delivered through government-to-government (at the ministry level), business-to-business, and institution-to-institution (universities) schemes. The final area is measures to ensure adequate finance for technology development.

Education

As do some other countries, Indonesia follows a system of duality between general and vocational education. The objective of general education is to provide pupils with general academic knowledge as a springboard for higher education and training. Vocational education, on the other hand, provides students with practical skills and knowledge useful in daily life in society. The vocational education curricula comprise a blend of general and occupation- or profession-specific knowledge. For the purpose of adaptability, the skills provided by schools can be transferable between occupations (Shavit and Muller, 1998).

In Indonesia, the argument to support both tracks of general education, particularly those at the university level and in vocational schools, is that as the easy phase of industrialisation has come to an end, Indonesia needs to continue to climb up the ladder in manufacturing and services. With the coming of the era of the Industrial Revolution 4.0, the government should provide a vocational system that teaches practical skills but that is also flexible enough to meet rapid technological changes or technological disruption. Higher education is essential since it is an integral part of the innovation system.

Higher Education

The process of globalisation has made higher education more important than before – even poor countries can no longer neglect the development of higher education. Higher education as a creator, adaptor, and disseminator of knowledge can be used as a vital tool for developing countries to benefit from globalisation. Knowledge accumulation in higher education allows developing countries to jump up the learning curve without having to undergo the lengthy and expensive process of discovery by accessing ideas and technologies developed elsewhere and putting them into practice after some modifications. In terms of higher education, Indonesia is definitely behind most of its nearest competitors in Southeast Asia, such as Malaysia and Thailand. Too many universities in Indonesia are just teaching institutes still locked into the old methods of learning.

Japan, with its well-established higher education system, could help Indonesia to reform its higher education system as entrepreneurial universities by adopting a corporate-like governance and management model and moving from discipline-based to thematic-based compartmentalisation. In this setting, higher education functions as a knowledge enterprise to be more responsive to social and economic demands and to make the country more economically competitive. Previous strategies to link the Indonesian innovation system with other partner countries can be replicated in Indonesia–Japan collaboration with some modifications. These are summarised in Table 6-1.

The Digital Revolution and Higher Education

The coming Industrial Revolution 4.0 (digital disruption) has put the relevancy of higher education into question. New technologies will swarm society in all aspects of life, including higher education. Meanwhile, there have been optimistic predictions that new technology will increase prosperity. On the other hand, with digitalisation and automation, many jobs will be eliminated or at least redefined. These include telemarketers, auditors, lecturers, and administrator in universities, etc.

Many universities around the world are aware of what is coming. However, unfamiliarity with the massive shift in technology as well the lack of vision and commitment mean many

may be caught unprepared. Unlike other industrial revolutions in the past, digital disruption is more difficult to anticipate, which will eventually make technological adaption difficult (Hill, 2017). This is due to its virtual characteristic as well as the pace of technological shift that is beyond the normal range of organisations' visions. Newly created technology, such as smart mobile devices, cloud-based information technology (IT), and advanced data analytics, are altering organisations' business models, including those of universities.

Table 6-1. Indonesia–Japan Collaboration Plan to Strengthen the Innovation System in Indonesia

Level of Collaboration	Actions
Government	• Increased or more targeted collaborative research funding should be a priority for both governments • Regulatory reform to streamline the procedures for research collaboration
Individual institution	• Investigate joint opportunities to improve research skills • Continue to host relevant forums and events to promote cooperation between institutions in the two countries
Government and individual institution	• Short-term, reciprocal researcher mobility projects, funded by either the government or by institutions to support capacity-building and the development of researcher cooperation • The creation of a research portal to connect Japanese and Indonesian researchers, promote the strengths and interests of the respective sectors, and become a repository of collaborative research • Conduct a mapping exercise that highlights Japan and Indonesia's research expertise

Source: Authors' compilation.

For universities to remain relevant in the digital age is not easy. IT is only a small part of the endeavour. More importantly, universities require an institution-wide strategic vision by the top management supported by departments and faculties, not just IT (PricewaterhouseCoopers, 2018). To be able to form a future university vision, the top management needs to be able to understand and overcome several hurdles (Table 6-2).

Table 6-2. The Lack of Vision in Higher Education

	Potential Obstacles
1	No understanding that universities have a new breed of customers that they need to cultivate
2	Unaware of competition from new competitors
3	Inability to come up with measures to adapt the existing working system to rapidly evolved new techniques, tools, and capabilities
4	Organisational culture that inhibits rapid development and the release of new technology
5	Technological phobia: a lack of trust in digital services and technologies
6	Technological phobia: overly concerned about reliability, security, and resilience
7	Digital literacy

Source: Adapted from PricewaterhouseCoopers (2018).

One important adaptation for universities in the digital age is to use data analytics in organisational planning. This requires building up data analytics capability within the organisation. This includes practising evidence-based management, building an evidence-based decision-making culture, and recognising the evolving landscape due to big data and the digital revolution. The next task is to identify the opportunities through which the decision-making process can be transformed with the analytic model and to embed the results of data analytics into the decision-making process for improving organisational performance. The final step is to measure the impact of analytical transformation through surveys and data collection in the feedback loop mode.

Vocational Education

The mobility of skilled and educated workers will increase under the ASEAN Economic Community (AEC). For Indonesia, in order to exploit this opportunity, the priority is to improve higher and vocational education. In the formal vocational education system, including polytechnics and vocational high schools (SMK), the problem is that the number of teachers or instructors with occupation-specific qualifications and work experience is relatively small compared to those with academic S1 or S2 degrees (ADB, 2012). Teaching laboratories and equipment are mostly outdated and have not kept up with the current technological progress. This suggests that the special characteristics of vocational schools are not addressed in their accreditation standards, which are basically the same as for general high schools. Reforms of the national accreditation system are needed.

The Japanese government could draw a comparison with the educational system in Japan in order to start a system for expatriate exchange. This could be accomplished through mutual exchange amongst officers from the Ministry of Education and the Ministry of Higher Education with their counterparts in Japan, as well as between individual education institutes (universities and schools). The Japanese government, through the Japan International Cooperation Agency (JICA), can also help to set the content and methodical settings of the productive activities in schools since schools are free to design their own context-related approaches, including the arrangement of apprenticeship blocks, the establishment of profit-oriented school production units and, more recently, also a model called 'teaching industry,' as demonstrated by Japanese companies like Honda and Toyota. These are basically project-oriented programmes that are planned and conducted in partnership with the industry and focus on the market-relevant products and services to be developed inside the schools jointly by industry experts, teachers, and students. Despite this, the programmes may differ considerably in quality, effectiveness, and sustainability since they depend on the characteristics of the companies that are involved.

To summarise, there are several steps that must be taken to make a successful vocational school, (Table 6-3). In the formal vocational education system, including polytechnics and SMK, the problem is that the number of teachers and instructors with occupation-specific qualifications and work experience is relatively small compared to those with academic

bachelor's or master's degrees. However, the bigger problem is that the special characteristics of vocational schools are not addressed in their accreditation standards.

Table 6-3. Measures for Successful Vocational Schools

Measures	Requirements
Ensuring relevant curricula	All stakeholders (government, employers, social partners, educational institutions) must be involved in the curricula development with clear assignments and responsibilities for each party
To make close engagement with the labour market	A continuous feedback system between employers, the private sector, and the education system
Ensuring high-quality schooling	Sufficient funding is needed to sustain the appropriate teaching materials and the availability of well-trained teachers
Incentives for training providers and creating competition between training providers	A mix of public and private funding is required in addition to providing autonomy in teaching and staffing decisions
Maintaining a high level of training quality	A decentralised system of accreditation and quality assurance as well as competition between training providers
Limiting the risk of establishing a dead-end vocational track	The competence and qualifications acquired should be comparable to allow for the possibility of switching or transfer

Source: Eichhorst et al. (2012).

Non-formal Training

General high school graduates in Indonesia can match the wages earned by vocational school graduates only when they take additional training conducted by non-formal training providers, such as the government-sponsored training shop known by its Indonesian acronym as BLK (Kuncoro, 2012). However, this slight advantage could be nullified again if the vocational school graduates also take extra training through the non-formal track. This

demonstrates the high value of non-formal training. Nevertheless, private firms are reluctant to upgrade the quality of their workers since it is very hard to retain them in their companies.

For the government, however, the potential value of non-formal training for earning higher wages poses the dilemma of whether to prioritise only the general education stream and invest more into non-formal training opportunities, or to promote their more expensive formal vocational education system, e.g. by expanding and upgrading SMK. In the short run, the first option might appear to be more attractive (and cheaper) to flexibly bridge the skill gap through non-formal training programmes. However, improving and upgrading the formal vocational education system is also required for moving up the ladder towards a formal economy. With a clear focus on occupation-specific competency profiles and industry compliant qualification standards, this system may better promote long-term career options for graduates provided it addresses also the empowerment of lifelong learning capacities. Financial assistance from JICA could resolve this dilemma through the building-up of long-run technological capabilities.

Small and Medium-sized Enterprises

One of the beneficiaries of the upgrading of education quality in Indonesia is the small and medium-sized enterprise (SME) sector. SMEs are important for Indonesia for employment creation. In terms of numbers, SMEs comprise 99% of firms in Indonesia. In terms of employment, the smallest category of SMEs creates 91% of total employment, while the small and medium categories contribute 4% and 3%, respectively. The share of SMEs' exports is smaller than large firms but still significant. The latest figures show SMEs' share in total exports to be about 15%. This suggests that improvement in the national productivity would not be successful without the involvement of SMEs in national and international production networks (Sato, 2000). The linkages between large firms and small-scale industry clusters matter in developing countries. Clustering allows small-scale enterprises to share costs and risks through collaboration (Sandee and Rietveld, 2001).

The Service Sector and Urban Agglomeration

The share of trade-hotel-restaurant, transportation, communication, finance, and other services (the service plus sector) in GDP has taken over manufacturing since 2007. Meanwhile, the growth of the 'service plus' sector has also exceeded that of manufacturing. This is one of the most important developments in the growth dynamic as, since 2007, the service sector in a broad sense has started to be a growth driver for the Indonesian economy, and, in a way, it has compensated for the decline of manufacturing.

The rising role of services in cities is tantamount to urbanisation spillovers, in which cities form a conducive environment for firms due to information spillovers (Jacobs, 1969). It has been shown that firms' dynamics are closely linked to the overall changing environment in their respective cities because they have the potential to capture the efficiency gains from learning-by-doing as well as the increasing returns to scale due to urbanisation. But the relationship between firms' productivity and their environment is not always straightforward. Once an agglomeration passes a certain size, then new problems emerge. The Japanese government, through JICA, could help the Indonesian government to learn how to manage an agglomeration – how to deal with firm and population dynamics. The most challenging task is perhaps how to coordinate several agglomerations in terms of connectivity and complementarity to maximise their potential. Otherwise, if not properly managed, then negative externalities like congestion, pollution, and crime may start to reign.

The Japanese government's assistance for Indonesia could involve a combination of policy support, urban planning, and infrastructure investment. Rather than attacking all problems, the assistance may want to refocus efforts on policy support and urban planning for the simple reason of improving the capacity of local governments. The competitiveness of urban agglomeration will be determined largely by the configuration of industry and population location, the regulations pertaining to economic activities, as well as the connectivity within and between agglomerations.

JICA could assist the Indonesian government in reviewing the urban management and planning system in Indonesia. As a first step, this could perhaps be conducted through case studies of two or three cities. A review of urban management and planning is essential if

the benefits of the spatial division of labour are to be realised. The competitiveness emerging from the spatial division of labour may go to waste if the proper management and spatial planning do not exist – for example, industries may be wrongly located, or industrial and population centres may not have cohesive connectivity, preventing knowledge spillovers.

Environment

The growing concern for the environment has been incorporated into the medium-term development plan. One focus is on the manufacturing sector for industries like cement, steel, pulp and paper, petrochemicals, textiles, and garments. Preliminary exercises suggest that there is a trade-off to be made. The priorities, however, remain growth and employment creation for the good reason that these industries have shown improvements in energy efficiency due to the use of new technology in machinery (Kuncoro, 2014a, 2014b).

This is not an easy job since the government has a trade-off between economic growth and a cleaner environment. In reality, there is a rationale for greening key manufacturing industries due to the availability of modern and cleaner technology for manufacturing. The key step for the government is to formulate policies that support industries to modernise, become more efficient and cleaner, and do so at a faster pace than they would otherwise without such policies in place.

Conclusion

The potential for synergy between the Japanese and Indonesian economies is enormous. Indonesia's attributes as a dynamic country with a relatively young population characterised by diversity, a growing middle class, plenty of room for innovation, and an increasingly competent workforce could energise Japan's economy and society. Meanwhile, the maturity of Japan, as evident in its advanced technology, sophisticated lifestyle, and its experience in managing its development, both its successes and failures, could help Indonesia exploit its demographic in the long term. For the benefits of cooperation to be maximised, however, some complementarity and a level playing field are needed. Indonesia needs to narrow its productivity gap with Japan.

From the Indonesian side, the government acknowledges that the country's problem is with the supply side of the economy. The most recent developments of Indonesia's deteriorating currency account and growth slowdown demonstrate the country's vulnerability to external shocks. Prudent macroeconomic management, a flexible exchange rate, external creditworthiness, and assistance from development partners have helped to mitigate the impacts. In the longer run, however, the country needs to improve its productivity. Until 2012, the commodity boom had masked the country's weakness in its supply side. Improving productivity in Indonesia's supply side will require not only infrastructure but also the upgrading of the country's human resources and innovation system as the world has moved into a digital economic revolution. From the production side, Indonesia needs to revitalise its manufacturing and services sectors as well as its resource-based sectors, treating them as part of the value chain to be integrated with the global network.

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Challenge 7
Rural Economic Revitalisation and Regional Development

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Less Java-centric Development

Indonesia aims to distribute its economic activity more evenly outside Java, particularly to Eastern Indonesia. The government has targeted reducing Java's share in the national output from around 60% in 2015 to around 50% by 2045. In the context of rural development, a national development paradigm that is less Java-centric will be relevant.

Although the total rural population in Indonesia is projected to decline to about 29.6% in 2035, it will still consist of 90.5 million people, almost equivalent to the size of Thailand's present overall population. The rural population will live predominantly (71.3% or around 64.5 million people) outside Java Island. By that time, the share of the rural population in islands outside Java (46.6%) will be almost similar to that of Indonesia today (45.5%). A vision of less Java-centric development should focus on regions outside Java, which coincidently have stronger rural characteristics.

Reducing inter-regional disparity in economic development will rely much on reducing the infrastructure gap. Less-developed regions, particularly those outside Java Island, are the focus of the Indonesian government's ambitious infrastructure development. In summary, at least the following areas have been outlined by the government for its 2045 long-term vision. The first area is strengthening physical and virtual connectivity.

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* This contribution was made before the author joined UN ESCAP as Executive Secretary and Under-Secretary-General of the United Nations effective on 1 November 2018.

For example, the government has targeted that by 2045 logistics costs should decrease from 19.2% of gross domestic product (GDP) today to 8%. Another specific plan is to build at least six international seaports as well as increase the share of sea transportation in the distribution system. Lastly, the government has also mentioned the need to build infrastructure that has anticipated the impacts of climate change.

Rural and Agricultural Development

The development of rural areas and agriculture are closely interlinked. As the fourth most populous country in the world, food security is and will be amongst the top development priorities for Indonesia. The Indonesian long-run vision aims to improve the country's food security and be self-sufficient in at least carbohydrate and protein intake through agriculture modernisation. This cannot be achieved without simultaneously revitalising the development of rural areas.

The past underinvestment in rural areas needs to be changed, and quality infrastructure should be developed in rural areas, too. In particular, the Indonesian government envisions rural infrastructure as having compact facilities, serving low-medium mobility, and supporting agriculture and mining-based industries. In terms of agriculture, irrigated agricultural land is targeted to be at least 40% of all agricultural land by 2045. This will contribute to the target of expanding agricultural value added and becoming an exporter of processed agriculture products.

Improving farmers' welfare is also on the priority list. As of today, 46.2% of the bottom 40% of the population are farmers. The Indonesian government envisions substantially improved welfare for farmers in 2045. The productivity of farmers is targeted to be 4.3 times higher than in 2015, and their entrepreneurial skills should be enhanced. Strategies to achieve these targets include agrarian reforms, increasing farmers' human capital, improving access to productive resources, strengthening farmers' business institutions, integrating farm and non-farm activities, innovation, and the application of food and agriculture technologies.

Challenges in Reducing Rural Poverty

Although Indonesia's poverty incidence at the national level continues to decline, the poverty incidence in rural areas is still high. In 2017, as many as 13.5% of the rural population, or around 16 million people, were still living under the poverty line. The poverty line is equivalent to around PPP$2.4 – quite close to PPP$1.9, which is considered the extreme poverty line, the median poverty line of low-income countries (Jolliffe and Prydz, 2016). Moreover, the rate of poverty reduction is also still higher in rural areas.

Monetary poverty is not the only representation of the welfare of the rural population. The problem lies in the weakness of the monetary measure of poverty incidence. Monetary income is a private good, while welfare is also a function of access to various public facilities and services and is no longer complete in capturing the true measure of deprivation. Multidimensional poverty can be an important complementary measure.[2] Rising income and consumption amongst the monetary or multidimensional poor can lead to improved nutritional intake and outcomes, or improved access to education, healthcare, and related outcomes, but public spending is important in terms of the provision of free or subsidised public education and healthcare. Social policies, such as redistributive transfers, can further support the reduction of both monetary and multidimensional poverty.

According to some studies, at the national level, both standard monetary poverty and multidimensional poverty are declining over time at almost similar rates. For urban areas, even the levels are similar, meaning that not only are they declining at almost the same rate, but their levels of incidence are similar. For rural areas, multidimensional poverty is much higher than standard monetary poverty. This implies that there are many hidden dimensions of poverty disguised by standard monetary poverty. To address the true welfare gap between the urban and rural population, we need to look carefully at various dimensions of welfare and deprivation. This is even more relevant in the context of assigning what needs to be achieved in the context of the Indonesia Vision 2045.

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[2] Yusuf and Sumner (2018), following and extending Alkire and Foster (2011), estimated Indonesia's multidimensional poverty for the period 1994–2014.

The Challenges of Low Employment, Education, and Skills amongst the Rural Population

Recent statistics on development outcomes that distinguish between urban and rural areas still show large gaps in various dimensions. We can identify that the rural–urban gap is largest for those indicators related particularly to the young population and women. In particular, the lagging indicators include ones related to child marriage, teenage fertility, and the access of the young population to skill formation (such as information and communication technology and university education). For example, child marriage in rural areas is three times higher than in urban areas. As a result, the fertility rate amongst very young women is also much higher than in urban areas, where the gap is 115%. The urban–rural gap in labour formality in rural areas is also amongst the highest (105.6%).

This points to the conclusion that if we want to narrow down the urban–rural gaps in development, efforts should be directed to opening up opportunities to the young population in rural areas, especially regarding access to skill development through training and higher level education. Particular attention should be given to the female young population in rural areas. This will be an effective way of addressing the related gaps, such as the high labour formality gap and underemployment gap. Skill development certainly needs to be addressed through certain types of formal education, such as tertiary education. However, it can also be developed to be more vocational in nature, for example by establishing polytechnics or technical schools near rural areas. Informal education through access to information and communication technology should be expanded more progressively to rural areas as these areas are where the urban–rural gap is the largest.

Sanitation facilities (such as improved sanitation and hand-washing facilities) are another area where the rural–urban gap is amongst the largest. This is significant as bad sanitation is highly related with the incidence of diarrhoea amongst children below 5 years of age, and it may have a lasting impact on child development through ineffective nutritional intake, which is an important factor for future skill development.

