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Sector Overview Report on Navigating Opportunities:

NURTURING DYNAMIC ECONOMIC POLICIES IN INDONESIA

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US-ASEAN BUSINESS COUNCIL, INC.

FOREWORD
US-ASEAN BUSINESS COUNCIL

Amb. Ted Osius (ret.)
President & CEO
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Indonesia finds itself at a pivotal crossroads as the world's economy is being reshaped by technological revolutions, climate change, pandemic recovery, and geopolitical tensions. To achieve higher than global average economic growth as part of the Golden Indonesia 2045 vision, Indonesia will need to prepare comprehensive trade and investment plans. The National Long Term Development Plan (RPJPN) 2025-2045 has clearly outlined priorities in poverty alleviation, future-ready human capital development, continuous improvement of governance, fostering economic inclusion, and ensuring ecological resilience. Together, these will position Indonesia for high-income status within the next two decades.

Therefore, as part of our commitment to the Indonesian government, the US-ASEAN Business Council (USABC) — whose 180 member companies are active across ASEAN, including as investors and employers in Indonesia — is proud to partner with *Lembaga Penyelidikan Ekonomi dan Masyarakat Fakultas Ekonomi dan Bisnis*, University of Indonesia (LPEM FEB UI) in presenting this Sector Overview Report, "Navigating Opportunities: Nurturing Dynamic Economic Policies in Indonesia." The report covers seven sectors: Information and Communication Technology (ICT), Health and Life Sciences, Film Entertainment, Travel and Tourism, Trade Facilitation, Energy and Mineral Resources, and Food and Agriculture. Each chapter presents highlights of sectoral topics, in-depth analysis, best practices, and concrete recommendations. Feature stories are the outcome of on-the-ground interviews with practitioners to provide a snapshot of particular sectors.

On behalf of the US-ASEAN Business Council, I would like to extend my appreciation to LPEM FEB UI for its dedication in working with Indonesian government officials, think tanks and USABC members in Indonesia, with particular thanks to Jet Damazo-Santos as the editor of the report. I am confident the Sector Overview Report will provide valuable input for Indonesia's new administration under President Prabowo Subianto and Vice President Gibran Rakabuming Raka, assisting them in achieving their economic priorities.

USABC has represented U.S. private sector interests in Southeast Asia for four decades. We promote mutually beneficial trade and investment opportunities between the United States

and ASEAN member states, including Indonesia. ASEAN remains a cornerstone of regional economic collaboration and integration, playing a crucial role in shaping Asia's trade and financial frameworks. As one of the world's most dynamic regions, ASEAN is an essential hub for global commerce, particularly through its growing engagement with the U.S. business sector. Focus Economics forecasts: "Beyond 2024, ASEAN will be the fastest-growing region in the world in the next decade thanks to foreign investment, infrastructure development, favorable demographics, and the expansion of consumer markets in key trading partners—particularly China and India." USABC recognizes ASEAN's importance in the global value chain and stands ready to support Indonesia as a leading member of ASEAN in navigating the evolving regional dynamics.

Furthermore, USABC has been a key partner to the Indonesian government, facilitating relationships among businesses, offering strategic insights for trade and investment, and providing thought leadership through knowledge that multinational US companies bring from doing business globally. As the Council celebrates 40 years of fostering U.S.-ASEAN business relations, we are fully committed to working with the new administration to support Indonesia in achieving its ambitious economic goals and reinforcing its role in the global supply chain.

Together, we can leverage Indonesia's strengths in the global economy and shape policies that will drive growth and prosperity for the Indonesian people.

Jakarta, October 2024

Amb. Ted Osius (ret.)
President & CEO
US-ASEAN Business Council

FOREWORD
LPEM FEB UI

Chaikal Nuryakin, Ph.D
Director
LPEM FEB UI

Foreign companies, including those from the United States, have played a key role in strengthening Indonesia's economy through investments, technology transfer, job creation, and trade partnerships. Since 2001, U.S. foreign direct investment (FDI) in Indonesia has grown, reaching USD 3,283.11 million in 2023 and contributing 6.53% of the country's total FDI. This relationship underscores the strong economic ties between the two nations. To maximize these opportunities, fostering an investment climate that emphasizes regulatory clarity, drives innovations, and encourages collaboration will support efforts to attract foreign investment and advance long-term economic growth.

This report provides a comprehensive Sector Overview to support Indonesia's newly elected President Prabowo Subianto and Vice President Gibran Rakabuming Raka. It examines seven sectors: Energy and Mineral Resources, Film Entertainment, Food and Agriculture, Healthcare, Information and Communication Technology (ICT), Trade Facilitation, and Travel and Tourism. The report delivers strategic insights, solutions, and actionable recommendations on key topics to foster an environment conducive to growth and collaboration.

On behalf of LPEM FEB UI, I would like to express sincere gratitude to the US-ASEAN Business Council for their invaluable partnership and collaboration throughout this report. I would also like to thank the members of the US-ASEAN Business Council for their valuable contributions and collaborative discussions, which have greatly enriched this report. Additionally, I would like to extend our thanks to all resource persons and participants in the in-depth interviews, whose insights have added significant value to this report.

I would also like to extend my appreciation to the dedicated LPEM FEB UI team members, Jahen F. Rezki, Faradina Alifia Maizar, Yusuf Reza Kurniawan, Teuku Riefky, Difa Fitriani, Arifa Tariqa Imani, Naufal Zaki Arrafif, and Izyan Pijar Bungabangsa Satyagraha, for their hard work and invaluable contributions to this report.

We hope the insights and recommendations provided in this report will assist policymakers in implementing reforms that enhance bilateral cooperation and drive Indonesia's economic growth and prosperity in the future.

Jakarta, October 2024

Chaikal Nuryakin, Ph.D
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EXECUTIVE SUMMARY

This Sector Overview Report, titled "Navigating Opportunities: Nurturing Dynamic Economic Policies in Indonesia," has been prepared by the Institute for Economic and Social Research, Faculty of Economic and Business, Universitas Indonesia (LPEM FEB UI) in collaboration with the US-ASEAN Business Council (USABC). This comprehensive report is designed to inform the new government under President Prabowo Subianto about the strategic opportunities and regulatory challenges in seven pivotal sectors of the economy, providing a roadmap for enhancing economic relations and fostering a dynamic economic environment.

The sectors covered in this report are:

1. Energy and Mineral Resources
2. Film Entertainment
3. Food and Agriculture
4. Healthcare
5. Information and Communication Technology (ICT)
6. Trade Facilitation
7. Travel and Tourism

The methodology for compiling this report involved a multifaceted approach that included literature reviews, in-depth interviews with major stakeholders, in-depth interviews with government representatives, and secondary data analysis. This diverse methodological approach ensures a robust understanding of each sector's current landscape, challenges, and opportunities.

The primary objective of this report is to provide actionable insights and recommendations to the new administration, thereby supporting the development of policies that nurture economic growth, enhance public-private partnerships, and improve regulatory transparency. Through this report, LPEM FEB UI and USABC aim to contribute to the creation of a business-friendly environment that leverages Indonesia's strategic position in the global economy.

Energy and Mineral Resources

Indonesia has made global commitments under the Paris Agreement to reduce national emissions and adapt to the impacts of climate change. To fulfill these commitments, the government could leverage the role of Carbon Capture and Storage (CCS). The country has immense potential to become a regional hub for cross-border CCS (CB-CCS) due to its potentially substantial CO2 storage capacity of up to 700 gigatonnes. However, there are several key aspects to consider to accelerate the development of CB-CCS in Indonesia.

A supportive policy framework that includes market-based principles for commercial terms, investment protection agreements, and safeguards for legal certainty is important for ensuring the success and long-term viability of CB-CCS initiatives in Indonesia. To address

this, the government could: i) Establish enabling regulations based on market principles for commercial terms; ii) Implement investment protection agreements to attract long-term investors; iii) Promote legal certainty by preventing the unilateral revocation of licenses and agreements, and establishing long-term operational agreements; iv) Reconsider provisions, like Article 35 of Presidential Regulation (Perpres) No. 14/2024 that limits imported CO2 to only 30% of the total storage capacity, that reduce the attractiveness of importing CO2 to Indonesia for CB-CCS; and v) Consider revising Article 47 of Perpres No. 14/2024 regarding leakage during CB-CCS operations to align with Indonesia's Nationally Determined Contributions.

Additionally, **strong government-to-government dialogue and cooperation** are crucial. Bilateral negotiations should include detailed stipulations regarding transfer mechanisms, the value of captured CO2, and other CCS implementation procedures. The recent signing of a Letter of Intent between Singapore and Indonesia marks a significant step toward enabling a CB-CCS project. Building on this momentum, further collaborative efforts with other nations should be pursued to strengthen the regional CCS value chain.