Challenges in Agricultural Transformation

Indonesia, along with many other developing countries, has experienced premature deindustrialisation. Realising the vision of reindustrialisation and the diversification of economic activities is difficult without credible strategies to overcome this trend. The future challenges of favourable structural transformation need to be anticipated in line with the past and recent trends. The trend of structural transformation in the last 15 years shows several relevant observations.

First, even in rural areas, both in Java and outside Java, the proportion of people employed in agriculture has been declining. Yet, the share of agriculture employment in Java in 2016 was similar to that of Java 15 years earlier. In rural Java, there seems to have been a slowdown in the rate of decline of agricultural employment in the last five to six years. For the last three years, it seems to have been stagnant at 47% of employment.

Second, there is no notable emergence of manufacturing industries in the rural areas. In the rural areas of Java, manufacturing employment was around 10% at the beginning of the 2000s and stayed at almost the same level for the next 15 years. A similar trend is observed in the rural areas outside Java Island. This is rather worrying in terms of finding optimal structural transformation. Manufacturing in rural areas is good for off-farm value-added generation, which uses agricultural products as its inputs. Agriculture-based manufacturing, even on a small scale, has the advantage of the better location of materials and the ability to generate employment.

Third, there has been a notable increase in the share of employment in the 'other services' sector. These services are mainly social and community services with very low productivity. In both rural and urban areas in Indonesia (in Java and outside Java, without exception) there has been a shift in employment from agriculture to low-productivity services sectors. The share of manufacturing employment in urban areas in Java has also been relatively stagnant and is even becoming slightly smaller in regions outside Java. The only sector where the relative size of employment is increasing is the 'other services' sector, which, again, is typically low in productivity.

Longitudinal data (such as the Indonesian Family Life Survey) that record the same individuals for different periods can help us gain a better view of the long-run structural

transformation. These data show several highlights.[3] First, most rural jobs are in agriculture, followed by services then industry. Second, people in rural areas change employment from agriculture to industry and services. However, many of those in rural industries and services revert back to agricultural employment. Perhaps this is the reason why the rural economy has remained agricultural for a long time. As we know that the urbanisation rate is rising in Indonesia, the typical nature of this urban–rural employment shift, where the movement is to sectors with not very high productivity, will tend to (but not necessarily) increase inequality in urban areas, and poverty reduction will become more challenging.

The abovementioned discussion shows that Indonesia is having difficulties and has not been successful in managing its agricultural transformation or its structural transformation. The most successful Asian economies have pursued an agricultural development-led industrialisation pathway (Briones and Felipe, 2013). A successful structural transformation is characterised by an agriculture transformation that through higher productivity provides food, labour, and even savings to the processes of urbanisation and industrialisation. A dynamic agriculture sector increases labour productivity in the rural economy, raises wages, and gradually eliminates the worst dimensions of absolute poverty. As Timmer (2014) pointed out, despite similar starting points in the late 19th century, Malaysia has followed Japan's successful experience of agricultural transformation, while Indonesia has lagged significantly behind. Recent trends suggest that labour moves from rural areas to urban areas yet is absorbed in the low-productivity services sectors. In realising the vision of more diversified economic activities, food security and improving the welfare of farmers is difficult without strategies to overcome these challenges.

Challenges in Improving Farmers' Welfare

The trend of the farmers' terms of trade – statistics measuring how farmers' income changes relative to their living costs – suggests only slow improvements over time. For example, during 2011–2018, while Indonesia's GDP per capita, a measure of the welfare of the average Indonesian, increased by around 20%, the farmers' terms of trade did not

[3] Suryahadi et al. (2018) carried out analysis using data covering 17 years from the Indonesian Family Life Survey.

change much. This was despite the many policies, programmes, and even large government funds directed towards farmers and the agriculture sector.

There are two main reasons why farmers' welfare has been experiencing stagnation in recent years. The first reason is the rise in the cost of living in rural areas, particularly in the cost of food products, as the majority of farmers' families are actually net consumers of food products. The data suggest that in recent years, the poverty line (which mainly contains food commodities in their representative basket) has increased faster than the general consumer price index. Farmers cannot keep up with the fast increase in the cost of living. Second, the increase in food prices is not directly translated even to the farmers who sell those commodities because of inefficient distribution. Higher prices for agricultural products benefit traders rather than farmers.

Both at the global level as well as in Indonesia, there is an increasing trend of protectionism. This poses another challenge to Indonesia's aspiration for the diversification of its economic outputs as a slowdown in world trade as a result of a globalisation reversal will narrow the market potential of Indonesia's products. Moreover, a food self-sufficiency agenda through protectionism is often incompatible with the food security agenda and farmers' welfare.

Indonesia–Japan Potential Areas of Cooperation

Rural development, in the context of agricultural transformation, as well as the more equal distribution of economic activities across the archipelago is important not only for more regionally balanced development but also for supporting inclusive economic development. When the rural areas, as well as the non-Java regions, become more developed through the development of higher value added, diversified economic activities, and more productive farmers, the tensions of the inequality-increasing structural transformation will be reduced, resulting in more inclusive economic growth.

In order to revitalise the rural economies, the rural and non-rural economies will need to be synergised. In the case of Indonesia, two types of economic linkages should be strengthened. The first is connectivity from rural to urban areas in general, and the second is connectivity from the predominantly rural non-Java regions to the predominantly urban

Java regions. Physical connectivity, such as through better roads and shipping lines, will open up more opportunities for the localisation of rural economies, such as transporting villages products to urban areas, or transporting people from urban areas to rural areas as direct consumers of agricultural products (such as visiting farmer markets) as well as consumers of agro-tourism in rural areas.

Indonesia–Japan Cooperation for Strengthening Urban–Rural Connectivity

In countries where successful rural revitalisation has taken place, such as in Japan, connecting the rural and urban markets has been a necessary condition. For example, in the process that is called 'localisation', i.e. the process of localising the reorganisation of the rural economy with new resources, new forms of human capital, and new channels is opened to the outside world. Ouchi (2009), using the example of Japan, described this as 'the next rural economy,' the third stage of the rural economy in Japan, after urbanisation and globalisation. He describes localisation as the process of opening new channels to urban consumers ('channel-isation from the local') and the new regional market ('place-isation to the local'). Channel-isation was advanced mainly by individual entrepreneurs and place-isation by collective efforts. Channel-isation is a new way to connect to urban markets, and place-isation is a new opportunity for urban spending to come to the rural areas.

Oichi (2009) stressed the important necessary conditions for this kind of rural economy revitalisation to take place. First, both processes depend on highly advanced transportation and communication systems. Therefore, infrastructure for connecting not only the rural and the urban areas but also farmers' markets and farmers is important. Secondly, technology plays a major role in supporting the place-marketing of rural areas by confirming the responsibility of farmers for their products. Thirdly, it is necessary to connect urban and rural areas physically, i.e. through transportation, and virtually, i.e. with the help of information and communication technology.

Therefore, there are at least three areas of cooperation between Indonesia and Japan that can be beneficial in supporting the rural economy revitalisation. The first area is developing the physical infrastructure to connect the rural and urban areas. This could be by building

or improving the existing urban–rural transportation network with any mode most relevant, such as land or rail transport.

The second area is improving or speeding-up the development and access to information and communication technology in rural areas. As can be seen from the previous discussion, the urban–rural gap is largest in these areas.

The third area is preparing the rural population to be ready for the more connected rural–urban economies through both formal and informal education and training. There are many examples of how informal education can help prepare the rural population to be more prepared for meeting the challenges of the rural economy's revitalisation. It is also important to note that this process can take some time to deliver progress. In Uchiko town in Ehime Prefecture in Japan, a town where rural localisation is seen as a world best practice (Ouchi, 2009), for example, the town opened a community school called 'the Intellectual Rural School' as a forum in which to consider the options for revitalising agriculture in Uchiko. The school head was the mayor, the students were citizens, and speakers were invited from outside the town to discuss issues like the branding of agricultural products, the regional circulation of products, economic opportunities for rural women, and so on. This is a good example of how education and training are areas where cooperation between Indonesia and Japan can be explored.

Indonesia–Japan Cooperation for Strengthening Connectivity from the Non-Java Regions to the Java Regions

As mentioned above, the population who live in rural areas in 2035 will live more predominantly in the islands outside Java, whereas Java will be more predominantly urban. Java's urbanised economy, then, could be a potential market for the rural non-Java economies. On the other hand, Indonesia also envisions less Java-centric economic development in 2045. Java's richer economy should translate into demand for non-Java's supply of their products, including those from rural areas. To facilitate this, Indonesia needs to improve connectivity between the Java and non-Java regions.

Areas of cooperation between Japan and Indonesia to be explored further may include but are not limited to such areas as inter-island transport and shipping and seaport

development and management. Moreover, Japan is more advanced in terms of adopting new technologies in the management of this area, and Indonesia can benefit from the cooperation. In addition, Japan also shares the characteristic of being an archipelagic country and so can share its experiences in improving connectivity. The cooperation can also extend toward the fisheries sector (where non-Java, particularly eastern Indonesia, has a natural advantage) related to high-technology adoption (such as stock monitoring, more efficient vessels, and so on) as well as in building maritime infrastructure that can serve the needs of the fishery industries.

Indonesia–Japan Cooperation in the Management of Rural Economy Revitalisation

Japan's biggest challenge in revitalising its rural economy happened just after World War II, particularly in the 1950s when rapid urbanisation started to take place. High economic growth in the 1950s led to rapid urbanisation, and the young population migrated to urban areas in large numbers. Japan's countryside regions were also urbanised. Both central and local governments intervened by facilitating industries to move from the concentrated urban areas to rural areas. As a result, the rural economy was transformed into having a dual structure of agriculture and industry (Ouchi, 2005).

The urbanisation challenge in Japan in the 1950s was more or less similar to Indonesia's of the past 15 years. However, as described in the previous sections, during this episode, non-farming activities, particularly high-value-added activities, such as in agro-industries, did not significantly emerge as industry's share in rural employment was stagnant from 2001 to 2016.

In Japan, this process of urbanisation and the dual economic structure in rural areas divided farmers into full-time farmers and part-time farmers. Full-time farmers enlarged the scale of their operations and adopted an industrialised approach, including modernisation, for production in order to be successful. Scaling up and modernisation need innovation and technical change. Science and technology play a bigger role at this stage.

Therefore, at least two key lessons can be drawn. The first is that the government (both central and local) plays a role in the facilitation of rural economy revitalisation, and the second is that agriculture activities become more productive through the increase in

landholding and modernisation through capital deepening and science and technology adoption. Today's more decentralised Indonesia still has room for the increased involvement of the provincial and local governments in the process of the revitalisation of rural development. Indonesia can learn from exactly how Japan has successfully done this, and both countries can explore areas of cooperation.

The challenges of urbanisation and other external pressures can be eased through the diversification of rural economic activities. Agro-industries and rural tourism have been developed in various rural areas in Japan. Building a profitable and sustainable tourism sector requires more than only financial investment. Building a tourism sector is akin to building a culture, as tourism involves not only businesses but also people (who live around the tourist areas, for instance) and consideration of how people interact with nature to ensure sustainability. Indonesia needs an integrated system of education (both formal and informal) and training in tourism development. Indonesia and Japan have large opportunities for mutually beneficial cooperation in the areas of tourism, particularly in rural areas.

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Section 3

To Achieve High Quality of Life beyond SDGs 2030

Mitigating disparities. To tackle social disparities, Indonesia should capitalise on the opportunities provided by its demographic dividend. Improving the quality of human resources will optimise this dividend. There is a wide disparity in the educational achievement of children from households with incomes in the bottom 20% and those in the top 20%. Access to quality health care has yet to be provided for all Indonesians. To mitigate social disparities, it is proposed to enhance Japan's FDI and its links to micro, small, and medium-sized enterprises; provide vocational education and training linked to industry; and develop infrastructure in rural areas.

The use of digital technology, especially communication technology, offers scope for reducing social disparities. Communication technology can enable children living in remote areas and in low-income families to access high-quality education. It can also promote free or low-cost long-distance learning, both in regular and vocational schools, enabling educational needs to be served in an equitable manner regardless of location and social status. Many healthcare services can be provided through telemedicine. Such technology could also be used to create jobs in remote areas. It is therefore important that the infrastructure to use communication technology is provided equally and the education to use digital technology is strengthened.

The 'smart city' concept will be extended and implemented throughout most Indonesian provinces to cope with the anticipated scale of urbanisation. According to the United Nations (2018), more than 55% of the world's population lives in urban areas, and this figure is set to rise to 68% by 2050. The smart city concept is about using technology to optimise city operations and urban flows, and/or introducing smart governance, in which policymaking is more flexible, practical, and closer to citizens.

Preparing for disasters. Both Indonesia and Japan are prone to natural disasters such as earthquakes, tsunamis, volcanic eruptions, and flooding. We cannot prevent such disasters, but we can reduce their risks by conducting evacuation drills and rescue exercises,

preparing emergency food supplies and temporary housing, and drawing up disaster management plans. Digital technology should be utilised to improve disaster resiliency. Early warning systems for earthquakes, tsunamis, flooding, and other disasters should be put in place soon in Indonesia. Japan is a leader in the use of such technologies.

Spurred by the most recent disasters and the subsequent reconstruction of earthquake-affected parts of Lombok and rebuilding of the tsunami-affected areas in Palu and Donggala in Central Sulawesi, disaster management is becoming one of the priority issue for the Government of Indonesia. Japan has supported early warning systems by providing high-technology equipment for the early detection of tsunamis and equipment for monitoring the movements of the earth's tectonic plates. In addition, there is scope for experts and researchers from Japan to co-operate more widely with researchers and geologists from Indonesia in mapping disaster-prone areas. This information could help ensure central and district governments are better prepared when disasters strike, so the death toll and impact can be minimised.

Ensuring environmental sustainability. Indonesia has ratified the Paris Agreement through Law No. 16/2016, showing its commitment to strengthening the response to climate change, which has become an urgent threat to the nation. Mitigation and adaptation measures should be implemented though policy regulation and the institutional setting. The national commitment towards a low-carbon and climate-resilient development path are consistent with the Nine Priority Agendas (Nawa Cita) Framework determined by President Joko Widodo. Indonesia has pledged to reduce greenhouse gas emissions by 26% through its own efforts and by up to 41% with international support. Indonesia's projected economic and population growth will increase energy consumption. The use of renewable energy, such as replacing the development of new coal-fired power plants with clean and renewable energy sources, is therefore an important element. Renewable resources such as fisheries and forests should be used sustainably too. To improve air and water quality and to preserve ecosystems on land and in the ocean. Cleaner technologies should be promoted in various sectors, including the small and medium-sized enterprise sector. Digital technology should be used for monitoring resource stocks and pollution levels.

Challenge 8
Challenges to Fighting Social Disparities in Indonesia

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Poverty, Inequality, and Vulnerability

The decline in poverty incidence in Indonesia has been continuous but has recently slowed. Inequality was at an acceptable level during the 1980s and 1990s, but started to rise to an unprecedented level towards the end of the 2000s. The vulnerability rate – the proportion of people who are near poor or at risk to become poor – has been high. By 2045, Indonesia aims for zero poverty; a Gini coefficient of 0.36; low vulnerability; and a middle class comprising 80% of the population, up from 19% in 2010.

These targets, particularly for vulnerability and size of the middle class, will not necessarily be easy to achieve. In 2015, over 90% of the populations of Malaysia and Thailand were secure and well off, as were 66% in Viet Nam and 43% in the Philippines. In Indonesia, however, only 32% of the population could be classified as secure and middle class, with 67% either poor or vulnerable (World Bank, 2018). Indonesia's Vision 2045 aims to turn this around.

Equitable Quality Education and Training

Indonesia envisions high-quality education for all, with almost universal coverage of senior secondary school enrolment and 60% coverage of tertiary enrolment in 2045.

* This contribution was made before the author joined UN ESCAP as Executive Secretary and Under-Secretary-General of the United Nations effective on 1 November 2018.

Education is key to social mobility, low inequality, and the end of social disparity. Demand-driven vocational education and training can enhance skills and equip the young population for employment. The government must pay more attention to the education of workers from the bottom 40%, including by helping finance skills development.

Reducing Informal Labour

In 2015, only 42% of workers were in the formal sector. The extensive informal sector is associated with low productivity and low workers' protection, which are incompatible with reducing social disparity. Formal sector employment is expected to be at 85% in 2045, accompanied by better social protection. As Indonesia strives to achieve universal social security, informal workers will also benefit.

Ending Malnutrition

Relative to its per capita income, Indonesia is an underachiever in reducing malnutrition, especially stunting and wasting amongst young children. The stunting rate is the second highest amongst Association of Southeast Asian Nations (ASEAN) countries and the wasting rate is the highest. Malnutrition contributes to children's low cognitive quality, hampering social mobility. Indonesia envisions ending malnutrition by 2035.

Comprehensive and Sustainable National Social Security System

Indonesia envisions a comprehensive and sustainable national social security system to protect all its citizens. The continuum of care concept will underlie healthcare, with each citizen's needs supported from the first 1,000 days of life until old age. The focus will be not only be on curative care but also, and more importantly, on prevention and healthy lifestyles. The social security system will eventually cover even workers in the informal sector.

Equal Access to Quality Health Services

Access to quality healthcare is yet to be provided for all. Indonesia envisions substantially

reducing the disparity in both access and health status by 2045. The poorest 20% of the population has significantly less access to healthcare and worse health than the richest 20%.

Redistribution of Economic Opportunity through Micro, Small, and Medium Enterprises

Indonesia envisions a more substantial role for micro, small, and medium enterprises (MSMEs), empowered through the adoption of science and technology, innovation, and access to financing. MSMEs must be linked to large enterprises to generate multiplier effects and reduce socio-economic disparity.

Enhanced Socio-Economic Participation of Women

Indonesia aims to increase women's socio-economic participation to help the country become an economic powerhouse. The 48.9% female labour participation rate is targeted to increase to 65% by 2045. This will not only directly reduce the economic gender divide but also indirectly promote social equality by reducing early-age marriage, which is a serious issue; improving female access to quality education, particularly at the tertiary level; enhancing skills; and increasing women's political representation, which will lead to gender-sensitive development programmes and policies.

Seven Challenges

Indonesia faces seven related challenges: slower economic growth, structural transformation, a low tax base, decentralisation, geography, automation, and urbanisation.

Slower Economic Growth

Economic growth has slowed since the Asian financial crisis of 1997/98. International agencies project that slower growth will continue into the distant future, and some experts say that recent growth has been lower than it should have been (Resosudarmo and Abdurohman, 2018).

Higher economic growth is important to create jobs and to accumulate resources needed to finance redistribution, social programmes, and a comprehensive national social security

system. Higher and sustained growth rates will bring more people into the middle class, which will generate savings and demand for more, varied, and quality goods.

The overall benefit of higher economic growth will depend on its sources. Numerous of studies have shown that manufacturing or industrialisation transform the economy, provides jobs, and has a multiplier effect. However, industrialisation has recently stagnated in developing and emerging countries and given rise to services sectors that are often informal and do not contribute much to the economy.

Structural Transformation

Like many other developing and emerging countries, Indonesia experienced premature deindustrialisation. Industry drove formal job creation in the 1980s and 1990s but has since been stagnant and slightly decreasing while services have predominated.

Economic structural change must promote sectors that generate growth, create jobs, and have a multiplier effect. The absence of a strong industry may pose a big challenge to Indonesia enlarging its formal sector by 2045 and providing universal workers' social protection. After the economic and political crisis of 1998, the economy suffered from more unskilled labour intensity, higher informal urban intensity, higher informal labour intensity, and higher informal unskilled labour intensity.