Lastly, **securing public support for CB-CCS projects** is critical for the successful adoption of carbon capture efforts in Indonesia. This requires active stakeholder engagement and raising public awareness about the benefits of CB-CCS, including its potential to drive local decarbonization, create jobs, and generate economic opportunities. Transparent communication and inclusive participation will be key to gaining broad public backing. Another important aspect of the energy and mineral resources sector is Indonesia's downstream policy, as mandated by the 2009 Mining Law. The regulation, a key component of the country's industrial development agenda, requires the domestic processing of minerals to promote value addition and economic diversification. The government of former President Joko Widodo announced plans to expand this strategy to other minerals beyond nickel, bauxite, and copper, aiming to further increase economic returns, create jobs, and drive industrial growth. Several key aspects need to be addressed for this expansion to succeed.

First, **strategic planning and preparation for downstream industries** are essential for sustainable development. It is important to develop a comprehensive roadmap for each commodity's downstream sector, taking into consideration the specific economic characteristics and feasibility of each mineral. To address this, the government could: i) Create roadmaps outlining the economic feasibility and reserves of each commodity, ii) Emphasize long-term exploration strategies for securing raw materials, and iii) Expand downstream sectors by transitioning toward manufacturing semi-processed and finished products.

Second, **regulatory alignment and legal certainty** are critical for the downstream industry's growth. Ensuring a streamlined regulatory framework across sectors—including mining, environment, and industry—is key to avoiding conflicting rules and delays. To achieve this, the government could: i) Align supervision and permit processes across ministries, ii) Regularly evaluate downstream policies to ensure effectiveness, and iii) Provide long-term legal certainty through stable mining investment frameworks.

Finally, the **integration of decarbonization measures** into downstream policies can be explored. Establishing CCS infrastructure could enhance the attractiveness of Indonesia's mineral sectors by aligning with global decarbonization trends. This could involve: i)

Developing CCS facilities to support low-emission downstream processing and ii) Attracting global investors by positioning Indonesia as a leader in low-carbon mineral processing.

Film Entertainment

The Indonesian screen industry is recovering well from the COVID-19 pandemic. Driven by growing demand for local content, cinema admissions have surpassed pre-pandemic levels and Online Curated Content (OCC) services are projected to reach USD 500 million in annual revenues by 2025. This industry's economic potential is significant, generating USD 8.2 billion in 2022 and a projected USD 9.8 billion by 2027 while creating spillover effects in sectors like tourism. However, the industry's ability to maximize its potential is constrained by issues such as a shortage of skilled workers in the industry, infrastructure gaps, and insufficient government support.

One of the main challenges facing the Indonesian screen industry is **the shortage of skilled professionals in both technical and creative roles**, particularly in high-demand positions such as screenwriters, producers, and directors. To address this, the government could: i) Collaborate with industry associations and international institutions to provide targeted training programs; ii) Align formal education with the evolving workforce needs; iii) Expand on-the-job training opportunities; iv) Raise awareness of diverse career paths in the digital creative industry; and v) Involve multiple ministries, such as the Ministry of Youth and Sports and the Ministry of Manpower, in supporting workforce development initiatives for the film and TV industry.

Another critical aspect is **the need to accelerate investment in film industry infrastructure**. To achieve this, the recommendations include: i) Expanding the network of cinemas across the country; ii) Increasing post-production facilities to boost local content creation; iii) Identifying sites for new studios and production developments; iv) Utilizing pop-up production spaces to attract more projects; v) Establishing a location library and database to promote Indonesia's diverse landscapes for filmmaking; vi) Expanding broadband access for equitable content distribution online.

The lack of clear design and implementation of movie production incentives in Indonesia hinders the country's ability to attract both local and foreign filmmakers, making it less attractive compared to other countries in the region. To address this, the Indonesian government could: i) Implement straightforward, transparent, and efficient cash rebate schemes for both local and foreign filmmakers; ii) Offer additional incentives for employing local crews, conducting post-production domestically, and promoting lesser-known locations; iii) Scale rebates based on production budgets and filming duration to attract longer projects; and iv) Introduce a Location Scouting Support program to cover costs for international productions planning to film in Indonesia.

Aside from these, **the complexity of the regulation and permit application process for filmmakers** in Indonesia hampers efficient production workflows. To address this, the government could: i) Centralize the authority responsible for issuing permits to streamline coordination; ii) Combine central and regional permits to expedite the process; iii) Enhance coordination between relevant institutions; and iv) Establish clear leadership within the Ministry of Culture (previously part of the Ministry of Education, Culture, Research, and Technology),

the Ministry of Tourism and the Ministry of Creative Economy (both previously part of the Ministry of Tourism and Creative Economy/MoTCE) to provide filmmakers with proper guidance.

Food and Agriculture

Agriculture is essential to Indonesia's socio-economic framework, contributing an average of 13.22% to GDP from 2010 to 2023 and providing livelihoods for approximately 28.21% of the workforce. Despite a gradual decline in its GDP contribution over the years, the sector still plays a crucial role in food security by supplying staple crops and raising farmers' incomes, thereby reducing poverty, particularly in rural areas. Hence. Indonesia's 2045 development framework (Visi Indonesia 2045) prioritizes food security and improving farmers' welfare, with the aim of significantly enhancing productivity by 2045. It outlines key strategies including developing agricultural education, integrating sector policies, improving farmer institutions, and increasing investments in infrastructure. These initiatives aim to create a self-reliant food security system while enhancing the financial condition and livelihoods of farmers. Furthermore, self-sufficiency in food is a central aspect of President Prabowo's Asta Cita campaign platform, reflecting a commitment to achieving national independence and sovereignty.

Enhancing agriculture productivity to achieve food sovereignty and farmers' resilience goals requires a transformative approach in how the government provides support to farmers. Two critical aspects that the government can focus on are reforming the subsidy strategy and accelerating the adoption of seed technologies, like genetically modified (GM) products.

Currently, **Indonesia's seed subsidy program faces challenges such as inefficiencies in distribution, limited access for farmers, and fluctuating subsidy values.** Many farmers receive minimal assistance and report lower yields compared to those who do not participate in these programs. To address these issues, the government may consider: i) Encouraging greater private sector participation in seed production through public-private partnerships (PPPs), ii) Implementing a robust monitoring and evaluation framework to help assess program effectiveness, and iii) Enabling data-driven adjustments based on feedback from farmers and stakeholders.

Credit assistance offers greater versatility for farmers in Indonesia compared to seed subsidies. Issues with seed quality and distribution timing hinder the effectiveness of seed assistance, while credit assistance more effectively addresses the various challenges farmers face. This study observes that farmers allocate capital differently based on local conditions, indicating that credit assistance could significantly enhance productivity by allowing more flexible investment decisions. Given this, the government is encouraged to: i) Prioritize the expansion of credit assistance programs like People's Business Credit (*Kredit Usaha Rakyat*, KUR), alongside simplifying loan application procedures and increasing financial literacy among farmers; ii) Enhance the role of agricultural extension services (PPL) to better support farmers in adopting new technologies and practices; and iii) Build a more competitive seed industry through public-private partnerships that could ensure the availability of high-quality seeds.

Another issue is **the adoption of GM products in Indonesia, which faces challenges such as regulatory inefficiencies, public scepticism, and limited support for farmers.** There used to be concerns regarding dependency on GM seeds from multinational corporations, but these are becoming less relevant as state-owned enterprises (SOEs) have initiated research and development efforts to produce locally adapted GM varieties. To further facilitate the integration of GM products, it is crucial to: i) Overhaul the existing regulatory framework by streamlining approval processes and establishing a centralized body, such as the Biosafety Commission, to manage all aspects of GM product oversight: ii) Develop a comprehensive roadmap for GM adoption to provide strategic guidance for stakeholders and outline timelines for regulatory reforms and public awareness initiatives; iii) Increase government involvement in post-commercialization monitoring, alongside enhanced budgetary support for R&D, to ensure safety standards and promote innovation tailored to local needs; and iv) Conduct targeted public awareness campaigns, leveraging accessible online resources and engaging various institutions, to inform and educate the public about the benefits and safety of GM products, thereby fostering acceptance and informed decision-making.

Healthcare

The healthcare landscape in Indonesia has been undergoing significant transformation to improve the overall quality of healthcare, enhance accessibility, and prioritize preventive care. The National Medium-Term Development Plan (RPJMN) outlines two main health-related goals: accelerating improvements in community nutrition and strengthening the healthcare system, including medicine and food control. Therefore, for the healthcare sector, this report focuses on two key aspects: First, government initiatives related to nutrition interventions for stunting prevention and eradication. Second, the role of innovative medical devices in improving health accessibility and treatment.