Low Tax Base

A comprehensive and sustained social security system requires strong tax financing. Indonesia's tax ratio of less than 11% in 2017 is lower than that of other developing and emerging countries. Of interest is the still-sizable contribution of corporate income tax and value-added tax to overall tax revenue. The contribution from personal income taxation still lags behind. More progressive tax reform to widen the personal income tax base and ensure more rigorous compliance will help Indonesia mobilise domestic revenue – a prerequisite for sustainable financing of a comprehensive social welfare system.

Decentralisation

While the central government has a strong role in redistributing income through taxation, local governments also have a redistributive impact by providing education and health

services, thereby promoting the national agenda. Decentralisation has had mixed development outcomes, however, and does not guarantee the provision of more inclusive and progressive social services such as education.

Geography

Meeting a target of zero poverty and ensuring that no children are malnourished will require access to pockets of poverty and hunger, including indigenous communities and remote islands or regions. Indonesia's vastness is a challenge to realising the Sustainable Development Goals' vision of leaving no one behind.

Automation, Robotisation, and Artificial Intelligence

The World Bank (2016) estimated that 1.8 billion jobs or two-thirds of the current labour force in developing countries are threatened by automation. The McKinsey Global Institute (2017) estimated that around half of all jobs in Indonesia could be automated using existing technologies. In a country where unskilled labour is still dominant and employment is the main driver of the income of the poor, this poses a challenge to social equality.

Urbanisation

Urban regions have higher inequality than rural ones. By 2045, almost 70% of the population will live in urban areas. By 2035, two-thirds of Indonesia and three-fourths of Java will be urban. These trends are due to people migrating from rural to urban areas for better jobs, and rural areas being transformed into urban ones. If the typical pattern of correlation between inequality and urbanisation continues, overall inequality will increase along with urbanisation.

Indonesia–Japan Cooperation in Enhancing Japan's Foreign Direct Investment and its Linkage to Micro, Small, and Medium Enterprises

Only technical progress can promote growth. It comes from investment in research and development, which has been low in Indonesia. One breakthrough is through technological spillover brought about by foreign direct investment (FDI) from more technologically advanced countries such as Japan. Indonesia and Japan should enhance their economic cooperation through FDI.

Japan's FDI should support production of industrial components. Many MSMEs produce standardised parts and components to support large industries. Existing and potential industries that can be supported by MSMEs and linked with Japanese companies should be mapped.

Indonesia–Japan Cooperation in Vocational Education and Training and Its Linkage to Industry

LaRocque (2015) pointed out that education in Indonesia does not produce an industry-ready workforce. Many employers reported that most graduates lack the required skills. Curriculums are not linked to the needs of the labour market and have not kept pace with advances in pedagogy, technology, and innovation. Equipment is old and obsolete, and workshops and learning facilities are inadequate.

The government plans to increase enrolment in senior secondary education and vocational education while aligning them more closely with national development goals. However, Indonesia still needs to develop a modern system of technical education and vocational training with strong employer engagement and national coordination (OECD/ADB, 2015).

In Japan, vocational training is provided by the state through public institutions and by private firms and authorised by the state (McCormick, 1989). The main arena for vocational training is mostly in private industry, including apprenticeship training, non-formal training centres, and enterprise-based training. Normally, four types of industrial training are provided: basic training for new recruits; updating training; upgrading training for experienced workers; and 'occupational capacity redevelopment training', which enables workers to acquire skills suitable for re-employment in case they have to

quit their jobs.

The government and private sector can initiate or enhance cooperation. Japan's long experience in vocational education, particularly government cooperation with the private sector, has valuable lessons for Indonesia.

In Japan, privately initiated vocational training within firms is incentivised by the Vocational Training Law, which says that if a corporation meets standards and obtains approval from the prefecture and municipal governments, it qualifies for financial and other assistance. Small firms, either independently or in cooperation with other small firms, can get subsidies from the central and prefectural governments amounting to about two-thirds of the running and capital costs of training. This shows that firms need incentives to conduct training and that governments – central, regional, and local – can play key role.

Local governments in Indonesia know the local labour market situation well and can tailor training not only to secure employees but also to ensure equal opportunity. Japanese firms in Indonesia can more actively enhance vocational education by offering it within their firms or by engaging with other firms, particularly local firms and MSMEs. Other avenues are apprenticeship or training cooperation. Community colleges (akademi komunitas, http://akademikomunitas.id/) provide polytechnic education (diploma 1, diploma 2), and firms can set up or help set up and implement polytechnic education to cater to industry needs.

Indonesia–Japan Cooperation to Develop Infrastructure to Mitigate Urban Social Disparity

Inequality resulting from urban development can be mitigated by providing public infrastructure that will support cities' populations at a low cost, such as mass public transportation and efficient housing. In Jakarta, for example, households spend an average of almost 25% of their disposable income on housing and transportation. Clean air regulations can reduce out-of-pocket health costs, and market connectivity will make transactions cheaper.

Towards 2045, Indonesia, particularly Java Island, will experience massive urbanisation and the emergence of larger urban areas. The Jakarta–Bandung megalopolis, for example, is the

result of the physical development of the Jakarta Metropolitan Area (JMA) and the Bandung Metropolitan Area, which form a 200-kilometre urban belt from Jakarta to Bandung, marked by a mixture of rural and urban activities that blur the rural–urban divide (Firman, 2009). Although the JMA takes up only 0.33% of the national land area, it accommodates as much as 12% of Indonesia's population and produces nearly 25% of gross domestic product.

The challenge is how to make the megalopolis more egalitarian and inclusive by ensuring that it (a) has infrastructure that can provide low-cost, reliable public goods such as public mass transportation within the megalopolis and to other regions; and affordable housing, including basic facilities such as water, sanitation, waste management, and so on; (b) has a good system to address urban-related environmental problems, particularly those related to air and water quality that have direct consequences for various health-related problems; and (c) provides quality basic education and health facilities. These are necessary to avoid the emergence of a megalopolis that is highly unequal and segregated, with low social cohesion that eventually can lead to more social problems.

Japan had a similar experience with mega-urbanisation after World War II. The formation of the Jakarta–Bandung megalopolis resembles that of the Greater Tokyo Area (which includes Tokyo metropolis, Yokohama, Kawasaki, Saitama, Chiba, and Sagamihara) and the even larger Tokaido megalopolis in the 1960s.

Japan's experience in managing massive urban development is highly relevant for Indonesia, which has started transit-oriented development (TOD), notably in the JMA. TOD will support sustainable city and urban development by spreading out economic and business centres and linking them through railway-based public transportation and connecting stations with nearby public amenities, shopping centres, office buildings, and apartments. TOD will optimise scarce land and space and support urban renewal through vertical land development, which will create settlements that are more liveable than slums.

Cooperation between government and the private sector can be enhanced in regional planning, investment, and technological transfers in areas such as railway-based public transportation, utilities, sewerage system, waste management, and others. Lessons learned from large-scale urban development cooperation on the Metropolitan Priority Area,

started in the early 2010s, can benefit future cooperation.

Indonesia–Japan Enhanced Educational Cooperation in Selected Fields of Study

Science, technical, engineering, and mathematics (STEM) education has been the backbone of Japan's technological progress. The government of Indonesia is facilitating cooperation between schools and universities with their counterparts in Japan, focusing on STEM education and research and sending students and researchers to Japan for basic and applied research.

Benefiting from Japan's Growing Employment Opportunities

With its rapidly aging and declining population, Japan needs to sustain its workforce. With its population of over 260 million, Indonesia could potentially supply Japan with much-needed semi-skilled workers, skilled industrial workers, caregivers, and hospitality workers. Indonesia and Japan should cooperate on worker training, including language training and specific standardised skills training, to enable Indonesian workers to adapt to job requirements and to Japanese society.

There are challenges. Language is a big barrier. Japanese language is not necessary for highly skilled workers, but only a handful of companies in Japan work in English. Japan also needs to do more to help integrate foreigners. By accepting only a small number of highly skilled workers, Japan has been able to get away with not having an integration policy.

Sending unskilled Indonesian workers abroad as domestic helpers will be phased out in the next few years in line with government policy. The opportunity to send semi-skilled and skilled workers abroad will relieve domestic job pressure and provide good job opportunities with excellent pay and benefits. This will translate into better welfare for workers' families in Indonesia.

Indonesia–Japan Cooperation to Accelerate Improvement in Social Security

Japan has been managing social security and universal healthcare since the 1960s, with both successes and failures. It has a great deal of knowledge on the impact of an ageing population on taxation revenue, and on expenditure and subsidies to support an ageing

population. Indonesia can learn from this extensive experience on how to sustain social security and healthcare and how to adjust and adapt to changes.

Based on Indonesia's Population Projection 2010–2035 (BPS, 2013), more than 7% of the population will be 60 years or older in 2022. By 2045, Indonesia's aging population will be even larger, with greater needs and challenges. Indonesia may benefit from Japan's knowledge and investment in, for example, health information technology.

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Challenge 9
Making the Best Use of Digital Technology to Improve People's Quality of Life

Titik Anas and Bambang Irawan

Presisi Indonesia

Introduction: Digital Technology and Our Lives

Digital technology allows a large amount of information and data to be stored in a virtual space, which can be accessed and shared in a quick and effortless manner at a relatively low cost. These developments have led to a relatively low adaptation cost of digitisation, which in turn has revolutionised our way of communicating in integrated connection networks. Digitisation has structurally transformed our economy and society (ITU, 2017).

Based on a study by the Asian Development Bank and the World Economic Forum (2017), Industrial Revolution 4.0 is shaped by the technological advancement in artificial intelligence (AI), robotics, biotechnology, block chains, quantum computing, and 3D printing. In this regard, AI is the cornerstone of most underlying digital technologies, especially robotics. The development of AI, supported by interconnectivity from the Internet of Things (IoT), will allow the production process to be automated using intelligent machines coupled with self-learning features (machine learning). This improvement will allow manufacturers to produce highly complex products or improve the quality of existing products. Meanwhile, biotechnology offers improvements to products that are related to or use living organisms in their construction, such as medicines, foods and beverages, biofuels, and other related products. 3D printing has been widely incorporated into the product design process, although its mass production capability is still far from adequate. In addition, quantum computing serves as a new tool for running new types of algorithms that are more powerful and holistic relative to previous technology. Quantum computing is expected to bring further breakthroughs in the development of new technologies, systems, and AI. On the other hand, blockchain technology has been

recently utilised to integrate records and information storage into secure networks. These developments are still being rapidly improved, thus revolutionising the whole business process.

Several studies have evidenced the apparent benefit of the adoption of digital technologies. A report by the World Economic Forum (WEF) in 2018 shows that investment in digital technologies (i.e. robotics, mobile and social media, IoT, and cognitive technologies) generates an increase in the earnings of industries. Qu, Simes, and O'Mahony (2017) estimated the contribution of digital technology (i.e. mobile phone and Internet usage) to gross domestic product (GDP) from 2000 to 2014. Although their results vary between countries, they show conclusive evidence that mobile phone usage proliferation contributes to between a 1% and 4.1% increase in GDP per capita growth, while Internet usage proliferation contributes to between a 0.9% and 9.9% increase in GDP per capita growth. In the specific case of Indonesia, Pangestu and Dewi (2017) also estimated the effect of mobile and Internet penetration as a digitalisation proxy for labour productivity in Indonesia.

Despite the advantages, the digital revolution has structurally changed the labour market composition, and some types of jobs may cease to exist because of automation or other labour-displacing technologies. An extensive amount of studies has shown that digital technology adoption, especially automation, diminishes the role of routine and manual tasks and enhances the function of non-routine and specialised tasks (Autor and Dorn, 2013; Autor, Dorn, and Hanson, 2015; Autor, Levy, and Murnane, 2003; Acemoglu and Autor, 2010). There is strong evidence of the changes in the labour market structure in both developed countries and developing countries, such as the United States (Autor and Dorn, 2013; Firpo, Fortin, and Lemieux, 2011; Autor, Katz, and Kearney, 2006), France (Harrigan, Reshef, and Toubal, 2016), Egypt (Helmy, 2015), India (Berman, Somanathan, and Tan, 2005), and other countries (Berman and Machin, 2000; Autor and Solomons, 2018; Goos, Manning, and Solomons, 2009).

Further evidence has shown a germane conclusion to the latter studies. Frey and Osborne (2017) estimated the probability of being replaced by computerisation or automation. They observed that the least susceptible jobs to automation are mostly jobs related to

specialised, personalised, and complex tasks, while the most susceptible jobs are mostly jobs related to routine, manual, and simple tasks. However, the labour-destroying effect will be balanced by emerging new jobs because of technology adoption. Acemoglu and Restrepo (2018) proposed the theory that in the long run new occupations with new tasks related to digital technology adoption will emerge and replace obsolete occupations. This theory is also further evidenced by several studies, especially for developed countries (Autor and Solomons, 2018).

In other cases, digital technology adoption also improves the livelihood of society. The widespread use of mobile phones and the Internet has contributed to a major improvement in agriculture, fisheries, tourism, education, and healthcare. The adoption of mobile phones in agriculture has shortened the supply chain by giving direct linkages from farmers to consumers, yielding higher profits for farmers and lower costs for consumers. The increased connection has enabled information sharing between fishermen and farmers alike, which creates the sharing of information related to the prices of products, market shortages, and other market information. This improves efficiency and provides a solution to the longstanding problems of market failure in the agricultural and fisheries sector. The tourism sector has also started to utilise information and communications technology (ICT) to provide real-time information about tourist destinations. Hotels and restaurants can also advertise with the addition of digital platforms related to tourism activities. Digital technology has been further utilised in healthcare as telemedicine, collaboration with offshoring doctors or medical specialists, and improvements in drugs. As for education, digital technology has gained a pivotal role in increasing the credibility and usefulness of distance learning, where distance learning can be utilised more to provide access to quality education in obscure and developing regions.

It is difficult to predict the future movement of digital technology towards 2045 as it is currently still rapidly developed and will indubitably be developed further in the future. However, there is a definite trend of increasing integration of digital technology in all elements of livelihood in society. Nevertheless, Indonesia and Japan should be more prepared and deepen their cooperation to seize the opportunities presented by digital technology adoption. Both countries also need to brace for the structural change in the labour market as a result of digital technology adoption. Robust labour market policies,

retraining programmes, and education policies will be critical in managing the changes and smoothing the impacts on the labour market.

The next section presents in detail digital technology in Japan and Indonesia and both governments' plans to develop and integrate digital technology into all aspects of society. Subsequently, we will discuss the application of digital technology in higher education. This chapter concludes with ideas on how both countries can cooperate to gain further benefits from digital technology.

Japan and Digital Technology

Current Readiness

Japan is one of the most developed countries in terms of ICT infrastructure and is even relatively higher than other developed countries. In terms of mobile broadband subscriptions, Japan led amongst other Group of Seven (G7) countries in 2017 with 157.4 subscriptions per 100 inhabitants, significantly higher than the Organisation for Economic Co-operation and Development (OECD) average of 101.8 subscriptions per 100 inhabitants. In terms of fixed broadband subscriptions, Japan is relatively comparable with other OECD countries with 30.8 subscriptions for every 100 inhabitants. Japan also has a robust infrastructure for Internet servers, with around 5,980 secure Internet servers per 1 million people in 2017, around 71% higher than the world average of 3,528 servers per 1 million people, although the figure is low compared to the OECD average. Considering the numbers, it is quite certain that Japan's ICT infrastructure is mature enough and well prepared to develop the digital economy.

However, in terms of utilisation, Japan is quite lacking relative to other developed countries, especially compared to OECD countries. While broadband subscriptions in Japan are significantly high relative to other developed countries, the access for households and individuals is significantly lagging. In 2009, only 67% of inhabitants in Japan had access to the Internet. This was far below the level of several developed countries, most notably the Republic of Korea (hereafter, Korea), which had around 94% Internet access, and some European countries, such as Ireland, the Netherlands, Sweden, Norway, and Denmark, all with over 80% Internet coverage. On a side note, however, Japan has an increasing trend for Internet access, with around a 3% increase on average from 2005 to 2009. In 2010,

households with broadband access in Japan were also significantly lower than several OECD countries, such as Korea (which had the highest level of access at 97.5%), Iceland, Norway, Sweden, the Netherlands, Denmark, and the United States (US). This result is peculiar since the share of broadband subscriptions in Japan is one of the highest amongst developed countries by a significant gap. Meanwhile, access to computers from home in Japan decreased from 2009. In 2016, access to computers from home decreased to 73% coverage, which was below most OECD countries. However, there was probably a substitution effect regarding computer usage since mobile subscriptions are increasing. There is an increasing tendency for people to use mobile devices rather than using personal computers due to accessibility issues. In general, even though Japan has high ICT utilisation, it is still lacking when compared to other developed countries.

On human capital readiness, Japan is also prominent. In 2016, around 50.5% of adults aged 25–64 years had completed tertiary education. This percentage is undoubtedly high even compared to other developed countries. Amongst OECD countries, Japan ranks second in terms of its adult education level, surpassed only by Canada. For adult education, around 60% of young people (aged 25–34 years old) in Japan have a tertiary education level, a share which is surpassed by Canada and Korea. Japan has also relatively educated elders, and only around a 20% gap persists between the education levels of youngsters and elders (aged 55–64), where 40% of elderly people in Japan have tertiary education. The high level of education is also accompanied by a high rank in STEM according to the PISA ranking, effectively making Japan one of the most prepared in facing the digital economy era. Japan's demographic issues are unlikely to hinder the development of digital technology given the large share of educated elders.

Given the robust development of infrastructure and human capital, we can expect to find that the level of research is significantly higher than in other developed countries. By looking at gross domestic spending on research and development (R&D) relative to GDP, Japan has a share of 3.1% of GDP as R&D spending, which is significantly higher than the OECD average of 2.35%. The number of researchers in Japan is also relatively higher than the OECD average, with 9.95 researchers per 1,000 people in 2016. Moreover, Japan's innovation output remains strong. Looking at patent data for 2015, Japan accounted for 17,361 patented innovations. This level of patents is the highest in the world and the country

is the largest contributor of patents amongst OECD members. To summarise, Japan ranks highly in research and patents.

With its high level of innovation, Japan remains technologically competitive compared to the rest of the world.

Challenges for Japan

Although Japan has excellent readiness and implementation of the digital economy, there are still several challenges, most notably in AI development and productivity issues that stem from the ageing population.

Japan's AI development has been lacking relative to other developed countries and even China and India. In terms of AI innovation, only 2% of research papers in AI come from Japan. Most of them come from developed countries (the US and the European Union) and China (Lundin and Eriksson, 2016), although Japan has one of the highest innovation levels. Moreover, Japanese companies have been relatively sluggish in taking advantage of AI. This fact is also reinforced by the lack of Japanese corporations at the forefront of innovation in the AI field. Based on a list of 100 leading companies in AI by Fortune, most innovation in AI comes from foreign companies, mostly US companies, with only two firms on the list originating from Japan.

This issue is exacerbated by the low IoT utilisation by Japanese companies. IoT utilisation in Japanese companies only reaches around 20%, which is relatively low when compared to the US with a utilisation rate of around 40%.[4]

Japan's issue presents a unique case since Japan is one of the leading countries in robotics development, yet this has not been accompanied by the development of AI.

In addition, productivity has become a crucial issue in Japan due to the ageing population. Japan has a clear labour shortage problem in its economy since the growth of productive workers has diminished. Based on research by the McKinsey Global Institute (2015), Japan's working age population will decline from 79 million in 2012 to 71 million in 2025, and its dependency ratio will increase from 0.60 to 0.73 over the same period. Furthermore,

[4] Referenced from https://mainichi.jp/english/articles/20180803/p2g/00m/0bu/047000c.

Japan's labour productivity growth has stagnated below 2% for the past two decades, compounded with the decline in capital productivity (the return on investment of listed non-financial companies in Japan is 23% below that of US companies). In this case, Japan needs to devise a solution for increasing its productivity and finding a new catalyst for economic growth. This problem raises urgency for the Japanese government in accelerating the development of AI to reinforce its labour productivity.

How Can Japan Catch Up?

Japan's outstanding ICT infrastructure is pivotal to the foundation of the country's digital technology reform. As shown in the previous section, Japan's ICT infrastructure is mature and on par with other OECD and developed countries and complemented with a high education level. These advantages are also coupled with low digital trade restrictiveness (Lee-Makiyama, 2018) since at least half of all trade in services is supplied via the Internet. All these aspects have led Japan to have a robust position in the digital economy.

Japan has also successfully managed to secure a major role in the digital technology business. Even with modest development in AI, Japan has managed to become one of the world's leaders in robotics development. In addition, the EU-Japan Centre for Industrial Cooperation (2015) has also noted the maturity of the use of digital technology in the business sector. The Internet usage rate amongst enterprises in Japan reached 99.9% in 2013, and e-commerce consumers reached 77 million with a market size of around €104.29 billion in 2014, accompanied by 7.1% growth between 2013 and 2014. Japan's e-commerce has also reached a noteworthy share of overseas transactions, with 10.2% of Japanese online consumers from overseas websites, mostly from the US and China. Japanese companies such as NTT DoCoMo and SoftBank have also committed to developing IoT and integrating IoT applications into their businesses.

The Japanese government has carried out several initiatives during this momentous revolution. One of the most thorough initiatives from the Japanese government is their plan for AI development. Realising the struggle with the AI development, the government has initiated a roadmap for the development and commercialisation of AI and established a Strategic Council for AI Technologies in 2016 (MIC, 2017). The development is divided into three phases. The first phase is the utilisation and application of data-driven AI in

various domains. The second phase, which is planned to start in 2020, is to propel the public use of AI and data developed across various domains. Lastly, the second phase, which is planned to start between around 2025 and 2030, is to build an ecosystem by connecting multiplying domains. The roadmap also prioritises on productivity, healthcare and welfare, and mobility as the industrialisation plan to prepare for Industrial Revolution 4.0. Another notable initiative by the Japanese government is Society 5.0, in which the government has prepared a plan to converge cyberspace and physical space to solve social issues and promote economic development. In addition, the government also plans to increase its science and innovation budget by ¥900 billion by 2020.

The growth of the AI market potential in Japan is promising. The Ministry of International Affairs and Communication of Japan has forecasted that the economic impact of AI in Japan is predicted to be ¥121 trillion in 2045 (Harris, 2017). In addition, the E&Y Institute has predicted that the AI market will grow to ¥23 trillion in 2020 and ¥87 trillion in 2030 (Lundin and Eriksson, 2016), with the largest contribution to the transportation sector followed by the wholesale and retail and manufacturing sectors. On the other hand, Japan also has globally competitive market players in AI and has been able to attract several major global AI companies to invest in Japan. Amongst the notable Japanese companies are NEC in public safety-related AI development; Fujitsu and Toshiba in manufacturing-related AI; Hitachi in machine learning; Mitsubishi and Sharp in robotics and AI; and Sony, NTT Group, SoftBank, and many more. Meanwhile, foreign companies that are active in AI development in Japan include Zen Robotics, IBM, and YouAppi.

Society 5.0 is another extensive and long-term Japanese government initiative targeted at the convergence of cyberspace and physical space.[5] It aims to improve lives by utilising the function of AI in cyberspace, which will be expected to surpass human capabilities, to give high value-added information, proposals, machine instructions, and production processes. Different from the usual common practice, which is to store information that is then utilised by people, Society 5.0 aims to create a 'super-smart' society that lets people deliver information to virtual space to be processed, following which cyberspace sends instructions and analyses or gives suggestions to machines and people. Society 5.0 will be

[5] Referenced from http://www8.cao.go.jp/cstp/english/society5_0/index.html.

focused on healthcare, mobility, infrastructure, and financial technology. The seamless integration of processing is expected to bring efficiency and solve social problems.

Indonesia and Digital Technology

Current Readiness

In facing the digital economy, Indonesia has challenges but also untapped potential at the same time. The biggest challenges for Indonesia are ICT infrastructure and human capital. These are further exacerbated by the fact that Indonesia's R&D expenditure and R&D development have remained stagnant over several years. Compounding these problems, there is also a huge digital divide in Indonesia, especially when comparing regions and diverse demographic elements. Meanwhile, Indonesia has the aptitude to adapt to new technologies and untapped potential in the form of a large and rapidly growing domestic market, especially in e-commerce, and an emerging start-up environment.

Internet access in Indonesia is far below the world average. Only around 25% of the population had access to the Internet in 2016, much lower than the global average of 45% and even lower than the other ASEAN Member States. However, Internet access has grown rapidly since 2004 and is expected to still grow in the future.

Meanwhile, mobile cellular subscriptions in Indonesia have seen remarkable growth since 2000 and passed the world average by 2008 at 59 subscriptions per 100 people. In 2016, mobile cellular subscriptions in Indonesia accounted for 149 subscriptions per 100 people, which is significantly higher than the world average of 102 subscriptions. Mobile subscriptions in Indonesia are comparable to developed countries, and even surpassed those of Japan from 2012. We will see later that the high level of mobile subscriptions influences Indonesia's development in the digital economy.

Despite the encouraging level of mobile subscriptions, Indonesia's rate of fixed broadband subscriptions is still very low. The level of fixed broadband subscriptions remained below 2 subscriptions per 100 people from 1998 to 2016. This level is much lower than the world average of 12.47 subscriptions per 100 people. In addition, the growth rate of Indonesia's subscriptions has stagnated for two decades, while other countries have significantly higher growth rates in broadband subscriptions, even relative to other comparable countries like

Thailand and Malaysia. Furthermore, there is an enormous gap in the level of subscriptions between Japan and Indonesia, where Japan is much more prominent.

Indonesia is also experiencing a digital divide, where most of the access to the Internet and ICT infrastructure is concentrated in specific areas, especially in Java's urban areas. Nevertheless, even with low ICT infrastructure, Indonesia has fast adaptation and high savviness regarding digital technology, especially on the consumer side. This has resulted in a robust start-up environment in the big cities. E-commerce and the sharing economy are growing at a fast pace in Indonesia, mostly due to the high adoption of mobile phones and consumers' savviness with technology. Several start-ups have become competitive market players regionally in ASEAN, such as Go-Jek, which has started to expand its business to other ASEAN countries, such as Viet Nam; Bukalapak and Tokopedia, which are major players in ASEAN; and Traveloka.

Box 9-1. E-commerce

Indonesia's recent developments in the digital economy are defined by the e-commerce sector. Based on a report by McKinsey & Company (2018), Indonesia's e-commerce gross merchandise value in 2017 reached above US$8 billion, and the growth has been astoundingly high since 2015, at around 100% annually. Most shares of e-commerce sales were generated from e-tailing, which includes all transactions from online marketplaces, amounting to around US$5 billion. Meanwhile, transactions from social commerce, such as Facebook, Instagram, Line, and WhatsApp, also contribute to large e-commerce activities worth over US$3 billion. However, e-tailing's contribution to total GDP is still low, with only a 0.5% contribution in 2017.

E-commerce activities in Indonesia are also extremely vibrant, especially in Southeast Asia, as consumers are increasingly comfortable with utilising online marketplaces. Based on an iPrice Insights (2017) report on e-commerce in Southeast Asia, Indonesia has a significantly high usage share of mobile traffic for e-commerce activities. It had a staggering 87% share of mobile traffic in 2017, followed by Thailand and the Philippines.

People in Indonesia are also more willing to buy products after visiting a website or platform from an online marketplace relative to other ASEAN countries. Indonesia ranks second in conversion between accessing websites to purchasing products, surpassed only by Viet Nam.

The Digital Divide: A Major Concern for Indonesia's Digital Technology Adoption

Despite the vigorous state of e-commerce, Indonesia is plagued by the digital divide. To begin with, by observing the regional 2016 ICT Development Index, we can see there is a huge gap between Java and the eastern Indonesian regions. Papua and Maluku generally receive significantly lower scores relative to regions in Java, such as DKI Jakarta, DI Yogyakarta, Bali, and Banten. However, other regions outside Java are also found to have higher than average scores, such as several regions in Kalimantan. As the ICT Development Index is measured by access and infrastructure, ICT usage, and skill, it is obvious that ICT development is bogged down by the huge gaps in infrastructure development and education levels.

Uneven Internet coverage and download bitrate capacity further reinforce Indonesia's digital divide. Internet coverage is still concentrated much more in Java Island than in the other islands. Significant areas in Papua, Kalimantan, Maluku, Sulawesi, and Sumatera do not even have access to 2G. Meanwhile, 4G and 4G+ access is still highly limited, and 4G+ is only accessible in several urbanised regions in Java. On the other hand, the download bitrate capacity in Indonesia is extremely low, except for several regions in Java. In all areas in Papua, the download bitrate is still lower than 5 megabytes per second.

There is a massive challenge for Indonesia's digital technology development. The current ICT infrastructures have shown to be extremely inadequate, and the problem is coupled with a lack of education to prepare human resources to deepen the integration of digital technology. In short, the Indonesian government has a huge task in preparing its country to avoid getting left behind in the huge global digitisation wave. In its current condition, digital technology will only be utilised by a few groups of people, especially in the highly urbanised and developed areas of Java, and the development of digital technology in Indonesia will stagnate without extreme measures for improvement. Indonesia needs to focus on increasing its investment in ICT infrastructure (including electricity), address the regulatory impediments to ICT development, and increase investment in human capital, especially for digital skills.

Digital Technology in Higher Education

The role of ICT in higher education has been well documented. A study by the OECD (2016) shows how new innovations have influenced how lessons are delivered in higher education institutions. It describes how ICT technologies have allowed for greater learning experiences for both students and lecturers through the development of online (virtual) laboratories, greater collaboration amongst international participants in research and learning, and more interactive discussions and monitoring by the lecturers of the students' development, which have opened greater access to women and people with disabilities.

Indonesia established the Open University (Universitas Terbuka, UT) in 1984. It is arguably the first institution in Indonesia to offer distance education services and has become the leading institution in Indonesia providing education for people who cannot dedicate their time to attend traditional classes at the university level or for people living far from a physical university. Currently, more than half of the total students (62%) attend the faculty of teaching and education (FKIP), and the same percentage of them are actually teachers by profession. In the early stages, the UT packaged its learning materials in the form of printed modules for students to learn independently, supported by TV and radio programmes. With the advancement of technology, particularly ICT, the tutorials can take place online using the Internet, allowing for more interactive discussions between students and lecturers, and the materials are available in digital form. In addition, the UT now has its own YouTube channel, an online UT radio, and an Internet-based TV channel.

Given this development, the Indonesian government, through the Ministry of Research, Technology and Higher Education (Kemenristekdikti), has encouraged more institutions to develop their online degree programmes. Currently, there are 51 higher education institutions that are permitted to offer online programmes (19 public institutions and 32 private). Consumers will have more to choose from, access for everyone will become greater, and women and people with disabilities will benefit from higher enrolment rates.

Digital Technology in the Health Sector

Digital technology has also changed the way health services are delivered. E-health has improved the efficiency and effectiveness of health care provision (Kristianto, 2013). Electronic Health Records (HER) for example, have mostly been implemented in

developed markets. However, the adoption of these digital records is costly.[6] PWC (2016) shows that the adoption of traditional EHR is still low in emerging markets, and Indonesia is amongst the lowest of the emerging countries. Apart from the cost, resistance from users is also an issue in developing countries. Jember Pulmonary Hospital in Indonesia, for example, implemented a computer-based digital system in 2005. However, it was not successful as the participation rate was too low. In 2013, the hospital modified its digital system using tablets and called the digitisation programme Hospital in Tablet (HoT) to increase the willingness of doctors to fill in the electronic medical records correctly, completely, and on time.

Nugraha and Aknuranda (2017) show the evolution of IT used in the health sector from satellite-based health services in the early years of digital health to mobile and Internet-based services, such as teleconsultation, telediagnosis, telecoordination, tele-education, drug databases, tele-biomicroscopy, and tele-education. Ariani et al. (2017) shows how m-health, defined as the use of portable devices (short messages or text messages, voice calling, and wireless data transmission) are used in delivering medical and public health services with the enormous potential to reduce costs, advance health information exchange, and improve healthcare access (Betjeman et al., 2013; Wittet, 2012). Although the use of digital technology in Indonesia has increased over time, as PWC (2016) describes, the adoption in general remains low.

In contrast, Japan has one of the highest levels of adoption of digital technology in healthcare services. The Japan Medical Association (2017) indicates that Japan adopted electronic medical records (EMR) in 1999. In 2001, the Japanese government allowed health institutions to use EMR without producing printed records at all. In 2006, ICT became the priority for the structural reform of healthcare policy. Japan has a national health database, including EMR data, insurance claims, and health check-up data. The World Health Organization (2018) indicates that Japan will implement an integrated community care system by 2025. The system will be basically a comprehensive system at

[6] The United States Congressional Budget Office (CBO) reports that, on average, EHR implementation costs for hospitals amount to approximately US$14,500 per bed with annual operating costs of US$2,700 per bed per year.

the community level that integrates prevention, medical services, and long-term care while also providing living arrangements and social care. The introduction of robots in the health sector is also reported by Deloitte (2017). Japan's Toyohashi University of Technology has developed Terapio, a robot that can carry out routine hospital tasks, such as making hospital rounds, delivering medications and other items, and collecting records. For now, the robot follows a nurse or other medical staff.

How Is Indonesia Catching Up?

The Indonesian government has initiated several plans to tackle the seemingly insurmountable issues. One of the most momentous plans by the government is the Palapa Ring initiative, which serves as a major improvement for ICT infrastructure, specifically in fibre optic extension.

The Palapa Ring initiative targets the construction of 36,000 kilometres (km) of fibre optic cables that connect all major Indonesian islands and integrate with existing networks. The initiative aims to cover 440 cities and municipals in Indonesia. Specifically, the Palapa Ring initiative also aims to build a fibre optic network in the eastern part of Indonesia (under the Palapa Ring-East plan) and integrate it with the existing networks in other parts of Indonesia in 2019. Palapa Ring-East will consist of 3,850 km of submarine cable and 600 km of land cable to cover 21 cities and municipals.

Outside of the Palapa Ring initiative, the Indonesian government has also made an effort to extend the fibre optic network through Telkom Indonesia, a state-owned enterprise in the ICT sector. In 2015, additional fibre optic cables in eastern Indonesia were built by Telkom Indonesia to connect Sulawesi, Maluku, and Papua under SMPCS Packet-1, and all around Papua, including the surrounding islands, under SMPCS Packet-2. In May 2018, Telkom Indonesia finished building a fibre optic cable network as a joint project with international and ASEAN consortia. The network connects Java, Bali, Sumatra, Singapore, Eastern Kalimantan, and Sulawesi under one network called the Indonesia Global Gateway system.

The broadband development efforts by the government will be crucial in preparing Indonesia for the adoption of digital technology as broadband infrastructure is still used as a pivotal foundation for the underlying development of all digital technologies. The improvement in broadband coverage to include all of Indonesia, coupled with the

government's plan to reinforce education and skills, will allow Indonesia to join the global digitisation wave.

Japan–Indonesia Cooperation

Digital technology is a new hope for Indonesia to accelerate the process of more equitable development as it will help narrow the development gaps between the more and less advanced parts of Indonesia. However, Indonesia is currently lacking the digital technology success factors: infrastructure and human capital. To address these issues, large investments are required, both in ICT infrastructure and human capital.

Based on the analysis in this study, we suggest that Japan and Indonesia can strengthen cooperation in several areas. First, Japan's overseas investment and development assistance can be channelled into ICT infrastructure development to allow Indonesia to close the digital divide more quickly. This will mutually benefit both countries – Indonesia can increase its ICT infrastructure capacity, and Japan can channel its investment into a fast-growing digital economy.

Second, Japan and Indonesia can work together to improve Indonesia's human capital, particularly improving the skills required to work with advanced technology and develop future technology, which are currently relatively scarce in Indonesia. Regarding higher education, drawing on one of the case studies we highlighted in this study, we recommend cooperation in improving Indonesia's quality of distance learning services. Distance learning has been and will be an important way of providing better access to education for people living in Indonesia's less developed regions. Specifically, we recommend cooperation with Japan for the content development of online courses. For vocational education, cooperation with Japan is also important. Learning about and potentially adopting the Japanese curricula might increase Indonesia's vocational training compatibility with industries' needs, particularly Japanese manufacturing in Indonesia.

Third, Indonesia should cooperate with Japan to learn from the country's advanced adoption of digital technology in healthcare services, such as integrated healthcare information systems. The integrated healthcare information system in Japan has improved the efficiency and effectiveness of healthcare services. In this study, we showed that some hospitals in Indonesia have implemented digital technology to improve the efficiency and

effectiveness of their services. However, digital technology adoption is still rather limited. Cooperation with Japan would allow Indonesia to accelerate the establishment of an integrated system.

Last but not least, we recommend cooperation in R&D. With Japan's R&D in advanced ICT future technologies, collaborative and joint research projects between Indonesia and Japan's research institutions and universities will contribute to the greater involvement of Indonesia's research in future technology.

Taking into account Indonesia's digital divide, we also recommend that the cooperation between Indonesia and Japan should not only focus on the advanced regions of Indonesia, such as in Java Island, but also on the less developed regions.

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Challenge 10
Strengthening Resilience to Natural Disasters, Tackling Climate Change, and Managing Natural Resources

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Indonesia's constitution stresses that economic development must be sustainable. Indonesia needs to develop a resilient, sustainable, and prosperous society. Indonesia and Japan should consider three global commitments or pillars: the Sustainable Development Goals, the Sendai Framework for Disaster Risk Reduction, and climate change adaptation and mitigation. This section explores the key elements of future challenges: strengthening resilience to natural disasters, tackling climate change, and managing natural resources.

Strengthening Resilience to Natural Disasters

Strengthening disaster resilience by mainstreaming disaster risk reduction into sustainable development and poverty reduction is essential and urgently needed in Indonesia. The country, geologically and geographically, is prone to natural and man-made calamities. Earthquakes, tsunamis, floods, and landslides have frequently occurred in recent times in most parts of the country. Indonesia is vulnerable to coastal hazards, hydro-climatic hazards, and the effects of climate change. This condition is exacerbated by inappropriate development activities, including rapid resource exploitation, forest degradation, and urbanisation.

A huge number of lives and enormous amounts of property have been lost to disasters, which have increased by about 10% in the last 10 years. About 155 people die every year, mostly women and children. The large number of victims is closely related to their socio-cultural – particularly their socio-religious – background. Women face enormous problems during and after disasters, including meeting female-specific needs

(reproductive health and cultural and religious practices) and swapping gender roles, especially for those who have lost their husbands. Gender is still an important issue in disaster management.

Mainstreaming disaster risk reduction addresses risk issues in strategic development frameworks, legislation, sector strategies and policies, and budgets. The main objectives are to (a) reduce disaster risk accumulated from previous development; (b) avoid creating new disaster risk; and (c) build the capacity to respond to any type of emergency based on social, economic, and environmental impact assessment; land-use policy and planning; and building codes and standards.