The new administration has announced plans to introduce a “free meals” program to address the low nutrition and stunting problems in Indonesia. Therefore, it is **imperative to ensure the nutritional value of the nutritional value meals included in the program and evaluate its beneficiaries**. This entails considering issues such as the low intake of essential amino acids and concerns about the program’s nutritional quality, how stunting stems from deficiencies in pregnant mothers and children under five, and the efficacy of the program if it initially targets pre-school, elementary school, middle school, high school, and boarding school students. To address this, the government could: i) Ensure the free meals program contains a high protein ratio from animal-sourced food (such as milk, egg, chicken, fish, etc.); ii) Include high-protein medication for stunted children under the Processed Food for Special Medical Needs (PKMK) or Food for Special Medical Purposes (FSMP) program in reimbursement and funding.

Furthermore, there are concerns about **the lack of clear mechanisms for private sector involvement and the need to develop tools to monitor and evaluate the costly program**. Currently, there are no regulations governing the procurement of nutritional food to combat stunting. Thus, it is recommended that the government: i) Include specific scientific guidelines for procurement, budget allocation, and program collaboration to leverage the private sector's capacity to supply high-protein nutritional products, and ii) Develop monitoring and evaluation tools to ensure the “free meals” program’s effectiveness and efficiency in reducing stunting.

A **robust long-term roadmap and strategy are also needed to develop the domestic medical devices industry**. The government is encouraged to: i) Develop a long-term roadmap for the medical devices industry, ii) Conduct industrial mapping to assess the capacity and availability of resources/inputs to support domestic medical device production, ii) Use the industrial mapping to identify feasible medical devices that can be produced in Indonesia and shift away from the current one-size-fits-all local content requirement (LCR) approach.

In addition, there is a need to create a coherent and supportive regulatory framework and environment for the development of the domestic medical device industry. Currently, **the regulatory pathways are not streamlined, the LCR policy is counterproductive, and the industrial environment has not yet adequately supported growth and innovation in the medical device industry**. To address this, the government is encouraged to: i) Relax policies related to AKLs (imported medical devices) to align with the priorities in Indonesia's Health Transformation Pillars, ii) Implement the LCR policy in stages and regularly review and update it, iii) Develop a detailed Indonesia medical devices dictionary (KFA) to guide LCR policy implementation, iv) include various forms of company contributions in calculating local content, v) Provide incentives for innovation and R&D and encourage collaboration between academia, industry, and healthcare providers, and vi) Support market expansion and promote public-private partnerships.

Information and Communication Technology

Indonesia's digital economy has experienced remarkable growth, increasing over 400% from 2017 to 2021, and is projected to rise by 62% from 2021 to 2025. This transformation, enabled by widespread internet access exceeding 97% in 2022, impacts all societal layers and is integral to the Visi Indonesia Emas 2045 initiative. Moving forward, the sector's growth relies on addressing issues in the areas of digital infrastructure, including data centers, telecommunication infrastructure, artificial intelligence (AI), and data governance.

Data centers are essential to digital infrastructure, providing flexibility, resource sharing, and reduced costs. However, they require high investment costs, access to energy and renewable energy, and high-speed internet connection. For data centers providing hyperscale storage services, the facilities tend to be state-of-the-art and purpose-built to meet individual requirements, **requiring certainty and a long-term revenue stream to remain profitable**. Another **driver of cloud business investment is a regulatory environment that enables the free flow of data**. For investments in the cloud business to be viable, regulations should also give customers and users the flexibility to make their own choice of location for data storage and processing. **The regulatory environment, which is marked by forced localization and inconsistent policies, may deter foreign investment and limit the growth potential of the ICT sector** despite its significant economic contribution. Overly restrictive barriers for cross-border data transfers constrain the potential for developing countries to reap the benefits of exporting data-intensive services as the demand for digital services grows. Import restrictions and tariffs on high-tech hardware and equipment, which are often not produced locally, may also impede the growth of the data center industry. Although Indonesia is a member of the WTO Information Technology Agreement (ITA), it faces difficulties in fully

capitalizing on its benefits (e.g., integration in the ICT supply chain) due to compliance challenges causing regulatory uncertainty and disincentivizing investments.

To enhance data center infrastructure in the country, the government could: i) Prioritize collaboration with the private sector, leveraging its resources and expertise to improve connectivity and position Indonesia as a regional hub; ii) Avoid implementing data localization policies; and iii) Consider eliminating import tariffs and restrictions on high-end ICT hardware and equipment to support further growth in data center industry, broader digital economy and other related downstream sectors (e.g., digital skilling, AI start-ups, domestic advanced manufacturing, etc). It is equally important to iv) Foster an enabling environment for data center development and operation by streamlining and simplifying multiple permitting processes and increasing the certainty of the regulatory landscape for investors.

Telecommunication infrastructure development in Indonesia still faces several challenges**.** The country's archipelagic nature complicates the rollout of digital networks, necessitating substantial investment in specialized equipment for remote areas. Regulatory hurdles, including complex permitting processes and local government levies, further impede progress. Additionally, **spectrum availability and high spectrum costs**, which constitute approximately 12% to 14% of telecom operators' revenue, are higher than the global average of 10%, **slowing down the rollout of 5G services and limiting market competition and network quality**. To address these issues, it is important for the government to: i) Harmonize regulations and potentially provide financial incentives for spectrum usage, which could enhance the telecommunications landscape in Indonesia; and ii) Immediately roll out the low-band spectrum (700 MHz) for broad coverage and rural penetration, the mid-band spectrum (2.6 GHz and 3.5 GHz) for a balance of speed and coverage in urban areas, and the high-band spectrum (26 GHz and 28 GHz) for delivering ultra-fast speeds and high capacity in dense urban environments. In addition, iii) The Ministry of Communication and Digital Affairs (MoCDA), previously known as Ministry of Communication and Informatics (MoCI), should shift from its operational role to focus on regulation and oversight. This transition would relieve MoCI of non-tax state revenue (PNBP) targets, potentially leading to more competitive spectrum pricing and increased private sector participation in Indonesia’s digital transformation initiatives.

AI offers significant growth potential for Indonesia, but **its adoption has been hindered by underdeveloped infrastructure, including high-speed internet, 5G networks, and advanced data centers.** The government's strategy of providing guidance on AI governance through a circular letter, rather than imposing strict regulations, is appropriate for the current stage of AI development; however, as the technology evolves, a tailored legal framework for each subsector is necessary to avoid stifling innovation with a "one size fits all" approach. To encourage responsible AI growth, Indonesia could i) Implement a risk-based regulatory framework focused on sector-specific use cases and establish mechanisms for public-private data sharing to create data-rich environments; ii) Develop robust frameworks for AI ethics, fairness, inclusiveness, transparency, and security to ensure safe and responsible deployments; and iii) Align AI regulations with international best practices, such as those in the ASEAN Guide on AI Governance and Ethics, to maintain competitiveness in the global AI landscape.

Indonesia's Personal Data Protection (PDP) Law No. 27/2022 lays out a comprehensive framework for personal data governance but faces several implementation challenges. The roles and responsibilities of data controllers and processors are not entirely clear, leading to uncertainty, especially as data processors lack visibility into the data they manage. The short response times given for data controllers to fulfill requests and its broad breach notification requirements further complicate compliance. Recommendations to improve data governance include: i) Reducing restrictions on cross-border data transfers to support AI development, upholding strong data protection measures, and clarifying the establishment and responsibilities of the PDP implementing agency. ii) The PDP Law could also benefit from adopting elements of GDPR, particularly in streamlining the obligations of data controllers and processors to enhance compliance efficiency and reduce unnecessary administrative burdens.

Trade Facilitation

Indonesia's trade climate has faced significant challenges due to the implementation of two critical regulations by the Ministry of Trade. Regulation No. 31/2023 (Regulation 31) benefits local SMEs in the short term but does little to support their long-term sustainable growth and has had unintended consequences of limiting Indonesian consumer choices. Local industry experts say it is more productive for the government to invest in public-private sector partnership programs and initiatives to help develop SME digital capabilities and drive international growth.

To promote the growth and development of local SMEs, countries such as Vietnam, Thailand, Malaysia and Singapore provide supportive programs and incentives that encourage SMEs to take advantage of cross-border e-commerce opportunities and enhance their competitiveness against foreign counterparts. We recommend that the government revisit Regulation 31 and consider the following: i) Remove the USD 100 ban on e-commerce imports, ii) Assess the viability of imposing VAT on imported e-commerce goods, iii) Partner and leverage foreign e-commerce platforms to empower local SMEs to grow locally and internationally, and iv) Cultivate an open e-commerce environment that adopts global industry best practices, promotes innovation, and a level playing field for both local and foreign businesses to succeed through deeper public-private sector dialogue.