The initial stage of mainstreaming disaster risk reduction focuses on increasing disaster preparedness and strengthening risk culture. However, the terrible loss of life during disasters shows that the people and the government are not prepared. This condition also indicates that previous disasters have not increased community awareness and preparedness.

Various initiatives to increase community awareness and preparedness have been executed throughout Indonesia since the Aceh tsunami of 2004. Education and preparedness activities and channels, formal and non-formal, have been developed by disaster education groups and stakeholders. Although their knowledge has increased, however, it is still insufficient and mostly not followed by preparedness actions because the risk culture has not been fully established even amongst those who live in high-risk areas.

Awareness and preparedness are also lacking amongst policy planners and decision makers. The Indonesian Institute of Sciences (Lembaga Ilmu Pengetahuan Indonesia [LIPI]) found that seven out of nine districts and cities had limited capacity to increase preparedness. They had inadequate policies and guidelines; lacked a warning system, particularly in communities; and had limited training, drills, technical resources and materials, and institutional and financial arrangements. They had emergency plans but none that

achieved the 'prepared' level. Increasing preparedness was not a priority because the main concern was still post-disaster management.

Enhancing disaster preparedness and strengthening risk culture remains critical. What is being learned is the capacity to live with uncertainty and risk. Public education and community preparedness need to be developed based on integrated sciences and life skills, joyful learning, local needs, and a community participatory approach. A more comprehensive action plan needs to be carried out to meet people's urgent requirements, enliven local wisdom, and utilise local resources.

Local wisdom can increase community efforts to find relief and recover from disaster. Knowledge, values, and action need to be developed in harmony to enhance individuals' and groups' capacity to reduce disaster risk and build disaster resilience. Smong, for example, is a natural warning system that saved most of Simeulue Island, Aceh, from the giant tsunami in 2004.

Previous disasters show that most victims are poor and vulnerable and that building their resilience is important. The main objective is to prevent future disasters from pulling more people into poverty, to protect their livelihoods and assets, and to help them recover from disaster. Resilient infrastructure, especially houses and basic services, must be built. These measures can be implemented through inclusive policy design, which is critical to reducing poverty and achieving the Sustainable Development Goals.

Increased capacity and social protection initiatives are likely to reduce poverty and risk. These efforts must be integrated into policies and programmes for sustainable development and poverty reduction. The Javanese in the district of Bantul, Yogyakarta, used local wisdom such as community self-help (tolong menolong), mutual help and cooperation (gotong royong), and fund raising (jimpitan) to survive the devastating earthquake in 2006 and reduce the risk of further disaster impacts. Social capital can be applied to strengthen a community's disaster preparedness and potential to recover.

Developing mitigation strategies with clear links to functional lead institutions is crucial. Disasters inflict great damage on infrastructure and property, especially buildings that do not meet code standards, interrupting vital services and threatening the sustainability of economic activities. Strategies should be based on land use and physical, socio-economic, and investment plans within a development framework. Policy guidelines and planning measures need to be developed through a national framework and disseminated to the regional and local levels.

Developing a mitigation framework remains a challenge for the national, regional, and local governments. Despite the wide-ranging and multi-sector nature of disaster risk reduction, its elements have not been integrated into development planning. Disaster risk management is included in the 2015–2019 National Medium-Term Development Plan and in Nawa Cita, a nine-pillar development programme, and is supported by Law No. 24 (2007) and Government Regulations (2008). However, implementation is limited, mainly because disaster mitigation is still viewed as the responsibility of the National Disaster Management Agency (Badan Nasional Penanggulangan Bencana [BNPB]) rather than a cross-cutting sector issue that should be integrated into national, regional, and local government development plans.

Building resilient infrastructure, especially essential facilities (schools, hospitals, water, roads, power, communication), is a basic requirement of sustainable development. The structural designs of the built environment and hazard-based land use should be improved to avoid or manage risks. The fact is that many development and investment (public and private) plans are not designated in the spatial plan. Revision of land use, regulations, and building codes is essential. Enforcement of the laws requires inter-sector coordination and alignment of plans.

After the Aceh tsunami, Indonesia shifted from post-disaster management to prevention, preparedness, and mitigation, but the new paradigm has not been fully implemented. The disaster management agency and other government institutions still rely heavily on

emergency response and post-disaster rehabilitation and reconstruction. The role of government and agencies in charge, as the primary stakeholders, in increasing community preparedness and mitigation is still limited, especially at the regional and local levels, mainly due to their limited capacity, including inadequate understanding and awareness of the hazards and the importance of community preparedness and risk reduction, and their limited budget and staff.

A close correlation between disaster events and poverty underlines the need for an overall national framework to reduce disaster risk, especially casualties and economic damage and losses. Development policies and programmes should clearly define risk reduction objectives, commit to gender sensitivity, and ensure that policies and programmes do not create new risks.

These policies and programmes of work need to be included in government budgets. The budget for disaster management is provided for in Article 5 of Law No. 24 (2007) and in Government Regulation No. 22 (2008) concerning funding sources. However, the implementation of disaster risk reduction programmes is still lacking, with only a few national, regional, and local institutions explicitly noting it in their work programmes or budgets. Budgetary allocations for post-disaster response require a new scheme for handling large-scale disasters that require substantial funding, especially for rehabilitation and reconstruction.

Disaster risk reduction can be mainstreamed into sustainable development with support from regional and international partnerships, especially with Japan. Japan and Indonesia are both disaster prone, often experiencing earthquakes, tsunamis, and volcanic eruptions. Japan and Indonesia could share data, set up regular seminars or discussion forums, develop assessment approaches and tools, and conduct risk assessments. Japan might also help Indonesia strengthen its tsunami early warning system by providing technologies for communities; build a risk culture embedded between the people and government; increase women's participation in disaster management and raise awareness of gender relations in

disaster risk reduction; enhance the capacity of policy planners and decision makers; and strengthen disaster risk prevention, mitigation, preparedness, response, recovery, and rehabilitation at the national, regional, and local levels.

Tackling Climate Change

Climate change is a significant challenge to development. Its impacts are twofold: meteorological hazards could undermine development achievements and degrade the quantity and quality of natural resources. Projections show that Indonesia's average temperature would increase at a similar rate as average global warming, while the average annual precipitation would not change significantly. Indonesia would benefit from less rain, but increased evaporation due to higher temperatures would decrease surface water. Indonesia will need to pay greater attention to potentially more extreme meteorological events that could increase risks of climate-related disasters.

Indonesia also has limited land, with intensely competing demands to use it for settlement and development or to maintain the ecosystem services that are vital to support people's lives and livelihoods and protect them against the changing climate.

Indonesia has many policies and initiatives to tackle climate change. The most significant are the following:

- **National Action Plan for Climate Change Adaptation**. Published in full in February 2014, it aims to establish a national adaptation plan of action to implement sustainable development with high resiliency to climate change.
- **First Nationally Determined Contribution (NDC).** Submitted to the United Nations Framework Convention on Climate Change in 2016, it expresses commitment to low-emission and climate-resilient development, joining the effort to avoid a global temperature increase of 1.5°C above the pre-industrial level. Indonesia is committed to reduce greenhouse gas

(GHG) emissions by 29% by its own efforts and by 41% with international support, against the business-as-usual trajectory baseline, by 2030.

Indonesia has developed adaptation-supporting data and tools to facilitate community and regional climate change adaptation plans and vulnerability assessments. The important ones are climate change projections based on representative concentration pathway (RCP) 4.5 and RCP8.5 scenarios, and the Data Inventory System of Vulnerability Indices (Sistem Informasi Data Indeks Kerentanan [SIDIK]).

Based on the NDC, national GHG emissions in 2010 were estimated at 1.33 $GtCO_{2(eq)}$. With business-as-usual trajectories, emissions are expected to reach a level of 2.869 $GtCO_{2(eq)}$ in 2030. Sectors that significantly contribute to reducing emissions are forestry (17.3% under 29% commitment, and 22.7% under 41% commitment) and energy (10.9% under 29% commitment, and 13.9% under 41% commitment).

Ecosystem services provide economic and livelihood opportunities at the community and industrial levels. A suggestion is to shift the economy from natural resources (ecosystem) exploitation to ecosystem services adding value to ensure more sustainable development. Many ecosystem services are site specific, providing an opportunity to become globally competitive.

The following are recommended sector initiatives and actions:

Climate Change Adaptation

- **Health.** Enhancement of disaster risk reduction, including development of infrastructure for better protection and stronger disaster, land, and sustainable forest management.
- **Ecosystems.** Enhancement of the ecosystem's adaptive capacity to reduce the potential loss and damage of ecosystem services resulting from extreme events and changing climatic conditions. This can be promoted as an integral part of ecosystem-based adaptation, which involves sustainable

management; conservation and restoration of ecosystems; introduction of technology to increase ecosystem functional capacity; and social aspects, including socio-economics, culture, individual and societal capability to adapt, institutional capacity, amongst others.

- **Clean water.** In addition to better water resources management, water purification technology to optimise use of water, including recycled water.
- **Agriculture.** Enhancement of agriculture productivity through intensification, and wide introduction of integrated farming that promotes self-supported production of organic fertiliser for small-scale farming.
- **Fisheries and marine production.** Development or introduction of technology and advanced tools of safer fishing boats. Promotion of fish domestication and aquaculture to increase productivity.
- **Forestry.** Enhanced conservation and forest adaptive capacity, and domestication of forest products to avoid or reduce potential loss of forest-provisioning services.

Climate Change Mitigation

- **Forestry.** Strengthening and extension of existing policies described in the NDC. Options are continuing the forest moratorium policy to 2030 and expanding it to include secondary forests and forest areas under concession licenses, and restoring an additional 4.6 million hectares of degraded forest and peatland.
- **Energy**. Implementation of the National Energy Policy and the Energy Conservation Policy.

Managing Natural Resources

Indonesia has abundant natural resources but they are not distributed uniformly across the regions. Indonesia has not fully managed its natural resources in a sustainable way. Rapid

depletion of natural resources and environmental degradation have reduced long-term prospects of economic growth.

Natural resources still contribute about 25% of gross national product. This can bring several risks. First, the benefit of natural resources depends on global commodity prices. Second, increasing production of natural resources, especially coal and palm oil, raises environmental concerns. Finally, increasing commodity exports has limited impact on employment. Other risks include 'boom and bust,' Dutch disease, being trapped in low-value-added production, and rent-seeking behaviour.

Generally, economic development needs to take into account the availability of land, water, energy, forests, food, and fisheries because they can constrain demand and impede economic and social change. Carrying capacity must, therefore, be internalised or even mainstreamed into the development model. Government needs to pursue policies that encourage natural conservation and efficient use of resources.

Indonesia has comprehensive institutions to promote sustainable development, but the challenge is how to integrate and consistently implement regulations. Lack of law enforcement and ecology education is a problem. Four policy interventions are needed: increasing reforestation and decreasing deforestation, increasing the quality of natural resources, developing efficiency in agriculture and in the use of natural resources, and increasing the use of renewable energy and energy efficiency.

Indonesia needs to widen and broaden its pursuit of sustainable economic development by creating institutions that mainstream sustainable development and by involving all members of society. Survey data in 2017 show, however, that provinces with higher incomes were less concerned about the environment. Only leadership concerned with long-term development rather than a narrow political agenda can transform a mentality of exploiting natural capital to one that is open to innovative ways of developing sustainable renewable resources. In the current economic structure, this is a challenging task.

In agriculture, it is imperative to increase economies of scale by promoting cooperative or village farming, scaling up farmers' technology capability, developing seeds for highly productive crops and foods, and supporting land management, especially of neglected land. Smart and precision farming can produce maximum yields. These principles aim to create a supply chain that can bring small-scale farmers into the mainstream regional economy. The new ecosystem depends on collaboration amongst multiple actors, and collaboration requires trust.

Promoting renewable biological resources to reduce dependency on fossil fuel, as well as food, animal feed, and other bio-based products is the basis for a bio-economy. Biotechnology and biomass can solve global resource shortages. Further advances in biotechnology, digital technology, nanotechnology, neurotechnology, green technology, and others need to be developed. Two options can be promoted in the electricity sector: (a) stabilise the growth of steam coal power plants and (b) increase the share of new and renewable energy.

As people become more mobile on a massive scale, they will need public transport, clean water, telecommunication, sanitation, waste management, and energy. The challenge is how to expand economic benefits not only in the cities but also in the periphery and rural areas. Two upstream elements need to be prepared: application of geospatial policies that consider the resources and capacity of every region; and estimation of data analysis risks, which is important in preparing insurance due to potential damage.

Cities' expansion has increased paddy-field conversion for other purposes, especially housing, business districts, and industry. To maintain and increase environmental services and to control conversion of fertile land, the government needs to monitor land use and strengthen law enforcement against violations. Promoting the biosphere reserve is one strategy to protect environmental services. The challenge is how to develop this activity so that it is economically and socially beneficial.

Advancing Collaboration Between Indonesia and Japan

Indonesia and Japan can develop cooperation in several key areas. First, they need to prepare a broad-based framework and approach to build a resilience culture and to promote low-carbon development, ecosystem-based development, a bio-economy, and climate change adaptation and mitigation. Second, both countries should manage the knowledge in the many studies they have produced and in the data collected on disasters, the climate, and resources, and optimise this knowledge by supporting the technocratic development process. Third, the capacity of local people must be built and knowledge transferred to them with the participation of more actors. Fourth, the tsunami early warning system must be strengthened with appropriate technology. Fifth, Indonesia and Japan can work together to develop smart and precise farming practices that meet local needs. Sixth, both countries have collaborated on the bio-economy for energy, waste, and other sectors, and must now expand and replicate the research or pilot projects that will result in action at the commercial level. Finally, Indonesia and Japan can develop more understanding on how to develop sustainable cities. Japan was a pioneer in this area and Indonesia can learn much from Japan's many experiences and minimise its own failures.

Conclusion

Our dream is to create a life of plenty, freedom, and safety in a society that is peaceful, stable, democratic, diverse, and tolerant. To achieve this dream, we identified three targets – to uphold democracy and become maritime global powers, to be in the GDP top 5, and to achieve a high quality of life beyond the SDGs 2030. The 'Challenges' and policies to achieve these goals are discussed in the preceding chapters.

The chapters have some common elements – human resource development, maritime aspects, utilisation of digital technology, and infrastructure development.

Human resource development is the foundation of maintaining democracy, contributing to the international order, developing the manufacturing sector and other industries, and reducing social disparity.

Maritime aspects are also emphasised in this report. Japan and Indonesia should contribute to keeping maritime space as an open and inclusive zone. Maritime related industries have greatly contributed to both the Japanese and Indonesian economies. Sustainable use of marine resources will contribute not only to the environment, but also to the economy.

Digital technology has a big impact on our society. Cyber security is an emerging issue. Moreover, some jobs will be diminished because of artificial intelligence and other digital technologies. But digital technologies, especially, communication technology, can also contribute to disseminating quality education to remote areas, to reducing urban congestion through teleworking, and to improving disaster resiliency through use of early warning systems. It is also a base for Indonesia and Japan to be a part of global supply chains. Thus, human resource development for the digital era is vital both in Indonesia and Japan.

Infrastructure development is also important. Use of digital technology in remote areas is still limited, because the infrastructure is not ready. Infrastructure for transportation such as airports, ports, roads, and railways, and for energy supply including renewable energy supply are also important for economic development, sustainability, and quality of life in rural areas.

To help shape our common futures, the Executive Committee of Project 2045 agreed to propose joint flagship projects to the Indonesian and Japanese governments (see Annex). The members also agreed on the need to set up a joint follow-up committee to facilitate the realisation of joint projects, to review the progress of cooperation between Indonesia and Japan, and to make further recommendations.

Annex: Joint Flagship Projects

To Uphold Democracy and Become Maritime Global Powers

1. Promote peace and prosperity in the region as maritime powers through:
   - co-hosting a multilateral ministerial forum to promote freedom and safety of navigation and flight in the Indo-Pacific Region;
   - capacity building for upholding the rule of law incl. UNCLOS;
   - strengthening coast guard capabilities;
   - enhancing connectivity and Maritime Domaine Awareness (MDA) through information sharing and transfer of technology, skills, and equipment.
2. Enhance moderate Islam in and beyond Indonesia through cooperation for strengthening higher education such as UIII.
3. Donor to Donor coordination not only for the Middle East but also for Africa, the Pacific Islands, etc.

To Be in the GDP Top 5

4. Enhance systems for human resource development to achieve US$30,000 per capita GDP in Indonesia by:
   - founding 'KOSENs' (Japanese version of polytechnic);
   - creating a network for vocational training of Pesantren students;
   - strengthening on-the-job training by the private sector in both countries.
5. Launch a joint study for boosting export of products made in Indonesia through free trade promotion, infrastructure development, and foreign direct investment.
6. Make use of enhanced connectivity of the digital revolution era in such areas as incubation and education for remote islands.

To Achieve Quality of Life beyond Sustainable Development Goals 2030

7 Achieve clean and smart life by establishing a master plan and jointly model Smart City projects for suburbs, tourism, and remote islands.

8 Establish safe and rich food-life with sustainable supply of fresh and diverse local products through creating cold chains and local brand development.

9 Realise universal health coverage and care-service for aged persons through:

- creating model projects for remote diagnosis by utilising artificial intelligence;
- introducing the Japanese care system, etc.

10 Improve Resilience to natural disasters through use of early warning systems.

Record of High Level Seminar

8–9 December 2018

Dharmawangsa Hotel

Jakarta

After 3 months of intense preparation, a high-level, two-day seminar took place on 8–9 December 2018 at the Dharmawangsa Hotel in Jakarta. This seminar, which received substantial exposure in Indonesian and Japanese media, was co-hosted by the Embassy of Japan and the United Nations Development Programme (UNDP) in cooperation with the Economic Research Institute for ASEAN and East Asia (ERIA). UNDP Country Director, Mr. Christophe Bahuet, stated in his remarks that the role of Indonesia and Japan in enhancing democracy and development is very meaningful for each country, as well as for the regional and international community. The launching of Project 2045 marks a mutual milestone for Indonesia and Japan. In a speech, reception attendee H.E. Drs. H.M. Jusuf Kalla, Vice President of the Republic of Indonesia, emphasised that there should be periodic review of Project 2045, and that the cooperation to achieve it should be based on mutual benefits, sincerity, and respect for each other's national development goals.

Purpose

This seminar aimed to disseminate research on the 10 challenges for, and areas of potential cooperation between, Indonesia and Japan, and to discuss the way forward by bringing in selected prominent speakers and experts. The seminar invited high-level officials to raise awareness and provide insights to concrete policy reforms regarding Indonesia's vision for 2045. The seminar was also held to commemorate the 60th anniversary of Japan and Indonesia's bilateral partnership.

Agenda

The seminar was divided into three sections: the first day included an opening session, with opening remarks from UNDP Country Director, Mr. Christophe Bahuet; opening remarks from Mr. Teru Fukui, a member of the House of Representatives who came on behalf of Mr. Toshihiro Nikai, the Secretary General of the Liberal Democratic Party of Japan; a keynote speech from Prof. Dr. Ir. Ginandjar Kartasasmita, Chairman of the Indonesia-Japan Friendship Association; a keynote speech by the Minister of National Development Planning (BAPPENAS) H.E. Mr. Bambang Brodjonegoro, followed by panel discussions on the topics 'Projection of Indonesia and Japan in 2045', and 'Cooperation between Indonesia and Japan for 2045'. The first panel discussion was moderated by Dr. Takashi Shiraishi, Chancellor of the Prefectural University of Kumamoto, and featured Prof. Hidetoshi Nishimura, ERIA President Director, H.E. Mr. Masafumi Ishii, Ambassador of Japan to the Republic of Indonesia, Dr. Ken Jimbo, Professor of Keio University, and Mr. Bambang Prijambodo, Senior Expert of BAPPENAS. The second panel discussion was moderated by H.E. Mr. Muhammad Lutfi, former Ambassador of the Republic of Indonesia to Japan and featured key experts: Mr. Edi Yusup (Director of East Asia & Pacific, Indonesian Ministry of Foreign Affairs), Dr. Koki Hirota, Professor of Saitama University Japan, Mr. Hirofumi Takeda, President of Jakarta Japan Club, and Mr. Rosan Roeslani, General Chairman of KADIN.

The second session was the most important part of the seminar, with a ceremony of the submission of the Project 2045 Report and a dinner reception. H.E. Drs. H.M. Jusuf Kalla attended the ceremony and gave a speech highlighting the importance of Japan and Indonesia's relationship and what the two countries can do together in the future. The official Project 2045 video was also played, as well as the ERIA 10th Anniversary video. The next day, one full day of panel discussions continued. There were three parts to the symposiums that covered the following three objectives: (1) To uphold democracy and become maritime global powers; (2) To be top 5 GDP; and (3) To achieve a high quality of life beyond the SDGs. Ministers, experts, and professors attended to present and discuss the relevant topics of each symposium.

AGENDA OF HIGH LEVEL SEMINAR PROJECT 2045

Venue: Dharmawangsa Hotel, Garden and Nusantara Ballroom

Saturday, 8 December 2018

OPENING SESSION

14:00–14:10	Opening Remarks by Mr. Christophe Bahuet, Country Director of United Nations Development Programme (UNDP)
14:10–14:20	Opening Remarks by Mr. Teru Fukui, Secretary General, Headquarters for Promoting the Establishment of a Disaster Resilient Japan, Member of the House of Representatives (On behalf of Mr. Toshihiro Nikai, Secretary General of the Liberal Democratic Party of Japan)
14:20–14:30	Keynote Speech by Prof. Dr. Ir. Ginandjar Kartasasmita, Chairman of Indonesia-Japan Friendship Association
14:30–14:50	Keynote Speech by H.E. Mr. Bambang P.S. Brodjonegoro, Minister of National Development Planning of the Republic of Indonesia / Head of BAPPENAS
14:50–15:00	Photo session
15:00–15:50	Panel Discussion 1: Projection of Indonesia and Japan in 2045
	Moderator : Dr. Takashi Shiraishi, Chancellor of the Prefectural University of Kumamoto
	Panelists : Prof. Hidetoshi Nishimura, President of Economic Research Institute for ASEAN and East Asia (ERIA), H.E. Mr. Masafumi Ishii, Ambassador of Japan to the Republic of Indonesia, Dr. Ken Jimbo, Professor of Keio University, and Mr. Bambang Prijambodo, Senior Expert of BAPPENAS
16:00–16:50	Panel Discussion 2: Cooperation between Indonesia and Japan for 2045
	Moderator : H.E. Mr. Muhammad Lutfi, Chairman of the Japan Indonesia Bilateral Committee of the Indonesian Chamber of Commerce and Industry (KADIN) and Former Ambassador of Indonesia to Japan

	Panelists :	Mr. Edi Yusup, Director of East Asia & Pacific, Ministry of Foreign Affairs, Dr. Koki Hirota, Professor of Saitama University, Mr. Hirofumi Takeda, President of Jakarta Japan Club, and Mr. Rosan Roeslani, General Chairman of Indonesian Chamber of Commerce and Industry (KADIN)
17:00–17:20	Press Conference by Co-Chairs Participants: Dr. Takashi Shiraishi, Chancellor of the Prefectural University of Kumamoto, H.E. Mr. Muhammad Lutfi, Chairman of the Japan Indonesia Bilateral Committee of the Indonesian Chamber of Commerce and Industry (KADIN) and Former Ambassador of Indonesia to Japan, H.E. Mr. Masafumi Ishii, Ambassador of Japan to the Republic of Indonesia, Prof. Hidetoshi Nishimura, President of Economic Research Institute for ASEAN and East Asia (ERIA), and Mr. Christophe Bahuet, Country Director of United Nations Development Programme (UNDP)	

RECEPTION FOR PROJECT 2045 AND ERIA 10TH-YEAR ANNIVERSARY

19:00–19:05	National Anthems
19:05–19:10	Opening Remarks by H.E. Mr. Masafumi Ishii, Ambassador of Japan to the Republic of Indonesia
19:10–19:15	Opening Remarks by Prof. Hidetoshi Nishimura, President of Economic Research Institute for ASEAN and East Asia (ERIA)
19:15–19:25	Projection of Project 2045 Video and ERIA 10th Anniversary Video
19:25–19:30	Remarks by Mr. Teru Fukui, Secretary General, Headquarters for Promoting the Establishment of a Disaster Resilient Japan, Member of the House of Representatives
19:30–19:35	Ceremony for submission of Report of Project 2045/Photo session
19:35–19:40	Remarks by H.E. Drs. H.M. Muhammad Jusuf Kalla, Vice President of the Republic of Indonesia
19:40–20:30	Reception

Sunday, 9 December 2018

SYMPOSIUMS AND CLOSING

09:00–09:05 Opening Remarks by H.E. Dr. Ir. M. Basoeki Hadimoeljono, Minister of Public Works and Housing

09:05–10:35 Symposium 1: To uphold democracy and become maritime global powers

Keynote Speech by Prof. Hikmahanto Juwana, Professor of University of Indonesia (TBC)

Moderator : Dr. Phillips J. Vermonte, Executive Director of Center for Strategic and International Studies (CSIS)

Panelists : Dr. Nobuhiro Aizawa, Associate Professor of Kyushu University, Ir. H. Heri Akhmadi, Head of Research and Development Agency of the Indonesian Democratic Party of Struggle (PDIP), Prof. Dr. Jamhari Makruf, Board of Advisory, Syarif Hidayatullah State Islamic University Jakarta, Dr. Bachtiar Alam, Director of Research and Community Service, University of Indonesia, H.E. Mr. Masafumi Ishii, Ambassador of Japan to the Republic of Indonesia, and Prof. Hikmahanto Juwana, Professor of University of Indonesia

10:45–12:15 Symposium 2: To be top 5 GDP

Keynote Speech by H.E. Mr. Airlangga Hartarto, Minister of Industry of the Republic of Indonesia

Moderator : H.E. Mr. Muhammad Lutfi, Chairman of the Japan Indonesia Bilateral Committee of the Indonesian Chamber of Commerce and Industry (KADIN) and Former Ambassador of Indonesia to Japan

Panelists : Dr. Muhammad Chatib Basri, Co-founder and Managing Partner of Creco Research Institute, Prof. Ir. Jusman Syafii Jamal, President Commissioner of Indonesian Railways Company (PT. KAI), Prof. Ari Kuncoro, Dean of Faculty of Economics and Business, University of Indonesia, Dr. Tri Mardjoko, Dean of Economic Faculty, Dharma Persada University, Mr. Keishi Suzuki, President Director of JETRO Jakarta Office

12:15–13:15	Lunch break
13:15–14:45	Symposium 3: To Achieve High Quality of Life beyond the SDGs 2030 Keynote Speech by H.E. Mr. Rudiantara, Minister of Communication and Information of the Republic of Indonesia Keynote Speech by H.E. Mr. Tsukasa Akimoto, State Minister of the Environment of Japan Moderator : Dr. Koki Hirota, Professor of Saitama University Panelist : Prof. Dr. Mari Elka Pangestu, Board of Trustees of Center for Strategic and International Studies (CSIS), Prof. Arief Anshory Yusuf, President of Indonesian Regional Science Association (IRSA), Dr. Titik Anas, Founder of Presisi Indonesia, Mr. Ryo Ogawa, Senior Representative of Japan International Cooperation Agency (JICA), and Dr. Maxensius Tri Sambodo, Senior Researcher of LIPI
14:45–15:00	Closing Remarks by Prof. Hidetoshi Nishimura, President of Economic Research Institute for ASEAN and East Asia (ERIA)

DAY 1 – OPENING SESSION

The opening session started with remarks from UNDP Country Director Mr. Christophe Bahuet. Mr. Bahuet recognised that: (1) both Japan and Indonesia have gone through ups and downs like all countries in the world; and (2) there are a lot of uncertainties regarding 2045, resulting in Project 2045's objective of creating a life of plenty, freedom, and safety in a society that is peaceful, stable, democratic, diverse, and tolerant. This objective resonates with the ideals of the UN and the objectives of the SDGs. With an emphasis on readiness, Project 2045 analyses current trends to anticipate the future as much as possible. Mr. Bahuet affirmed that Indonesia and Japan can cultivate the richness of exchanges for development, for example, in the digital economy, disaster management, and disaster preparedness, as well as preventing violent extremism. The role of Indonesia and Japan in enhancing democracy and development is very valuable and meaningful; thus, both countries can count on UNDP to promote Project 2045 and to implement its recommendations.

The honourable guest Mr. Teru Fukui delivered the next opening remarks on behalf of Mr. Toshihiro Nikai, Secretary General of the Liberal Democratic Party of Japan. In his remarks, Mr. Fukui mentioned that Project 2045 was established based on the historical relation and cooperation between Japan and Indonesia. The purpose of the project is to prepare a comprehensive recommendation on areas of cooperation for Japan and Indonesia so that both countries can be world leaders by 2045. To achieve this, both countries acknowledge the important role of younger generations in realising this shared dream.

Prof. Dr. Ir. Ginandjar Kartasasmita, who held several ministerial positions during the Soeharto era, also delivered opening remarks during this session. His speech conveyed his views on how Indonesia-Japan cooperation has evolved and how both countries see the future. He divided the timeline into the 'old-time' post-war relationship prior to Indonesia and Japan starting their diplomatic relations in 1958, followed by the current situation and the potential future relationship. He recalled Fukuda's doctrine, which nurtured a positive attitude in the region (Southeast Asia) toward Japanese economic cooperation, encompassing official development assistance (ODA), foreign direct investment, and trade, as well as toward the presence of Japanese products in Indonesian markets. Today, Japan is still Indonesia's top foreign investor and contributes significantly to local social and human resources development, and has become the most important external source of development for Indonesia through its provision of economic assistance, loans, and scholarships and internships. Looking at the future, especially with rising China and development in the Republic of Korea (henceforth, Korea), Japan and Indonesia can benefit from their mutual relationship as they share common traits as

maritime democracies. However, they have an obvious difference: while Indonesia is an emerging nation with a young population, Japan is an advanced nation with an ageing population.

Mr. Kartasasmita described briefly the four pillars of Indonesia's vision: (1) human development and science/technology advancement; (2) sustainable economic development; (3) equitable regional development that includes poverty eradication; and (4) strengthening national security and governance as indicated by the quality of democracy, reforming bureaucracy and eradication of corruption. He emphasised Japan's vision of 'Society 5.0' and its development of artificial intelligence to create innovative products and services in the future. Such technologies are regarded as solutions for Japan's major 21st-century challenges, including its ageing society. Migrant workers, new technologies, and women's workforce participation are expected to offset the decrease in Japan's labour supply. However, Mr. Kartasasmita also mentioned that, due to the blurred lines between economic interests in the Indo-Pacific regions, Japan should forge economic ties with Indonesia and other ASEAN countries, as well as simultaneously create a strategic partnership for active participation in the Indo-Pacific strategy.

The next opening speech was delivered by the Minister of National Development Planning (BAPPENAS), H.E. Mr. Bambang Brodjonegoro. Since BAPPENAS oversees the creation of Vision Indonesia 2045, the remarks from Minister Bambang were one of the most awaited and significant of the day. In his in-depth presentation, Minister Bambang clearly mentioned that the launching of Project 2045 will mark a milestone for the mutual relationship between Indonesia and Japan. Indonesia and Japan have cooperated closely not only at the government level, but also at the business-to-business and person-to-person level. In fact, cooperation with Japan

has boosted Indonesia's economic development in food security, transportation and connectivity, human resources development, financial institution, disaster mitigation, and strengthening of its democracy and bureaucracy. With a total funding of more than US$49 billion in the form of project loans, grants, and technical assistance, Japan has become the most important development partner for Indonesia.

The relationship between Japan and Indonesia was further strengthened through the joint statement by President Joko Widodo and PM Abe on 23 March 2015 that was followed up by a meeting in Bogor in January 2017. While the two leaders have agreed on some concrete deliverables, some of the cooperation will be realised through economic development channels, such as the extension of MRT Jakarta and the development of Patimban Port.

The relationship between Japan and Indonesia was further strengthened through the joint statement by President Joko Widodo and PM Abe on 23 March 2015 that was followed up by a meeting in Bogor in January 2017. While the two leaders have agreed on some concrete deliverables, some of the cooperation will be realised through economic development channels, such as the extension of MRT Jakarta and the development of Patimban Port.

Minister Bambang did mention that BAPPENAS has been working closely with the Japanese embassy, the Japan International Cooperation Agency (JICA), and other related parties to immediately implement this agreement and devise strategies for further cooperation. Indonesia now has taken some initiatives to accelerate infrastructure provision by developing investment schemes such as Public-Private Partnerships and Non-State Budget Infrastructure Financing. Indonesia's State-Owned Enterprise (SOE) and the private sector are encouraged to stand as the main actor for public infrastructure in Indonesia. JICA's willingness to support this policy, for instance, by providing ODA funding facilities for the SOE to finance a toll road project in Sumatra, is appreciated by the Government of Indonesia. Minister Bambang hoped that the Japanese Government and private sector could continue to expand their support through this investment scheme in line with PM Abe's initiative to realise quality infrastructure in Indonesia. Indonesia is aiming to avoid the middle-income trap and be a sovereign, progressive, just, and prosperous nation; thus, BAPPENAS has prepared its Vision Indonesia 2045 to set its

future path. Under optimistic and baseline scenarios of an average of 5.7% and 5.1% economic growth, respectively, until 2045, Indonesia is expected to have the 5th–7th largest economy in the world within 18–20 years.

To achieve its four pillars of development, Indonesia has transformed itself to advance its economy. Hence, its performance is determined by the ability of its human resources to make the most of its natural resources. Minister Bambang said that Indonesia will shift its policy from providing basic education to strengthening tertiary and vocational education. Indonesia should prepare a critical mass of labour skilled in science and technology and able to adapt to various future professions. Because Indonesia will experience a high demographic bonus from 2022 until 2030, having a critical mass of skilled human capital will become the key to accelerating its economic development and realising Vision Indonesia 2045. The demographic bonus is estimated to last until 2045, emphasising the need to anticipate urbanisation problems and to utilise the productivity from agglomeration to drive the economy. Similarly, technology that is changing rapidly should be incorporated and the possible disruption cost should be minimised. Minister Bambang described the four types of technology that are expected to develop in the future: (1) digital technology; (2) technology that reduces physical and distance limitations; (3) energy technology; and (4) health technology. The role of science and technology is enhanced by three efforts: (1) increasing R&D spending from 1.5% to 2% of GDP in 2045; (2) endeavouring to become a global centre of science and technology, especially in maritime science, as well as a centre for biodiversity, material technology, digital technology, and for disaster studies; and (3) increasing and institutionalising cooperation between government, universities, and industries.

Indonesia has a vision of becoming one of the world's largest economies driven by investment in trade, industry, tourism, maritime and services, as well as supported by reliable infrastructure and a strong resilience on food, water, and energy. To ensure that Indonesia's economic goal is in line with environmental commitments, it is adopting low-carbon development principles in implementing its economic policy. To drive economic growth, industry is focusing on natural resources processing based on cluster and industrial zones, with an integrated upstream-downstream supply and value chain. Industrialisation in Indonesia will make it an important player in the global value chain. Industrial priorities

are comestibles, textiles and apparel, automotives, electronics, and chemicals and pharmaceuticals. Changes for 'Industrial Revolution 4.0' are adjusted according to the characteristics of each industry. The GDP share of industrial sectors or manufacturing is expected to increase to 26% by 2045; currently, it is less than 20%.

In addition, development is encouraged to make Indonesia one of the world's leading tourism destinations. The flow of foreign tourists enjoying Indonesia's natural landscapes and cultural diversity is expected to increase to more than 70 million/year by 2045. With a goal of becoming the world's maritime axis, Indonesia will accelerate its maritime economy, strengthen its maritime power, and improve its maritime culture. The contribution of the maritime economy to GDP increased to 6.4% in 2015 and is expected to increase to 12.5% in 2045. Indonesia continues to implement open and fair-trade policies. Indonesia currently ranks only 29th in global exports, producing 0.9% of the 2015 total, though that is expected to increase to around 2% in 2045, with the world ranking rising to 10th. Moreover, Indonesia's commitment to the environment continues to be maintained through reducing emissions by 41% from the baseline scenario. The environmental quality index is expected to increase to above 80%. Indonesia's unique wealth in biodiversity will continue to be maintained, strengthening its status as a capital of sustainable development.

Minister Bambang added that one of the significant challenges in Indonesia is to provide equal opportunities and services to all citizens and to ensure equitable development across the archipelago. Indonesia has strategies to have more equitable development that expands income equality, reduces regional disparities, provides public infrastructure, and eradicates extreme poverty. To lessen disparities, the eastern regions of Indonesia, namely Kalimantan, Sulawesi, Bali, Nusa Tenggara, Maluku, and Papua, are encouraged to grow more than the western regions of Java and Sumatra. The share of eastern Indonesia in the national economy is estimated to increase from only 20% in 2015 to 25% in 2045. Java is slated to become the basis of trade and services, Sumatra the new industrial gateway to Asia, Kalimantan the national processing industry and energy barn, and Sulawesi the basis of the food industry and the gateway to eastern Indonesia. Bali, Nusa Tenggara, and Maluku are intended to become the basis of international tourism and the national fishery, with Papua as the national food basis and natural resources-based economic sector.

Meanwhile, infrastructure will increase inter- and intra-island connectivity, induce balanced development among regions and urban and rural areas, provide access to basic services, and anticipate climate change. As the global economy and geopolitical centre shifts from the west to the east, Indonesia and Japan should take advantage of their strategic location in the central Indo-Pacific region. Since the global economy will become more interdependent, having Japan as one of its closest partners is precious for Indonesia, as has already been proved over the 60-year history of the friendship. Lastly, Minister Bambang underlined some important issues for Indonesia-Japan cooperation in the future: (1) As countries with an archipelagic setting, Indonesia and Japan will rely on their maritime economies. The ocean in the future will not only become the means for connectivity and trade, but also will become the main source of food and energy; (2) As the economic centre moves to Asia, Indonesia-Japan cooperation in maritime security will also be important for bilateral as well as international trade. On the other hand, sharing a similar geographic condition, Indonesia and Japan are also prone to natural disasters and climate change; (3) Indonesia has no choice but to strengthen its capacity in disaster management since this has become the new normal, with earthquakes, volcano eruptions, landslides, forest fires, floods and many others becoming more frequent. Support from Japan will improve disaster resilience, emergency response, and post-disaster recovery and reconstruction; (4) Advancements in technology and innovation will also become the main feature of Indonesia-Japan cooperation. Indonesia's policy to improve human resources and transform to an industrialised country should be in line with its strategy to increase capacity in innovation and technology and Japan is the best partner to help achieve this objective; and (5) As part of the global community, Indonesia has an obligation to maintain global stability and peace. Minister Bambang closed his speech with the hope that Indonesia and Japan can continue to work together and reach out to other countries and regions to have a peaceful and prosperous world that is ready to address future challenges.

The opening session was closed by a photo session that included all VIP guests and some prominent Executive Committee members.