In addition to Regulation 31, the government also imposed other restrictive measures, or non-tariff barriers, on various imported commodities, intending to shield local manufacturers from foreign competition. One of the main changes is Regulation 36, which saw **significant and frequent changes that exacerbated the complexity of Indonesia's import policy and trade restrictions**. While the changes are intended to protect domestic consumers and encourage the growth of domestic industries, they increase trade barriers, which could be a massive impediment to long-term growth and development. Therefore, the recommendations for the government include: i) Creating a more coherent long-term trade policy strategy and ii) Enhancing the quality and transparency of trade policy formulation and implementation. The policymaking process and formulation should refer to a higher-level ecosystem industrial strategy and be conducted more deliberately with adequate room for public consultation. In particular, it would be beneficial to: iii) Ensure that information on tariffs and other trade

measures, including licensing requirements and quota allocation formulation, are easily accessible; iv) Streamline and integrate the import administration system, including reducing paperwork and providing real-time information on requirements to avoid delays and confusions; and v) Seek input from and collaborate with the private sector, both domestic and foreign direct investors.

Travel and Tourism

Tourism is recognized as an important contributor to Indonesia's economic growth, particularly in Bali where it accounts for approximately 61% of Gross Regional Domestic Product, creating substantial employment opportunities. However, increasingly, this growth has been concentrated in certain destinations, especially in southern Bali. **Dispersing tourism more effectively—through improved infrastructure, capacity building in secondary destinations, and partnerships with communities and the private sector to encourage responsible travel — will ensure tourism remains a positive force for driving Indonesia's future**.

The government has implemented several strategic initiatives to promote sustainable tourism practices. These include the development of five "Super Priority Destinations" (DSPs) across Indonesia. This initiative aims to decentralize tourism activities away from Bali, thereby alleviating the pressure on its infrastructure and spreading economic benefits to other regions. Another significant effort is the Tourism Village program, designed to boost local economies, preserve cultural and natural heritage, and distribute tourism benefits more equitably.

The development of DSPs is progressing but continues to face several challenges, including infrastructure limitations and unresolved land disputes. Local authorities lack the authority to build critical infrastructure, discouraging investment, while land disputes with local communities have also stalled development. Similarly, **the Tourism Village program has made progress in promoting sustainable tourism across Indonesia, but challenges persist in human resource development, the identification of unique tourism offerings, and infrastructure disparities.** Many tourism villages still lack skilled personnel and struggle to highlight distinctive features that would attract visitors, undermining their appeal. Additionally, infrastructure deficiencies result in uneven access to tourism sites, hindering economic growth in certain regions.

To improve the effectiveness of these programs, there are several recommendations that can be adopted by the government. i) Urgent infrastructure development is necessary to enhance accessibility and improve visitor experiences across all tourism destinations, ensuring equitable benefits from tourism. Additionally, ii) Equipping the local populace with skills in hospitality, business management, and eco-tourism through education and comprehensive training programs can strengthen the local workforce and promote sustainable practices. iii) Promoting cultural heritage, local events, and festivals and iv) Educating tourists about responsible travel can preserve heritage and enhance the overall tourism experience.

Furthermore**, it is crucial to foster public-private partnerships to drive the success of such programs. Enhanced collaboration between the government, local communities, and the private sector can help to direct tourism more equitably within Indonesia. The private sector can support through capacity-building initiatives, promoting secondary**

destinations and unique cultural festivals to a global audience, committing to initiatives that preserve local heritage, and supporting education for tourists about responsible travel practices. A collaborative effort can create a balanced tourism ecosystem that benefits all stakeholders involved, ultimately ensuring the long-term sustainability of tourism in Indonesia.

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Chapter I

Energy and Mineral Resources Sector

1. Cross-Border Carbon Capture and Storage

Key Highlights

- Carbon capture and storage (CCS) plays a pivotal role in helping Indonesia meet its global commitment to reduce emissions by 31.89% unconditionally and 43.20% conditionally by 2030. With an estimated CO2 storage capacity of up to 700 gigatonnes (Gt), Indonesia holds immense potential to become a regional hub for cross-border CCS (CB-CCS).
- The government of Indonesia has issued a new presidential regulation that provides the legal basis and broader framework for developing CB-CCS in the country (Perpres No. 14/2024). While the related implementing regulation at the ministerial level is being drafted, several important aspects and insights must be considered.
- To capitalize on the opportunity CCS presents, Indonesia must act swiftly to position itself as a key player in regional and global decarbonization efforts.
- Strengthening policy frameworks and enabling regulations remain a critical factor in the success of CCS initiatives. It is vital that policymakers embrace market-based principles to determine commercial terms. Implementing investment protection agreements will further enhance Indonesia's attractiveness to investors and ensure the long-term viability of these investments.
- Strong government-to-government dialogue and cooperation are essential. Moreover, securing public support is crucial for the success of CCS projects. This requires active stakeholder engagement and raising public awareness about the benefits of CCS, including its potential to drive local decarbonization, create jobs, and generate economic opportunities.

1.1. Overview

Indonesia has made global commitments under the Paris Agreement to reduce national emissions and adapt to the impacts of climate change. According to its Nationally Determined Contributions (NDC) documents, Indonesia has set its 2030 emission reduction targets relative to a business-as-usual (BAU) scenario at 31.89% unconditionally and 43.20% conditionally.[1] These targets represent an increase from the previous commitments of 29% and 41%, respectively.[2] The Indonesian government has identified five priority sectors for emission reduction: energy, forestry, waste, agriculture, and industrial processes and product use (IPPU).

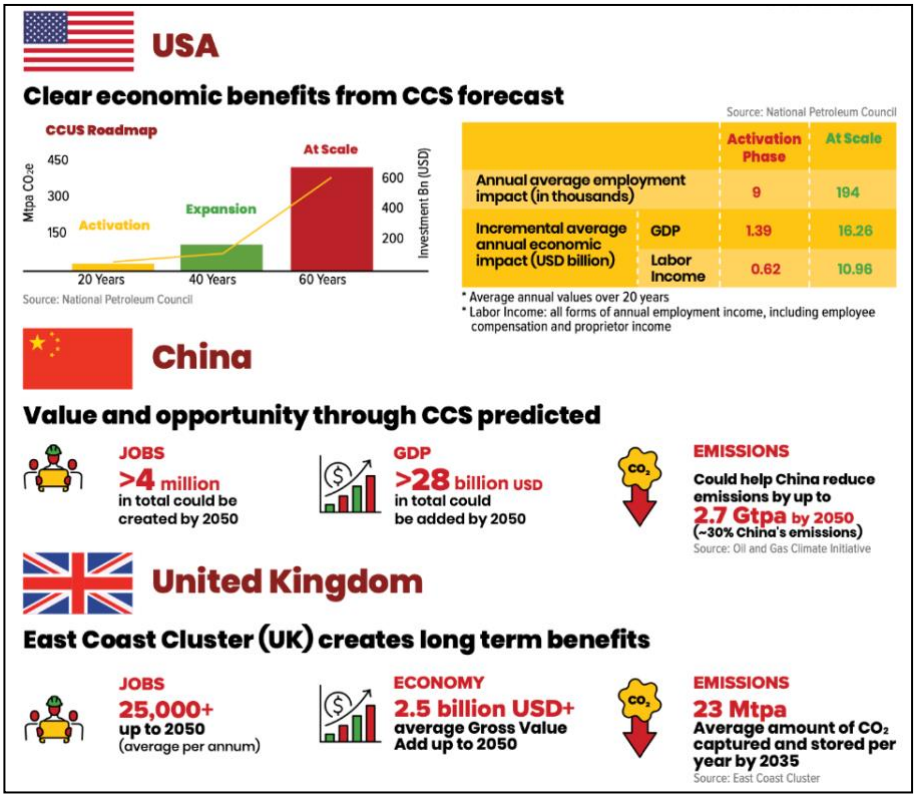
Given the magnitude of these commitments, Indonesia must leverage all available avenues for reducing emissions, including the deployment of CCS. An International Energy Agency (IEA) study estimated that Indonesia needs to deploy CCS to capture 6 million tonnes (Mt) annually by 2030 and 190 Mt annually by 2060 to meet its 2060 net-zero emissions target.[3] According to ExxonMobil, Indonesia's total emissions from the energy sector are estimated to be around

[1] Government of Indonesia. (2022). *Enhanced Nationally Determined Contribution Republic of Indonesia*.
[2] Government of Indonesia. (2021). *Indonesia Long-Term Strategy for Low Carbon & Climate Resilience 2050*.
[3] International Energy Agency. (2023). *Carbon Capture, Utilisation and Storage in Indonesia: Policy Brief*.

400-600 Mt annually.[4] From an economic feasibility perspective, the commercialization of CCS should prioritize sectors with high-concentration emissions, such as energy, while also exploring opportunities in sectors with lower-concentration emissions, such as steel production.

The benefits of CCS projects are clear. The Carbon Capture, Usage, and Storage (CCUS) Roadmap in the US estimates that CCUS will create an annual average of 9,000 jobs during the activation phase and 194,000 jobs when deployed at scale. Additionally, the incremental annual GDP impact is projected to be USD 1.39 billion (IDR 22.24 trillion)[5] during the activation phase and USD 16.26 billion at scale. In China, CCS projects are expected to create more than 4 million new jobs and add more than USD 28 billion to the country's GDP by 2050. Meanwhile, CCS projects in the UK's East Coast Cluster alone are projected to create 25,000 new jobs and add USD 2.5 billion to the UK's Gross Value Added by 2050.

Figure 1: Multiplier Effect of CCS Projects



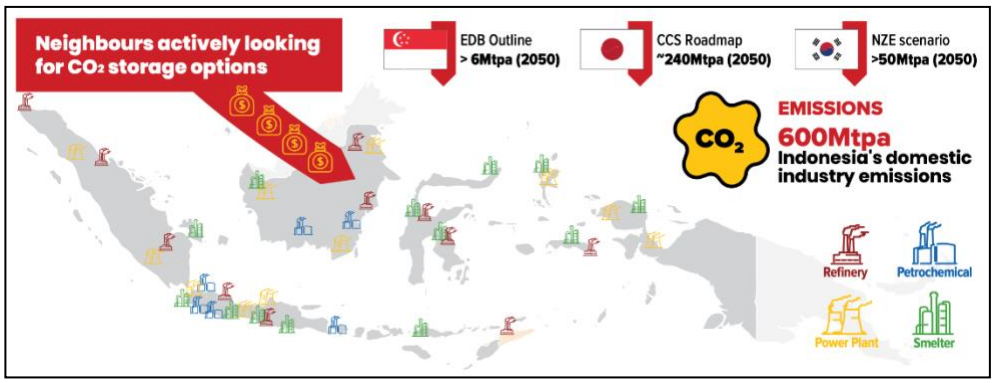
Source: Indonesian Petroleum Association (2024)

Indonesia holds immense potential for CCS, with an estimated CO2 storage capacity of up to 700 Gt.[6] The initial deployment of CCS technology in Indonesia focused on the oil and gas sector, supporting gas field development. While the commercialization of CCS should prioritize high-concentration emission sectors before extending to low-concentration emission sectors from an economic perspective, the rapid deployment of CCS technology to other sectors through the establishment of CCS Hub can significantly reduce emissions from hard-to-abate

[4] Interview with representatives from ExxonMobil.
[5] USD 1 = IDR 16,000
[6] Indonesian Petroleum Association. (2024). *Gaining Momentum to Advance Sustainable Energy Security in Indonesia and the Region*. IPA Infographic Booklet. The 48th IPA Convention & Exhibition.

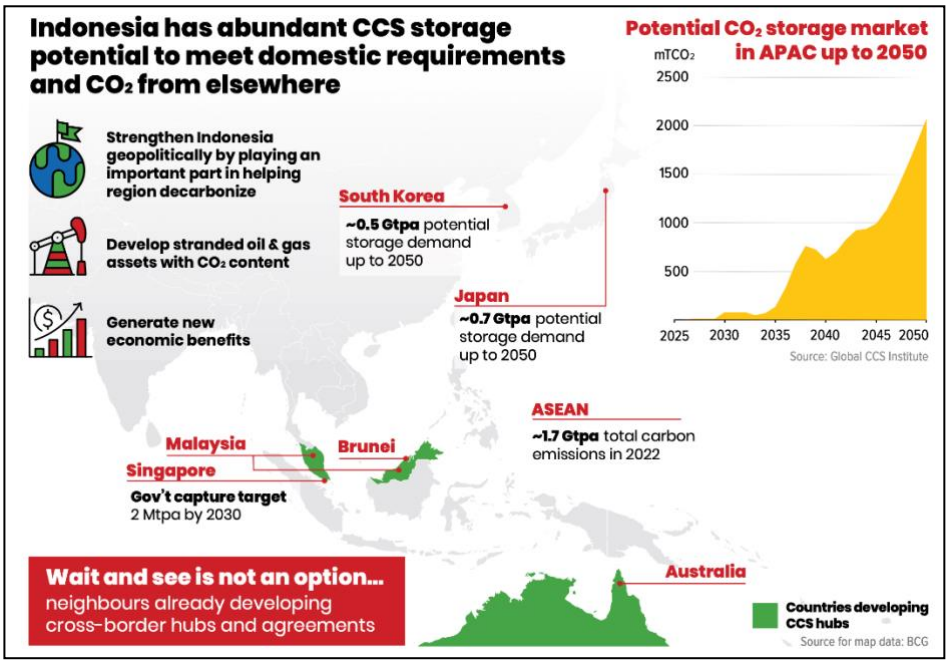
industries. To initiate CCS projects, Indonesia could implement cross-border CCS (CB-CCS) by accepting carbon from advanced economies that can afford CCS technology and storing it domestically. Neighboring countries are also exploring CO2 storage options to meet their climate targets. According to the Singapore Economic Development Board, the country aims to capture 2-2.5 Mt per annum (Mtpa) of CO2 by 2030 and over 6 Mtpa by 2050. Japan's CCS Roadmap targets the capture of 240 Mtpa of CO2 emissions by 2050, while South Korea's Net Zero Emissions (NZE) scenario plans to capture more than 50 Mtpa of CO2 by the same year.

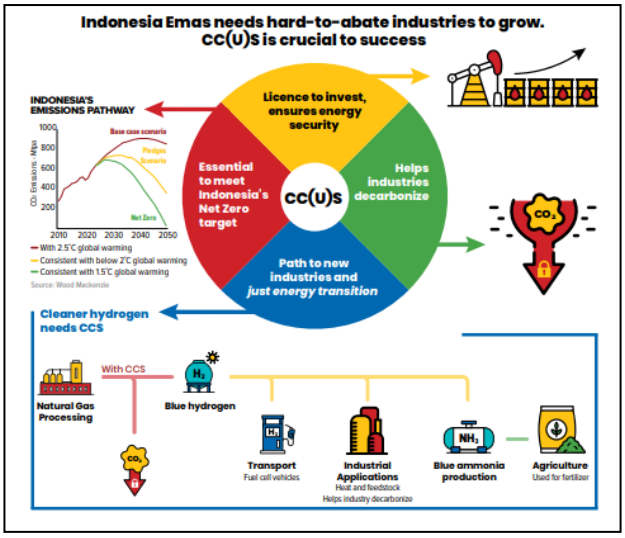
Figure 2: Projected CO2 Emissions in Neighboring Countries



Source: Indonesian Petroleum Association (2024)

Figure 3: Potential CO2 Storage Market in Asia Pacific





Source: Indonesian Petroleum Association (2024)

In response to this potential, the government has begun establishing the legal foundation for CB-CCS by issuing Presidential Regulation (Perpres) No. 14/2024. This provides a broader regulatory framework for the implementation of CCS in Indonesia, including provisions for storing carbon from abroad.

To capitalize on CB-CCS, Indonesia needs to quickly activate its vast storage resources and establish first-mover projects or proof-of-concept initiatives. These efforts can serve as a catalyst, attracting further investment in emerging blue industries (such as hydrogen, ammonia, and biofuels) and green premium industries (zero-emission steel, minerals smelting, petrochemical, cement, and electricity).

1.2. Key Regulations on Cross-Border CCS

The Indonesian government has introduced two key regulations governing the development of CCS projects. According to government officials, Indonesia's regulatory framework is considered advanced compared to those of other Southeast Asian countries.

Before the enactment of Perpres No. 14/2024, the regulatory framework for CCS in Indonesia was governed by a ministerial regulation (Permen ESDM No. 2/2023). This regulation outlines detailed monitoring and reporting requirements, as well as financial and business model considerations, offering pathways for projects and their partners to monetize carbon credits. However, its scope is limited to Indonesia's oil and gas sector, specifically relying on upstream exploration and production companies to spearhead CCS development and operations. This limitation highlighted the need for a more comprehensive CCS framework.

To address this, Perpres No. 14/2024 was introduced to provide a more comprehensive foundation for CCS, with an expanded regulatory framework for CB-CCS. Specifically, it allows contractors and storage operation license holders to allocate up to 30% of their total storage capacity for CB-CCS. The regulation also outlines general procedures for CB-CCS provision. However, many of the technical aspects of CB-CCS implementation remain to be defined, as these will largely depend on bilateral agreements between Indonesia and partnering countries.

The Ministry of Energy and Mineral Resources (MEMR) is in the final stages of drafting the implementing regulation to follow up on Perpres No. 14/2024.