Panel Discussion 1: Projection of Indonesia and Japan in 2045

This panel discussion featured key people for Project 2045, with a primary focus on the long-term partnership and collaboration, along with a shared vision and mission for Japan and Indonesia, as well as enhancing their role as global players in the Indo-Pacific region and in the world.

The session continued to the first panel discussion with the topic 'Projection of Indonesia and Japan in 2045 and Agenda Setting'. Dr. Takashi Shiraishi, Chancellor of the Prefectural University of Kumamoto, moderated this discussion. In his introductory notes, Dr. Shiraishi mentioned that this is the time for Japan and Indonesia to create a new relationship foundation for the coming 30–50 years. Collaboration between Indonesia and Japan would allow them to do many things regionally, as well as globally. Other countries, especially in the Indo-Pacific region, will expect Japan and Indonesia to do more than they currently do. Thus, the partnership will be quite crucial in the coming years. The first point of the partnership, then, pertains not only to the two countries, but also to the entire region, as well as the world. Second, regional geopolitics and geoeconomics are changing fast and post-cold war globalisation affects the world. As a result, many people are asking what kind of deal and social contract is suitable between governments and people in the 21st century. The life of plenty, freedom, and safety that is sought is not just freedom along the American model or safety along the Chinese model, but rather that people can enjoy economic prosperity, democracy, freedom, and safety (from crimes, illness, hardship, retirement, and so on). In other words, people can have a very good quality of life. Third, human resources development is the key to achieve this quality of life. As a result, the most important thing to do is train people, so when new tasks and jobs are available, people are already being trained for them.

Dr. Shiraishi underlined the importance of infrastructure. He applauded President Joko Widodo, who has been very active on infrastructure development in the last (almost) 5 years. The population living in the Jakarta Bandung area will reach 76,000,000 by 2045. This is a huge number, more than twice the current Tokyo metropolitan area. This means Indonesia has an excellent opportunity to create smart cities and infrastructure. In his conclusion, Dr. Shiraishi mentioned that Indonesia and Japan can work together not only in business and infrastructure, but also in science, technology, security, and other areas. Technology has enormous power to improve life, but to make it happen, Japan and Indonesia need to develop globally competitive research institutions and universities.

H.E. Mr. Masafumi Ishii, Japan's Ambassador to the Republic of Indonesia, also mentioned how important it was for the seminar not to look back and offer congratulations, but also to make sure that this spirit can be passed on to the next generation. Project 2045 shows that Japan will need Indonesia more in the future, and vice versa. In Indonesia, Japan has been consistently treated as the most trusted country. There are three common targets for Japan and Indonesia's partnership: to become moderate democratic global powers, to become top 5 GDP, and to achieve a high quality of life beyond the SDGs by 2030. Indonesia is already the leader in Southeast Asia and it should play in a bigger, more global, arena.

The presentation was then continued by the second panelist, Mr. Bambang Prijambodo, expert staff of BAPPENAS. He addressed the content of Vision Indonesia 2045, which consists of four development pillars, as mentioned above. He showed how Indonesia will move from the 16th to the 5th ranking in GDP income by 2045 and will join the high-income countries by 2038 with 5.7% economic growth. He also added the statistic that Indonesia's population will reach almost 319 million by 2045. Mr. Bambang stated that urbanisation is very

important in the future, and that the Government of Indonesia consistently improves the quality of education, science, and technology. Indonesia has tried to ensure the investment climate will reach the 10th-best by 2045 and manufacturing will accelerate from 20% to 26% by 2045. He also mentioned improving the human capital of farming research, technology, and institutions to ensure food security. Finally, Indonesia is committed to reducing the poverty rate to close to 0% by 2040 and increasing regional development by 5% by 2045.

The next presentation, delivered by Prof. Ken Jimbo, addressed the outlook of the region and the international community in 2045. 2045 is not coming in one shot, but as a moving target; hence the format for stability is not economic prosperity 2030 for 2045 or vice versa, but rather that Japan and Indonesia must be constantly accommodating any necessary strategy. Prof. Jimbo explained that the days of Japan and the US sharing 40% of the world's GDP are now over.

In 2005, Japan and China had the same amount of defence spending, yet, in 2018, China's spending rate was four times that of Japan; moreover, it will likely increase to seven times Japan's spending rate by 2035. Prof. Jimbo mentioned that there should be a systemic shift on how Japan's strategic posture should be defined. Because not only China but also other countries with emerging economies will do the same, Japan must maintain its diverse diplomatic portfolio, with Indonesia retaining its status as an important counterpart in dealing with this situation. Japan must be able move forward by considering how to retain peace and stability in the Indo-Pacific region together with the US, China, Australia, and India. Indonesia and Japan aim to strengthen the global economic regime through free trade, and, regionally, through participating in the Trans-Pacific Partnership and Regional Comprehensive Economic Partnerships. Prof. Jimbo, while also highlighting the improvement of governance worldwide, noted how a report

from The Freedom House, which researches democracy, unfortunately said that political freedom has been declining progressively over the last 12 years. Economic development and political pluralisation are threatened now as shown by surveys that detail the low performance of democratic governance, and the fact that authoritarian states' SOEs have managed to achieve high performance without political reform. In this sector, Japan and Indonesia need to align democracy with good performance of politics to maintain its vibrancy in 2045 and work together against any regression tendencies.

Prof. Hidetoshi Nishimura, President of ERIA, delivered his presentation afterwards. He concentrated on projected economic and technological growth as outlined in Project 2045, and noted that Indonesia's manufacturing export levels do not seem satisfactory in comparison with those of Malaysia, Thailand, and Viet Nam. It is imperative to consider how to boost exports of Indonesia, as happened in the 1980s, in light of the current circumstances. The first opportunity is e-commerce, which drastically increases value for manufacturing exports. Since present consumers are comfortable purchasing through the internet, the export strategy needs to integrate suppliers with consumers. The second opportunity is 'Industrial Revolution 4.0', which is expected to reform the existing industries. The original 'Industry 4.0' needed to be upgraded using the most advanced technologies and well-trained skilled workers. Prof. Nishimura noted that Indonesia is a young population, while other countries are facing ageing societies; hence, it needs a strategy for developing human resources. To achieve the maximum advantage of its young population, Indonesia must develop information communication technology (ICT) education from elementary school. Prof. Nishimura affirmed that education technology (edutech) based on ICT is promising because it can be used not only for intellectual simulation, but also for engineering and computer programming classes for workers. Furthermore, considering the Japanese experience of "Kosen" (vocational technical college), Japan and Indonesia can cooperate to devise an industrial education curriculum, which is needed to manufacture exports with high global competitiveness. As a result, Indonesian young people who receive this education will

also help Japanese overseas SMEs, which have been suffering from a shortage of successors due to ageing populations.

At the end of the panel discussion, Dr. Shiraishi offered some conclusions:

• Japan and Indonesia have been partners for the last 70 years, and now both countries need a partnership platform;

• The partnership in the past was mainly for Japan to gain a position in Asia and for Indonesia to achieve economic development, political stability, and democracy;

• In the coming years, the partnership is not just between the two countries, but also beyond the region;

• Millennials are the major economic, political, and technological force; and

• Because technology is advancing so fast, with artificial intelligence rapidly becoming part of life, people should also be trained to be the engine of economic prosperity.

Panel Discussion 2: Cooperation between Indonesia and Japan for 2045

Discussing the Executive Summary of Project 2045, this panel covered the future of Indonesia and Japan in trade, industry, and the economy, and specifically addressed the biggest challenges in human development and issues on disaster management.

The second panel discussion was led by H.E. Mr. Muhammad Lutfi, the former Ambassador of the Republic of Indonesia to Japan. He introduced the Executive Summary of Project 2045 in his opening section and described the major challenges that will be faced in 2045: (1) The global population will be around 9.5 billion people, with about 66% living in cities, a 95% increase over the current situation; (2) international trade will increase 3.4% annually; (3) global temperatures will increase about 3%–3.5%; and (4) China's role will increase and the Middle East will be (more) vulnerable.

Mr. Lutfi mentioned that there are three scenarios that Indonesia can enact in terms of economic development: (1) If the trajectory of Indonesian growth remains at 5.1% (the 'do nothing' scenario), its economy will be the 7th- or 8th-largest in the world by 2045, with income per capita around US$18,000; (2) If it 'does its homework', Indonesia will have the 7th-largest economy in the world by 2045, with income per capita around US$23,000, and the middle-income trap circumvented by 2036; and (3) If it grows at the rate of 6.4%, Indonesia will become the 4th-largest economy in the world and its GDP per capita will be around US$28,000. Mr. Lutfi concluded these three scenarios by stating that Indonesia will grow old without growing prosperous if growth is less than 6.4%.

To avoid the middle-income trap, he added, Indonesia must invest in infrastructure and do technology transfer. To achieve this in 18 years, GDP per capita must grow from US$4,000 to US$12,000. Currently, 20% of Indonesia's GDP comes from manufacturing, the highest

level in the world after India, the US, and Korea. To grow 6.4%, Indonesia needs to create more employment and reform the investment climate. The foremost achievement of Indonesia today is revealed by comparing its Ease of Doing Business ranking from 2005, when it was 154th, to today's ranking, which President Jokowi has managed to bring to 73rd.

The discussion then moved to a presentation by Mr. Edi Yusup, the Director of East Asia & Pacific from the Ministry of Foreign Affairs. Mr. Yusup stated clearly that Indonesia always considers Japan as a strategic and reliable partner, and they have enjoyed a solid and exceptional bilateral relationship. Currently, Japan has become the second-largest investor in Indonesia and also one of its main trading partners, and both countries have cooperated on various infrastructure projects, including the ongoing mass rapid transit project.

The key challenge now is how to ensure Indonesia and Japan enhance their cooperation as trusted partners. Project 2045 is expected to establish a clear roadmap and timeline. Japan is expected to become more aggressive in terms of trade and investment. Currently, China is more aggressive than Japan; should Japan fail to match this, China will overtake it as the largest global investor. In addition to enhancing bilateral cooperation, both countries can also work together to find a third market. Since Indonesia is currently negotiating free trade agreements with 12 countries, Japan can leverage this opportunity to coordinate with Indonesia on a product, whether it be agricultural or industrial, to be exported to a third country. Mr. Yusup recommended that Indonesia and Japan enhance cooperation, not only in the maritime sector, but also in security. He also added that both countries should work together to develop the outer islands of Indonesia to provide better security in the future.

The next presentation was delivered by Prof. Koki Hirota, an Executive Committee Member of Project 2045 who is also a Professor at Saitama University Japan. He highlighted three subjects during his presentation: (1) regional development; (2) natural disasters; and (3) international development cooperation. He focused on the impact of natural disasters on development in Indonesia, noting that its current expenditure for natural disaster prevention is only 0.03%–0.07% of GDP.

This figure is much lower than China's expenditure level of 0.15%–0.37% of its GDP, or the Philippines' expenditure level of 0.1%–0.7% of its GDP. It shows that the higher the income level, the greater the attention of the government toward natural disaster prevention. Japan, on the other hand, has the most advanced technology in seismic building/construction. So, Japan can transfer technology to Indonesia and share its experiences. There is a great potential for future cooperation in natural disaster prevention, not only in information sharing, but also in co-creation.

Prof. Hirota also mentioned that agriculture and fisheries will be more important by 2045; therefore, it is important for Japan and Indonesia to innovate together to increase their productivity. There are many possibilities such as using big data censoring and block-chain technology for agriculture. Regarding international development cooperation, Prof. Hirota said that the focus of Indonesia of being the fourth-largest global economy means it is also expected to make international contributions. It is not too early for Indonesia to start offering ODA because at the time Japan established aid agencies such as JICA, its income per capita on the purchasing power parity basis was much lower than Indonesia's today.

Responding to Mr. Lutfi's question about the trend of ODA reduction by the US and others, Prof. Hirota said that though many economists support protectionism, we must remember that our life is the product of globalisation, which enables buying cheaper products. He believed that protectionism is an obstacle for people's welfare.

The discussion continued with a presentation from Mr. Hirofumi Takeda, President of the Jakarta Japan Club (JJC). JJC is the Japanese Chamber of Commerce and Industry in Indonesia, with 700 company members. According to JJC research, 20% of Indonesia's exports and 10% of its GDP comes from Japanese companies; 5 million people, or 8% of local workers, work for Japanese companies in Indonesia. Mr. Takeda stated that 70% of JJC members belong to manufacturing industries, which produce high value-added products. That area is known as the highest-paying in Indonesia. In the private sector, productivity is essential for being competitive. To achieve that, human resource development is important for JJC members. Japan believes that Indonesia needs to train its workers to produce quality products. That is why Toyota, Panasonic, Epson, and Honda have their own vocational training systems. Mr. Takeda believes that if Indonesia can replicate this approach by working together with the Japanese private sector, the government, with a broad human resources development framework, can successfully improve workers' skills. Prof. Takeda noted that they are planning to introduce skill certification programmes into Indonesia, and that salary systems can be linked to these programmes as an incentive for workers. Due to its ageing population, the Japanese labour force is shrinking. So, countries like Japan need skilled workers from a country rich in human resources, such as Indonesia. A framework for this cooperation will cultivate a win-win relationship for the two countries.

The panel discussion ended two hours before the reception and continued with a press conference that was attended by Dr. Shiraishi, Prof. Nishimura, Mr. Bahuet, and Ambassador Ishii in a separate private venue.

DAY 1 – RECEPTION

This reception featured the most honourable guest, H.E. Drs. H. M. Jusuf Kalla. As per regular procedure, the event was officially started by the playing of Indonesia's national anthem, Indonesia Raya, and Japan's national anthem, Kimigayo.

Before Vice President Kalla was invited to be on stage, the session was opened by the Ambassador of Japan to Republic of Indonesia, H.E. Mr. Masafumi Ishii. He began his remarks by elucidating the meaning of the Indonesia-Japan partnership in Project 2045 and the need for greater interdependence.The partnership will extend beyond a bilateral relationship; rather, it will be needed for the stability and prosperity of the world as a whole. As such, efforts are required to attain the bright future envisioned for Japan and Indonesia. It is also the responsibility of the younger millennial generation to receive Indonesia's good traditions and also to implement them since Indonesia's spirit over the past 60 years is to work and progress together. Mr. Ishii did hope that the millennial generation will be able to answer this call.

Another important remark was delivered by Prof. Nishimura, President of ERIA. As this reception was to commemorate not only the 60th anniversary of the Indonesia-Japan bilateral relationship, but also the 10-year anniversary of ERIA, Prof. Nishimura spoke straight to the point, noting that a blueprint for consolidating future cooperation entitled 'For Joint Partnership towards Our Common Future, A Joint Project of Two Maritime Democracies' had been successfully published that day. The report mainly discussed how Indonesia and Japan can cooperate to 'uphold democracy and become maritime global powers', 'to be top 5 GDP', and 'to achieve quality of life beyond the Sustainable Development Goals 2030'.

Prof. Nishimura also briefly explained ERIA's initial assignments, which were to develop ASEAN connectivity, strengthen ASEAN's resilience, and conduct economic research and deliver policy recommendations for coping with the 5-year acceleration of the completion of the ASEAN Community in 2015. Since its inception, ERIA has conducted various studies and expanded its research coverage. To strengthen its policy support capacity, ERIA established a Policy Design Department in 2016. To play the role of 'Organisation for Economic Co-operation and Development in East Asia', ERIA developed various policy recommendations. ERIA is determined to support the region to overcome challenges in ASEAN and East Asia and accepts the role of leader in conducting high-quality research and making policy recommendations to tackle challenges such as the ageing society, the information communication society, energy security, the environment, and developing human resources.

The reception then continued with the Project 2045 video, as well as the video of ERIA's 10th anniversary. After that, the MC invited Ambassador Ishii, Mr. Teru Fukui, Prof. Nishimura, Dr. Shiraishi, Ambassador Lutfi, Prof. Ginandjar Kartasasmita, Mr. Christophe Bahuet, and Vice President Kalla to come on stage for the ceremony of the submission of the policy paper. Afterwards, it was time for Vice President Kalla to deliver his remarks.

Vice President Kalla congratulated UNDP and ERIA and all contributors in preparing the policy paper. Mr. Vice President offered his sincere gratitude for the hard work and intellectual contribution to discuss the future cooperation and development of Indonesia and Japan in order to become more prosperous and peaceful nations.

Indonesia has always been aware of its potentials: the third-largest democracy, one of the biggest maritime economies, the biggest moderate Moslem country, the largest archipelago strategically located between the Indian Ocean and the Pacific Ocean, 40% of ASEAN in terms of population and economic size, a demographic dividend with approximately 35% millennials, a member of G20, and active participation in regional and global activities. These potentials should be capitalised to achieve the goal of becoming an economic and maritime power by 2045. Having been initiated in 2018, Project 2045 is a testament to Indonesia's preparing for its future as early as possible. As President Joko Widodo said, 'to achieve the goal of becoming high-income country in 2045, we should move now.'

Vice President Kalla touched upon the ongoing review of the Indonesia-Japan Economic Partnership Agreement. He thinks that the review has been long overdue, so we need to improve and modernise the agreement in order to face the new world trade dynamic. In this regard, Japan could contribute to achieving that target. Vice President Kalla affirmed that Indonesia and Japan together can play an important role for peace, stability, and economic development of the region and the world. He said that both countries are also aware of the challenges that could hinder this goal and how they must find ways to overcome them. In addition, 2045 will also be completely different; therefore, there should be periodic review for necessary adjustment. The cooperation to achieve Project 2045 should be based on mutual benefits, a sincere relationship, and respect for each other's national development goals. He expressed his hope that, through Project 2045, the good and friendly relationship of Indonesia and Japan can be enhanced and bring mutual benefit for the people in both countries.

DAY 2

SYMPOSIUM 1 – To uphold democracy and become maritime global powers

This session highlighted the importance of the rule of law in democratic countries, political security in the region as well as political stability and, more importantly, how to tackle the most recent issues in the decay of religious tolerance.

The symposium on Day 2 was divided into three parts with different security, economic, and social agendas: first was the discussion with the agenda 'To uphold democracy and become the maritime global powers'.

Prof. Hikmahanto Juwana delivered his keynote speech before the discussion began. He mentioned that the rule of law is very important in Indonesia and many other countries, including Japan. Though the rule of law is enshrined in Indonesia's constitution, it has nonetheless not been practiced properly, and a classic problem in Indonesia is how to uphold the law without any intervention of power and money. In addition, the issue of maritime security is considered paramount when it comes to the common interest between Indonesia and Japan. Indonesia has vast maritime access that is recognised by the international community; however, there is a question of whether Indonesia has the budget and manpower to ensure maritime safety and security, and whether it is going to work with other countries to ensure its sovereignty

Dr. Phillips J. Vermonte, the senior researcher of the Center for Strategic and International Studies, who, along with Prof. Hikmahanto, contributed the content of Challenge 1&2 (maritime security, rule of law and democracy) in the Executive Summary, led the discussion as moderator. The first panelist featured during this session was Dr. Nobuhiro Aizawa. Dr. Aizawa is the main author of Challenge 1&2 and an Associate Professor at Kyushu University. Dr. Aizawa said that Japan and Indonesia need to work together because both countries share a common dream of the future in 2045. Maritime policy is a key dual strategic position, but it has a lot of challenges.

Meanwhile, the second panelist, Ir. H. Heri Akhmadi, Head of the Research and Development Agency of the Indonesian Democratic Party of Struggle (PDIP) raised some issues about democracy. He stated that the two biggest issues in Indonesia are democratic consolidation and political stability. Mr. Akhmadi said that both Japan and Indonesia have quite different internal democratic situations; Japan has the Liberal Democratic Party as the majority, while Indonesia is multi-party, with no party representing more than 20% of voters. From 1999 to 2014, parties in Indonesia were divided into three groups: nationalist, development, and Islamic. The Indonesian government's formation will depend on pragmatic coalitions. Mr. Akhmadi affirmed that the Indonesian political landscape will still be characterised by oligarchies, cartels, and dynastic politics in the next decade, and regime sustainability will depend on the delicate balance of strong and stable political supports with smart and sound development policies. To sum up, Indonesia needs to formulate a sustainable, balanced democracy in order to achieve its ultimate goal of being a prosperous country.