1.3. Key Issues on Cross-Border CCS

CCS could play a pivotal role in helping Indonesia meet its global climate commitments. While the Indonesian government has begun to recognize the country's potential in CCS and has taken initial steps to provide the legal framework for its implementation, several key issues remain.

The first set of issues relates to the inherent nature of CO2 emissions. It is important to understand that not all CO2 emissions are currently economically feasible to capture. For example, the cost of directly capturing carbon from the air remains prohibitively expensive. CCS is primarily targeted at industries with high concentrations of CO2, where the cost of mitigating emissions is already factored into the basic operating expenses. Another challenge is that CO2 has no inherent value, unlike oil and gas, which have intrinsic values derived from their combustion capacity. This situation is likely to persist until public awareness and understanding of CCS' critical role in climate mitigation improves.

The second set of issues concerns the characteristics of the CCS business itself. CCS is a long-term, capital-intensive investment. Injecting carbon into the ground safely and securely requires extensive geological surveys and inspections, with costs that could exceed those associated with upstream oil and gas well analysis. The CCS industry must be guaranteed the right to access geological pore spaces for CO2 storage, with mechanisms in place to ensure that these rights are not arbitrarily revoked. While long-term licenses and investment agreements are preferable, it is crucial to note that even these can be revoked under certain conditions. Therefore, a robust operational agreement between the government and investors is essential to providing long-term legal certainty, ensuring the security of these investments over time. Additionally, given the long-term nature of CCS investments, the provision of stable financial or fiscal incentives over a 20- to 30-year period is critical to the viability of these projects.

The unequal distribution of geological pore spaces across the globe makes CCS a global issue by nature and international collaboration a necessity. In the case of Indonesia, Perpres No. 14/2024 provides a legal basis for the cross-border transfer of carbon to be stored within its borders. However, some of its provisions may still hinder CO2 imports if not clarified through implementing regulations. For example, the regulation allocates 30% of the total storage capacity for CO2 from abroad, but the implementing regulation should clarify that this allocation is based on storage capacity instead of injectivity to ensure that CO2 import projects can proceed smoothly, regardless of the readiness of domestic emitters.

Additionally, leaks during transportation should not be added to Indonesia's greenhouse gas (GHG) inventory. Therefore, the implementing regulation should clarify that transboundary CO2 accounting will follow applicable international principles or be defined by bilateral agreements. Another critical aspect of the implementing regulation should be the emphasis on guaranteeing cross-border operators' liability in the event of carbon leaks. This can be achieved by ensuring that operators have robust prevention and mitigation mechanisms in place.

Furthermore, the fight against climate change requires international collaboration. Solutions to climate problems cannot be provided by a single country and necessitate global cooperation. Governments around the world should focus not only on reducing their own emissions but also on contributing to global reduction efforts. If countries prioritize only their own emissions, the planet will still face catastrophic consequences. By developing CB-CCS and allowing other countries to store their CO2 emissions within its territory, Indonesia could make a significant contribution to global climate initiatives, while also reaping economic benefits from this collaboration.

On the issue of public acceptance of CO2 importation, an interview with government officials highlighted the need for public promotion and socialization of CCS technology. For example, while carbon emissions are generally perceived as pollution, the CO2 injected in a CCS project will undergo a treatment process to increase its purity.

A 2022 study by the Economic Research Institute for ASEAN and East Asia (ERIA) outlines that a comprehensive CCS legal and regulatory framework should address four key aspects: coverage, issues, scope, and approach.

Table 2: Aspects of a Comprehensive CCS Legal and Regulatory Framework[7]

Aspect	Main Idea
Coverage	A comprehensive CCS legal and regulatory framework must encompass the entire project life cycle, clearly defining the roles and responsibilities of each participating party at every stage of a CCS project.
Issues	Legal and regulatory frameworks should address specific barriers related to CCS projects. Some barriers can be resolved by coordinating with existing regulations where applicable.
Scope	The legal and regulatory frameworks for CO2-EOR (enhanced oil recovery) and CO2-CCS operations differ because their objectives are distinct.
Approach	The development of CCS legal and regulatory framework varies across countries. This can involve adapting existing regulations from the oil and gas sector, creating dedicated CCS regulations, or tailoring regulations specific to individual CCS projects.

Source: Adapted from ERIA (2022)

1.4. Best Practices on Cross-Border CCS

Two countries that can serve as valuable references for enhancing CCS and CB-CCS practices in Indonesia are Australia and Canada. Australia is an excellent example for CCS, and Canada for CB-CCS.

[7] ERIA. (2022). Regulatory and Policy Study in Kimura, S., Shinchi, K., Coulmas, U., and Saimura, A. (eds.), *Study on the Potential for Promoting Carbon Dioxide Capture, Utilisation, and Storage (CCUS) in ASEAN Countries Vol. II*. ERIA Research Project Report FY2021 No. 2, Jakarta: ERIA, pp. 23-35

1.4.1 Australia

Australia stands out as a model for best practices in CCS due to its comprehensive and multi-level approach to CCS legislation. The country has developed standalone CCS regulations at federal, state, and project levels, providing a robust legal framework to support and regulate CCS activities.[8] The Offshore Petroleum and Greenhouse Gas Storage Act governs CCS operations at the federal level, setting the stage for consistent nationwide regulation. At the state level, Victoria's Greenhouse Gas Geological Sequestration Act 2008 offers specific regulations tailored to the state's needs. On a project level, the Barrow Island Act 2003 applies to the Gorgon Project, covering both onshore and offshore operations within three nautical miles.

Australia's legal frameworks include coherent processes for selecting underground storage sites, permitting exploration and storage activities, monitoring and reporting, and addressing liability and financial security provisions, and the closure and long-term stewardship of storage sites. The Barrow Island Act serves as an exemplary model of CCS project-specific legislation, effectively regulating the operations of Western Australia's Gorgon CO2 injection project. This project-specific approach ensures that unique requirements and challenges are addressed comprehensively, facilitating efficient and effective CCS implementation.

Additionally, the Western Australian state government introduced the Petroleum Legislation Amendment Bill, which integrates the transport and storage of greenhouse gases into current state legislation. This amendment aims to provide the industry with opportunities to decarbonize through CCS, further enhancing Australia's legislative framework for CCS. By incorporating CCS into existing petroleum legislation, the state government ensures a seamless transition for industries looking to adopt CCS technologies, promoting widespread adoption and facilitating the country's decarbonization efforts.[9]

1.4.2 Canada

Canada exemplifies best practices in CB-CCS through the Weyburn Carbon Dioxide Sequestration Project, one of the largest CCS initiatives worldwide. Since September 2000, CO2 has been transported from the Dakota Gasification Plant in North Dakota, USA, via a 320-km pipeline and injected into the Weyburn oilfield in Saskatchewan for enhanced oil recovery operations. This site also hosts the IEA GHG Weyburn-Midale CO2 Monitoring and Storage Project. As a founding member, Canada, along with numerous private and public sector partners, contributes to one of the largest international projects for CO2 measurement, monitoring, and verification.[10]

Canada's policy and regulatory framework for carbon management is frequently hailed as one of the most enabling environments globally, particularly for CB-CCS. The federal government's implementation of an economy-wide carbon-pricing system significantly improves the

[8] ERIA. (2022). Regulatory and Policy Study in Kimura, S., Shinchi, K., Coulmas, U., and Saimura, A. (eds.), *Study on the Potential for Promoting Carbon Dioxide Capture, Utilisation, and Storage (CCUS) in ASEAN Countries Vol. II*. ERIA Research Project Report FY2021 No. 2, Jakarta: ERIA, pp. 23-35
[9] Global CCS Institute. (2023). *Global Status of CCS 2023.*
[10] Mitrović, M., & Malone, A. (2011). *Carbon capture and storage (CCS) demonstration projects in Canada*. Energy Procedia, 4, 5685–5691. https://doi.org/10.1016/j.egypro.2011.02.562

economic prospects of carbon management projects. Provinces hold primary responsibility for regulating CCUS activities, as they own their subsurface resources, including the "pore space" for CO2 storage. For example, Alberta, Saskatchewan, and British Columbia have developed regulations to ensure the safe and permanent geological storage of CO2. These provincial regulations cover pore space tenure acquisition, project permitting, long-term liability management, and measurement, monitoring, and verification requirements. Additionally, the Canada Energy Regulator oversees cross-border (interprovincial and international) CO2 transport by pipeline, underscoring Canada's comprehensive approach to CCS.[11]

1.5. Recommendations

The Asia-Pacific region is responsible for over half of global CO2 emissions. While countries like Singapore, Japan, and South Korea have ambitious decarbonization plans, they lack sufficient CO2 storage capacity within their borders. Conversely, other nations in the region possess significant CO2 storage potential but lack the resources to implement large-scale abatement technologies such as CCS.

The government of Indonesia should consider acting swiftly to seize this unique opportunity. By connecting these countries, Indonesia can play a pivotal role in activating and scaling up a cross-border CCS value chain, positioning itself as a key player in regional and global decarbonization efforts. To activate this CCS hub, the following key enablers are required:

1. **Strengthen policy frameworks**. Policy remains a critical factor in the success of CCS initiatives. In addition to establishing enabling regulations, it is vital that policymakers embrace market-based principles to determine commercial terms. Implementing investment protection agreements will further enhance Indonesia's attractiveness to investors and ensure the long-term viability of these investments.
2. **Promote legal certainty for CCS projects**. The government should consider implementing mechanisms to prevent the unilateral revocation of licenses and agreements, ensuring they remain valid unless there is a clear and justified reason. Long-term operational agreements between the government and investors can provide a more secure legal framework.
3. **Foster bilateral government cooperation**. Strong government-to-government dialogue and cooperation are crucial. Bilateral negotiations should include detailed stipulations regarding transfer mechanisms, the value of captured CO2, and other CCS implementation procedures. The recent signing of a Letter of Intent between Singapore and Indonesia marks a significant step toward enabling a cross-border CCS project. Building on this momentum, further collaborative efforts with other nations should be pursued to strengthen the regional CCS value chain.

[11] Natural Resources Canada. (2023). *Capturing the Opportunity: A Carbon Management Strategy for Canada*

4. **Reconsider provisions that hinder the implementation of CB-CCS.** For instance, Article 35 of Perpres No. 14/2024 limits imported CO2 to 30% of total storage capacity. Additionally, Article 47, which stipulates that leakage during CB-CCS operations will not add to Indonesia's NDC, may need revision to facilitate smoother implementation.
5. **Build public support**. Securing public support is indispensable for the success of CCS projects. This requires active stakeholder engagement and raising public awareness about the benefits of CCS, including its potential to drive local decarbonization, create jobs, and generate economic opportunities. Transparent communication and inclusive participation will be key to gaining broad public backing.

2. Mineral Downstream Policy

Key Highlights

- Indonesia's 2009 Mining Law (Law No. 4/2009) mandates the domestic processing of minerals to enhance value addition, economic diversification, and industrial growth. The new administration plans to expand this policy to include 22 additional commodities. However, the efficacy of export bans varies by mineral type, highlighting the need for tailored approaches.
- Indonesia's industrial policy in the mineral sector is fragmented. It primarily focuses on midstream activities by developing smelting and refining facilities for selected minerals but neglects pre-upstream and downstream sectors. From the perspective of the mining industry, many industry players (mineral producers) have fulfilled their obligations mandated by existing laws and regulations. Those companies have built processing and refining facilities to produce midstream products.
- Neglecting the pre-upstream sector runs the risk of reserve depletion. For instance, data from the MEMR's Geological Agency show that high-grade nickel reserves (saprolite) are expected to be depleted in less than 10 years. Meanwhile, lower-grade reserves (limonite) are relatively abundant but require more expensive technology, such as High-Pressure Acid Leaching, for processing.
- Downstream industrial policy should be encouraged so that Indonesia's mineral policy goes beyond smelting and refining. Currently, mineral commodities undergo minimal processing (i.e., refining and smelting) before being exported as semi-processed commodities. A more specific regulation on the development of mineral-based strategic industries is needed.
- There is a need for coordination between MEMR to secure reserves and the Ministry of Industry to foster the mineral industry ecosystem. The latest draft of the presidential regulation on the governance of critical and strategic minerals proposes the creation of a joint secretariat, or an ad-hoc intergovernmental team, to oversee this.

2.1 Overview

Indonesia's resource-based downstream policy has seen a resurgence and has become a pivotal component of the country's current industrial strategy. The 2009 Mining Law exemplifies this shift, introducing stringent regulations that prioritize national ownership and control over mineral resources. This law mandates that foreign shareholders in mining companies divest their shares, allowing Indonesian entities to obtain majority ownership within a decade of commercial production. This policy aims to bolster domestic control over the nation's rich mineral deposits, ensuring that the benefits are more equitably distributed within the national economy.

The 2009 Mining Law also emphasizes local processing industries. By promoting the domestic processing of raw materials, Indonesia seeks to enhance the value added to its mineral resources. This approach aims to increase economic returns, create job opportunities, foster technological advancements, and stimulate industrial growth. As a result, the downstream policy aligns with broader developmental goals, including sustainable economic growth and industrial innovation. This strategic focus is anticipated to remain a cornerstone of Indonesian industrial policy under future administrations, reflecting a sustained commitment to maximizing the economic potential of the country's mineral wealth.

The administration of President Prabowo Subianto envisions expanding the downstream policy to include 22 additional commodities, especially those considered critical minerals, as stipulated in MEMR Decree No. 296K-MB-01-MEM-B/2023. However, the new administration may want to consider the lessons learned from implementing downstream policies for several key commodities. Critics have noted that the efficacy of downstream policies, such as export bans, depends on the specific characteristics of each mineral.[12] For instance, the export ban on nickel is considered effective in promoting the domestic processing industry because Indonesia holds a strong position in the global nickel trade. Conversely, the same policy has been less effective for bauxite, as Indonesia's position in the global bauxite market is not as dominant. Therefore, it is essential to assess the potential impact of downstream policies on each type of commodity individually.

2.2 Key Regulations on Mineral Downstream Policy

In 2009, the Indonesian government signed a new Mining Law that replaced the old Contract of Work (*Kontrak Karya*/CoW) system with mining licenses/permits. This law introduced a ban on exports of unprocessed or insufficiently processed minerals with purity levels below a certain threshold, effective as of January 12, 2014, for companies with CoWs (Article 170). This meant mining companies had to process their products domestically before exporting them.

[12] Desdiani, N.A., Maizar, F.A., & Rezki, J.F. (2023). Larangan Ekspor Mineral Indonesia dan Implikasinya. LPEM FEB UI: Special Report Vol.1 No.2, Juni 2023.

Table 3: List of Regulations on Mineral Downstream Policy

No	Year	Regulation
1	2009	Law No. 4/2009 on Mineral and Coal Mining
2	2010	Government Regulation No. 23/2010 on the Realization of Mineral and Coal Mining Business Activities
3	2012	MEMR Regulation No. 7/2012 on the Increment Added Value of Mineral Through the Activities of Processing and Refining/Smelting Mineral
4	2012	MEMR Regulation No. 12/2012 on the Amendment of MEMR Regulation No. 7/2012 on the Increment Added Value of Mineral Through the Activities of Processing and Refining/Smelting Mineral
5	2014	Government Regulation No. 1/2014 on the Increase of Mineral Value Added Through Domestic Processing & Refining
6	2017	Government Regulation No. 1/2017 on the Fourth Amendment of Government Regulation No. 23/2010 on the Implementation of Mineral and Coal Mining Business Activities
7	2017	MEMR Regulation No. 5/2017 on Minerals' Increased Added Value through Domestic Mineral Processing and Refinery
8	2017	MEMR Regulation No. 15/2017 on the Procedure for the Granting of Production-Operation Specific Mining Business Licenses (Izin Usaha Pertambangan Khusus Operasi Produksi/IUPK OP) as a Continuation of CoW Operation or Coal Mining CoW
9	2017	MEMR Regulation No. 28/2017 on the Amendment of MEMR Regulation No. 5/2017.
10	2019	MEMR Regulation No. 11/2019 on the Amendment of MEMR Regulation No. 25/2018 on the Utilization of Mining Minerals and Coal
11	2020	Law No. 3/2020 on the Amendment of Law No. 4/2009 on Mineral and Coal Mining
12	2023	MEMR Regulation No. 7/2023 on the Continuing Construction of Domestic Mineral Refining Facilities
13	2024	MEMR Regulation No. 6/2024 on the Completion of the Construction of Domestic Mineral Refining Facilities
14	2024	Government Regulation No. 25/2024 on the Revision to Government Regulation No. 96/2021 on the Implementation of Mineral and Coal Mining Activities

2.3 Key Issues on Mineral Downstream Policy

Indonesia's industrial policy to enhance the domestic value added of Indonesian mineral commodities initially focused on five minerals: copper, iron ore and iron sand, nickel, bauxite, and monazite.[13] The government plans to expand this focus to include 22 strategic mineral

[13] Antaranews. (2023). Menperin: Kebijakan hilirisasi logam fokus pada lima komoditas. Antaranews. https://www.antaranews.com/berita/3395964/menperin-kebijakan-hilirisasi-logam-fokus-pada-lima-komoditas

commodities, as outlined in a new MEMR regulation; however, the implementation of the current policy still faces several key issues.