Prof. Dr. Jamhari Makruf, Board of Advisory of the State Islamic University Jakarta (UIN; Syarif Hidayatullah), explained that Indonesia has the largest Moslem population in the world; thus, it cannot be denied that Islam is an integral part of its development. Dr. Makruf stated that Islam is compatible with democracy in Indonesia, and democratic consolidation in Indonesia has strong support from Moslems. Indonesian Moslems celebrate difference and diversity by developing tolerant or moderate Islam, and UIN is supporting this.

After the presentation from Prof. Makruf, Dr. Bachtiar Alam, senior lecturer in the Faculty of Humanities, University of Indonesia, raised the topic of democracy and its relation to hate speech. Democracy is not free; rather, it must be fought for and requires free speech. But hate speech as a discriminatory expression that attacks individuals or groups based on religion, race, etc. should not be entitled to protection under the principle of free speech. Dr. Alam said that Japan and Indonesia, in their own different ways, have tried to stop the rising tiger of hate speech. In May 2016, Japan passed an anti-hate speech law. The law provides no penalty for hate speech, but defines the responsibility of states and municipalities to combat it. The law was criticised, but it was a significant step. Indonesia now is facing increasing hate speech, especially pertaining to next year's presidential election, and might consider preparing its own anti-hate speech policies. As Dr. Vermonte added, Indonesia has been shaped by dual nationalist and Islamic streams as part of its political DNA; how to keep this diversity intact is now its homework.

Ambassador Ishii, in his capacity to comment on the panelists' presentations, pointed out that Indonesia has a responsibility for spreading moderate Islam not only internally, but also throughout the world. There are many types of democracy, but they need the rule of law; therefore, they need the shape of the rule and the process to make new rules. The rule of law is important, but not the rule by law. There are three parameters of democracy, which are prosperity, freedom, and security, but the degree of freedom is the most important for democracy. Prof. Hikmahanto added his comments about democracy, stating that democracy needs political parties, but the Indonesian people are starting to lose confidence in them because of money corruption.

As such, political parties need to be aware of these circumstances; if not, they will lose the trust of the public and there will be no democracy. Indonesia must learn from Japan in terms of being efficient and developing workable democratic mechanisms. Indonesia can learn from Japan without trying to become it.

In the second part of the morning symposium, the panelists addressed the Free and Open Indo-Pacific (FOIP) and the expected cooperation between the two countries. Japan is currently trying to make a free and open Indo-Pacific strategy aiming to connect the existing seas in the world; to do so, Japan must ensure the seas remain free and open, and increase the transparency of the international rules pertaining to them. There are three pillars in the FOIP strategy: (1) promote rule of law on freedom and safety navigation; (2) pursue economic prosperity by increasing connectivity; and (3) promote peace and stability by capacity building for law enforcement in Asian seas and countries. FOIP is a strategic concept without making a new institution since existing ones such as ASEAN could promote it. Promoting the rule of law also means increasing maritime awareness by sharing information on the movement of ships and traffic along the seas to prevent piracy, human trafficking, and narcotics smuggling. Increasing connectivity also means connecting the remote islands. The Government of Indonesia asked Japan to develop connectivity in Sabang, Natuna, Biak, Morotai, and many other remote islands.

Regarding this concept, Prof. Makruf had his own perspective, stating that Project 2045 must make sure that open maritime connections among Japan, Indonesia, and other countries should consider their impact on the local people. He also added that the cooperation of certain programmes should be balanced and can provide benefits for both countries. In response, Ambassador Ishii gave examples: Indonesia has asked the Government of Japan to develop Sabang Island, which is close to India, meaning there is a chance to create cooperation among Indonesia, India, and Japan. Japan also asked to develop Morotai and Talaud, which are close to the Philippines. There is the possibility of creating an Okinawa-Philippines-Morotai route, as opposed to going through Jakarta. To wrap up, Dr. Vermonte mentioned that many Indonesian interests coincide with FOIP. This concept even covers the region as far as Africa, with Japan, Indonesia, and several African nations having discussed potential mutual cooperation.

DAY 2

SYMPOSIUM 2 – To be top 5 GDP

Focused on economic issues, this session briefly explained how to make it possible for Indonesia to be top 5 GDP in 2045 by looking at projections from industrial manufacturing and SMEs, the demographic bonus and human capital, and how to maximise trade liberalisation and regional/international trade cooperation.

The next symposium addressed the economic session, where the agenda was 'To be top 5 GDP'.

The keynote speech, delivered by Mr. Airlangga Hartarto, Minister of Industry, addressed the vision of Indonesia in 2045 that are based on the four development pillars. By 2045, Indonesia aspires to become a sovereign, progressive, just, and prosperous nation, and to achieve US$13,162 GDP per capita. Currently, the GDP per capita is US$ 3,877. In 2036, Indonesia aims to have US$13,162 GDP per capita through the Making Indonesia 4.0 programme.

This target can be achieved if the average economic growth is 5.7%, wherein: (1) manufacturing growth is 6.3%, or contributes around 25% to GDP; (2) agricultural growth is 3%, or contributes around 7% to GDP; and (3) tourism attracts 73 million visitors to Indonesia. Manufacturing is expected to become the Indonesian economy's engine through increasing productivity, investment, and exports. Japan's annual investment is around US$5.4 billion, meaning more is needed from Japanese companies. Non-oil and gas industrial growth is around 5.01%; according to UNIDO, Indonesia ranks fifth in the world in terms of manufacturing value added, below China, Korea, Japan, and Germany. The Purchasing Managers' Index of Indonesia as surveyed by the Nikkei (January–

October 2018) is above 50%. This means that the market and real sectors have confidence in the Indonesian manufacturing sector.

Minister Hartarto also addressed the development under President Jokowi in the last 4–5 years. President Jokowi has developed new industrial estates (outside of Java) and created policies and plans such as: (1) new ports to increase connectivity between West and East regions; (2) Cilegon will be the basis of Indonesian industry, including petrochemicals and metals; (3) within 3–4 years, there will be 3 million tonnes of plastic upstream in Cilegon; (4) further, there will be 2 million tonnes of carbon steel in Cilegon; (5) in the next 3–4 years, the next expansion will be for PMAA, which is the raw material for acrylic (used to make TV screens); (5) there will be more investment in the tire industry following the recent development of synthetic rubber for tire making; and (6) the government will also make more polytechnics in Cilegon. In the next 15 years, Indonesia will get its demographic bonus. China, Singapore, Thailand, and Japan have enjoyed theirs earlier than Indonesia. This means that, until 2030, the productivity of the younger generation will become the source of economic strength for Indonesia. Therefore, the priority in 2019 for President Jokowi is human resource development.

To enhance human capital, the government will launch a 200% tax deduction for vocational training. This means if a company invests 1 billion, then the government will give it 2 billion, amortised over 5 years. The regulation is already on the desk of the Ministry of Finance. In addition, the Ministry of Industry, Chairman of PKPM, and the Ministry of Finance are authorised to extend tax holidays to industry deemed necessary for Indonesia's growth. With this policy, it will be possible to push GDP growth to 2%, increase job creation to more than 10 million by 2030, and increase manufacturing's GDP contribution to 25%. Currently, Indonesia has selected five sectors encompassing 60% of manufacturing and 65% of exports, as well as 60% of workers: (1) food and beverages; (2) textiles and apparel; (3) automotive; 4) electronics; and (5) chemicals.

This panel discussion was again led by H.E. Muhammad Lutfi. He recalled the scenarios developed by BAPPENAS on how Indonesia will achieve the status of top 5 GDP:

- Do nothing scenario with 5.1% growth, escape middle-income trap in 2038, GDP/capita US$19,000.
- Second scenario with 5.7% growth, escape middle-income trap in 2036, GDP/Capita US$23,000.
- Ideal scenario with 6.4% growth, escape middle-income trap in 2034, GDP/capita US$28,000.

He then invited Dr. Muhammad Chatib Basri, former Minister of Finance and Co-founder and Managing Partner of Creco Research Institute, to deliver his presentation.

Dr. Basri talked about the future in Indonesia beyond 2060 if the worst scenario applied. Indonesia, he said, will enter the ageing population range in 2060. Based on the PricewaterhouseCoopers calculation, if Indonesia still only grows 5%/year, then its GDP will still be less than US$30,000 by 2050; thus, failure to reach 6% growth means it risks getting old without becoming prosperous. As most Indonesian exports are primary and resource-based products, it will be hard to sustain growth due to the boom-bust cycle. That is why it is important to move to manufacturing. The relationship between exports that are based on manufacturing and those based on natural resources is the following: (1) There is a negative relationship between medium- and high-technology exports and volatility, meaning that if exports move to that sector, volatility will decrease; and (2) By contrast, dependence on resource-based exports (such as coal, crude palm oil, etc.) means volatility will be high. In short, Indonesia must move to manufacturing supported by good human capital.

The discussion then moved to infrastructure issues, where panelist Prof. Ir. Jusman Syafii Jamal, former Minister of Transport and current President Commissioner of Indonesian Railways Company (PT KAI) presented his views. First, he was concerned about human resource skills, since, based on his 25 years of experience in high technology, it is very difficult to develop high-skilled and competitive labour, as it requires 10 years of experience in the same field to achieve this. However, Indonesian workers are multi-skilled, so this advantage must be maximised.

Collaboration between Japan and Indonesia is a good idea because Japan has the paradigm of *hitozukuri* and *monozukuri*, meaning that it must develop people first before it is able to create a good product. Prof. Jamal said that accelerating the transformation of human capital in Indonesia to achieve the Ministry of Industry's targets requires restructuring the industrial zone. Since Indonesian workers are creative, they need systematic projects and programmes so that they can acquire technology. The first step to realise 'Industrial Revolution 4.0' is to cultivate an innovation-based industrial zone. Workers must then be trained to adapt to change and disruption.

The next panelist was Prof. Ari Kuncoro, the Dean of Faculty Economic and Business, University of Indonesia. He answered the concerns about skills and human capital in his capacity. Prof. Kuncoro thought that the root of low productivity of Indonesia is students' low mastery of mathematics and reading. The solution is to apply the digital revolution, and improve teachers' skills by using massive online open courses. Indonesia has almost 7 million teachers, which is why it needs to use digital technology to improve their skills. However, one of the obstacles of the digital revolution is the negative attitude toward technology. Some still think that new technology is not reliable. Meanwhile, many universities abroad have used digital technology for their teaching and planning, which must become the new model.

Dr. Tri Mardjoko, Dean of Economic Faculty of Dharma Persada University, then addressed collaboration in the field of international negotiation and economic integration, especially trade liberalisation. By the end of 2018, the review process of the Indonesia-Japan economic partnership agreement would conclude. Indonesia and Japan share common membership in many organisations, such as the WTO, Regional Comprehensive Partnership Agreement, etc., and he said that it is advisable for Indonesia and Japan to establish a caucus before entering a negotiation in a trade forum. Indonesia and Japan can identify common interests, especially in technology and human resources development.

Regarding the business environment in Indonesia, Mr. Keishi Suzuki, President Director of JETRO, delivered his findings. According to a survey conducted by JETRO, the business climate in Indonesia is less competitive compared to Thailand, Viet Nam, and China. Some of the issues are: (1) minimal amount of investment requirement, which hinders Japanese SMEs from investing here and developing support industries; (2) rapid increase of labour costs, without concomitant productivity improvements; (3) lack of transparency and predictability in the implementation of laws and regulations; and (4) local contents are increasing, but some important material parts are hard to produce locally so they must be imported.

As such, JETRO has proposed solutions: (1) Understand the contribution of supporting industries to the economy. Since SMEs play a crucial role in manufacturing-based economies, Indonesia must enhance supporting industries and develop their human resources; (2) Improve the competitiveness of local SMEs by allowing foreign SMEs to enter Indonesia; and (3) Improve the business environment by, for example, linking wage increases to actual productivity increases, implementing transparent legal systems, and

improving quality cost delivery of Indonesian products. Mr. Suzuki also mentioned that start-up investments in Indonesia are increasing exponentially. This has made Indonesia a strong player in Asian start-ups. However, problems arise when Indonesian companies rely on China or the US regarding start-up companies. To tackle this challenge, JETRO would like to provide a platform for networking between Japan and Indonesia. Japanese start-ups can be matched with bigger players, while Indonesian start-ups can rely on big trading houses or venture capital.

DAY 2

SYMPOSIUM 3 - To achieve High Quality of Life beyond SDGs 2030

Beyond stable security and economic prosperity, one thing that shall not be left behind is to pursue a higher level of life quality by provision of reliable ICT infrastructure, opportunities to get proper health facilities and education/learning without ignoring the environmental sustainability and creating an enabling environment for local development to reduce inequality.

The last symposium of the second day was entitled 'To achieve high quality of life beyond SDG 2030'. This session further addressed digital technology, human development, climate change, and disaster preparedness. The keynote speech was delivered by H.E. Mr. Rudiantara, Minister of Communication and Information of the Republic of Indonesia. He reiterated the demographic bonus of Indonesia, and how it will have a large consuming class with high purchasing power. Minister Rudiantara said that it was difficult to predict what kind of technology will rise in 2030. Indonesia took a leap forward in deploying technology for its Palapa Ring with some progress; now, there are no municipal cities in Indonesia that are not connected to broadband. Indonesia built communication systems in remote areas by using buffalo caravans to transport antennas because there were no vehicles to bring the equipment to the mountaintops. More than 80,000 of the 260,000 schools in Indonesia are not connected to the internet because it is only used during examinations. Education in Indonesia must maximise the use of the internet during the learning process to promote students' critical thinking. Minister Rudiantara said that Indonesia has more than 17,000 islands that will be connected by satellite communication. In 2017, via a public-private partnership, the government procured a satellite that will be in

its orbital slot by 2020. But, if there is a satellite slot before 2020, Indonesia will lease the capacity to support addressing education and health in meeting the SDGs.

Indonesia will also address the Internet of Things by issuing standardisations in the first quarter of 2019. It needs to improve the quality of life in transportation, agriculture, and properties.

The second keynote speech was made by H.E. Mr. Tsukasa Akimoto, State Minister of Environment of Japan. He mentioned some points of commitment from Japan related to the SDGs. Japan is drawing on its government, private companies, and its teams to achieve the SDGs; further, Japan analyses the profit environment and related activities. Japan improves management and partnerships in Asia, as well as the water quality and quality of life. Japan will establish important agendas by cooperating with countries in managing the environment and will encourage various life-cycle environmental policies and conduct initiatives for Project 2045.

The panel discussion was moderated by Dr. Koki Hirota, who highlighted the importance of ICT. Afterwards, Prof. Dr. Mari Elka Pangestu, former Minister of Trade who holds a position on the Board of Trustees of the Center for Strategic and International Studies explained more about the creative economy. She affirmed that Japan and Indonesia could achieve sustainable development by highlighting several partnerships based on the needs of both of countries, i.e., complementarity and capacity.

The utmost goal is a high quality of life by emphasising the demographic flow of people. In this case, Indonesia and Japan can enhance person-to-person relationships via such endeavours as tourism, education, internships, etc. Japan has a shortage of workers

because of ageing, and Indonesia has human resources, so the two countries can improve both sides' needs. She added that Indonesia now has a place in the transformation of the global value chain, not by the traditional low cost of labour, but through design, ICT-based research, and the fact that increased internet connections will be affordable and high-speed. Innovation and creative economies must be prioritised in this cooperation. Besides regionally, Indonesia and Japan can cooperate on multilateral trade reform. Prof. Mari Elka Pangestu also highlighted the urgency of climate change. After the Fukushima disaster, Japan reduced its commitment to climate change because of the need to replace nuclear energy with coal and other fossil fuels; meanwhile, Indonesia's climate challenge comes from land use and forest fires.

Next, Prof. Arief Anshory Yusuf from Padjadjaran University described regional and social disparities as one root cause for the potential inability to achieve the SDGs. He stated that economic structural change is unfriendly to equality agendas because, for the last 15 years, the movement of labour from agriculture to industry has been stagnant, in what is known as premature industrialisation. Rapid urbanisation by 2045 means that 75%–80% of Indonesians will live in urban areas. The more districts are urbanised, the more unequal they are.

There is no significant agricultural transformation in Java and rural areas never improve because people still think that farming is only about planting. The premature industrialisation that is happening everywhere is not healthy. Externally, Indonesia faces slower global growth and slower global trade. Simultaneously, artificial intelligence (robotisation) is creating new pressures. Factories will move closer to customers and labour will be reduced because of robots. Japan and Indonesia must consider these points: (1) Inequality in Indonesia will be predominantly an urban issue, yet the non-Java region will be the locus of three-quarters of Indonesia's rural population. Any effort must address the urban-rural, Java and non-Java issue; (2) Indonesia will be ageing much later than Japan or other countries, meaning structural changes will have to be inclusive; (3) A potential area for Japan and Indonesia to cooperate is on urban issues. Japan has good

experience with developing urban areas, infrastructure, transportation, reducing private car usage, waste management, etc.; and (4) In line with these, cooperation could be developed in human capital, vocational education, and linking urban areas.

The next presenter was Dr. Titik Anas from Presisi Indonesia. She mentioned about how digital technology can improve the quality of life. Digital technology has changed how people do things, with positive evidence of how it increases productivity, as well as economic growth. Indonesia's Digital Indonesia study shows that the ICT sector is growing very fast and that economic sectors that use technology show higher productivity.

Digital technology and business centre adoption strategies are very important to accelerate growth. However, digital technology has gaps in economic development and access. The middle class of Indonesia adapts fast to technology and is strong with e-commerce, but most of Indonesia lacks appropriate technology. Luckily, there are some platforms to help micro-merchants sell their products, as they are the majority of businesses in Indonesia.

Regarding disaster management and environmental sustainability, Dr. Maxensius Tri Sambodo, Senior Researcher of LIPI, presented his paper. He said that economic growth should apply not only to the material side, but also to the human side, which should be at the centre of development itself. People need to change their ways of managing natural disasters, climate change, and natural resources. Indonesia has a lot of opportunity to do this; unfortunately, history shows that Indonesia is too vulnerable to natural disasters.

Thus, the challenge now is how to change the mindset and develop capacity building to combat that. He advised that Indonesia needs to mainstream disaster reduction into development plans and agendas, and then develop community awareness. The next

challenge will be to review this issue through the poverty and gender dimension because, for example, women usually do not get good treatment following disasters. Indonesia also needs to meet its collective responsibility in central and local government. Finally, he mentioned that Japan and Indonesia can collaborate in developing a sharing culture, bringing knowledge management and developing local people, and learning how to develop sustainable cities from Japan.

Further discussion about disaster management and prevention was delivered by Mr. Ryo Ogawa, Senior Representative of JICA. Drawing on JICA's experience with this issue, he said that data collection is important in planning policies to enhance disaster preparedness. Prof. Hidetoshi Nishimura, President of ERIA, finally closed the symposium with parting remarks. He emphasised the importance of conveying the outcome of Project 2045 to the President of Indonesia and the Prime Minister of Japan, and to further develop projects in line with the vision of both countries. Big applause was heard from the audience, which marked the successful two-day, high-level seminar that brought all the stakeholders and practitioners together to enhance cooperation between Indonesia and Japan to reach their dream in 2045.