Indonesia's mineral downstream policy concentrates primarily on the midstream segment, which involves processing selected raw minerals into semi-processed commodities, leading to the establishment of smelting facilities. However, the policy has yet to fully consider forward linkages, as its success indicators have been focused on the establishment of smelters rather than the industrial absorption of their products within Indonesia. Additionally, the policy was carried out without sufficient alignment with the National Industrial Master Plan (RIPIN) for broader downstream industries. This means that while raw minerals are processed into semi-finished products, there are limited domestic industries ready to utilize these processed materials further. As a result, the majority of products from smelters are exported rather than refined and used by local industries.

This misalignment has created a bottleneck in the value chain. For example, the new smelting facility in Gresik can process 2 million tonnes of copper concentrates into 600,000 tonnes of copper cathodes. Most of these will be exported, and only 100,000 tonnes will be further processed domestically into copper foil and other derivative products. This highlights the need to develop the downstream industries along the copper supply chain.

Another challenge arises from the incomplete strategy in the upstream segment, which could lead to a risk of depleting reserves of several critical minerals. This could become a significant problem in the future when various smelters face difficulties in securing raw materials. For example, while Indonesia's low-grade nickel ore (limonite) reserves are estimated to last approximately 30 years, the reserve of high-grade nickel ore (saprolite) may be exhausted in less than 10 years.

As the downstream policy, particularly the export bans on raw nickel and copper, has catalyzed the construction of several smelting facilities, the government could now focus on policies and regulations that facilitate deeper forward and backward economic linkages between the mineral processing sector and other parts of the economy, particularly the local downstream industries that benefit from these smelters. Establishing these smelters requires significant capital investment and specialized technical capabilities, and stronger links to downstream sectors would help extend their benefits to small and medium enterprises (SMEs).

Upstream and midstream development has primarily involved larger corporations that have the financial and technical resources needed to manage the high costs and complex technical demands of large-scale smelter construction and operation. Midstream smelting operations, however, tend to generate minimal labor demand, resulting in limited job creation. Consequently, while the policy has stimulated industrial development, it has yet to translate into widespread economic benefits for smaller enterprises and the broader local economy. Industries further downstream, such as the cable industry, have the potential to create more jobs and contribute to higher export values. This underscores the need for more inclusive policies that support SME participation through financial incentives, technical training, and infrastructure support, enabling these smaller entities to contribute meaningfully to the downstream processing sector.

The downstream policy also requires greater focus in terms of the selection of mineral commodities. In an interview with government officials, it was noted that the policy is applied

broadly for all mineral commodities in accordance with the law, which mandates that all minerals must be processed domestically. However, without a comprehensive analysis of the economic feasibility of each mineral commodity, the policy may not fully optimize the benefits to the local economy. This is especially the case without an integrated national industrial strategy that assesses the readiness of downstream sectors to absorb the increased volume of processed minerals within the domestic market.

Furthermore, it would be beneficial for the policy to place a stronger emphasis on energy sustainability, as the processing of raw minerals is a highly energy-intensive activity. With global attention increasingly focused on sustainability, it is important for Indonesia's mineral downstream policy to emphasize the use of clean energy sources to minimize environmental impact. As the government plans to expand downstream processing to 22 strategic minerals (with a focus on five key minerals: copper, gold, tin, nickel, and bauxite), careful consideration of the energy demand this expansion will entail is essential.[14] As the government prepares a presidential regulation on the governance of critical and strategic minerals, ensuring that their processing is aligned with sustainable practices will help mitigate carbon emissions and support climate change goals.

Indonesia may also want to evaluate the industry's current energy consumption patterns, explore renewable energy options, and implement policies that support the transition to cleaner energy sources. The country has significant potential for renewable energy development, including solar, wind, and geothermal resources, which can be leveraged to support the energy needs of the downstream industry. By prioritizing these clean energy sources, Indonesia can fulfill the energy demand of its expanding mineral processing sector and align with global efforts to reduce carbon emissions and promote environmental sustainability.

2.4 Best Practices on Mineral Downstream Policy

2.4.1 United States

The Inflation Reduction Act (IRA), signed into law by US President Joe Biden in August 2022, includes provisions to strengthen the US supply chain for critical minerals. The act offers tax incentives to encourage domestic production of critical minerals such as lithium, nickel, manganese, and graphite, which are essential to producing electric vehicles (EVs) and renewable energy infrastructure. The tax credits are designed to support the development of a robust domestic supply chain for these minerals, which are currently heavily reliant on imports from countries like China and Russia.

The IRA's EV tax credits come with a caveat: They only apply if the materials used to construct the vehicle come from the United States or countries with which the US has a free trade agreement. This provision is intended to promote domestic manufacturing and reduce the country's dependence on foreign supplies of critical minerals. Additionally, the act includes provisions for the "enhanced use" of the Defense Production Act to strengthen the US supply

[14] The list of 22 strategic minerals is provided in the MEMR Regulation (Kepmen) No. 69.K/MB.01/MEM.B/2024, while the list of 47 critical minerals is provided in the MEMR Regulation (Kepmen) No. 296K/MB.01/MEM.B/2023.

chain for critical minerals. This includes up to USD 500 million in funding to support the development of new mines and the expansion of existing ones.

The IRA's focus on downstream beneficiation is part of a broader effort to promote domestic manufacturing and reduce reliance on foreign supplies. By incentivizing domestic production of critical minerals, the act aims to support the growth of the US manufacturing sector and contribute to the country's energy security. The success of these policies will depend on various factors, including the ability of the US to ramp up domestic production and the effectiveness of the tax incentives in attracting investment in the sector.

2.4.2 Canada

In response to the increasing global demand for critical minerals, the government of Canada introduced the Canada Critical Mineral Strategy in 2022. One of the primary objectives of this strategy is to develop domestic value-added capabilities within the critical mineral downstream industry. This initiative aims to enhance the processing, manufacturing, and recycling capacities of critical minerals within Canada, thereby reducing reliance on foreign supply chains and bolstering the nation's economic resilience. The strategy underscores the importance of creating a sustainable and robust critical mineral sector to support the burgeoning demand for green technologies and advanced manufacturing.

To achieve these goals, Canada has implemented several key tools and funding mechanisms. The Zero-Emission Vehicle Infrastructure Program (ZEVIP) offers substantial funding for projects focused on deploying EV chargers, a critical component of the broader strategy to promote the adoption of zero-emission vehicles. Furthermore, the Strategic Innovation Fund (SIF) allocates USD 1.5 billion for critical mineral projects. This funding is directed toward advanced manufacturing, processing, and recycling applications to foster innovation and technological advancements within the sector. These measures are designed to ensure that Canada remains competitive in the global critical minerals market while supporting environmental sustainability and economic growth.

2.5 Recommendations

As the government of Indonesia prepares to expand its downstream policies to other commodities, the following recommendations can enhance the effectiveness of these policies:

1. **Develop a comprehensive roadmap for each commodity's downstream readiness**. Before implementing a downstream policy, a roadmap outlining each commodity's readiness and available reserves should be developed. Each roadmap should consider the economic feasibility of a commodity for downstreaming, factors that may disrupt processing and production, and the underlying market forces (i.e. supply and demand) for each commodity.
2. **Strengthen pre-upstream industries**. Emphasizing the exploration phase is crucial to ensure long-term reserve availability. A robust exploration strategy is essential for securing the raw materials needed for sustainable downstream development. This requires a comprehensive regulatory framework that includes incentives to encourage

exploration, regulations to ensure a stable supply, and measures to reduce regulatory obstacles.

3. **Expand downstream industries**. Priority should be given to developing downstream sectors, especially for minerals already being processed domestically, such as nickel, bauxite, and copper. The goal should be to add value beyond smelting and refining, moving toward manufacturing semi-processed and finished products. This ensures that downstream industries can absorb products produced by upstream sectors. Furthermore, the importance of industrial policy should be clearly reflected in the National Industrial Master Plan (RIPIN). This policy should account for global market supply and demand, not just the domestic market, to ensure the downstream industries are competitive and aligned with international market needs.
4. **Boost regulatory and supervision alignment among relevant ministries**. Companies must comply not only with mining regulations but also with environmental, industrial, and other sector-specific regulations. Therefore, it is essential that regulations concerning waste management, tailings, CO2 emissions, and other similar issues are integrated into a unified regulatory framework. For example, tailings are still classified as hazardous materials, which prevents their use in downstream processing. Moreover, while the Ministry of Industry issues downstream business permits, other permits related to licensing, supervision (such as work safety), and environmental compliance are issued by the MEMR. A well-coordinated approach among these ministries is crucial to ensure consistent and effective regulatory oversight.
5. **Regularly evaluate the downstream policy.** As the downstream policy will be one of the key strategies for boosting Indonesia's economy under the new government, it is important to regularly evaluate whether the policy is achieving its objectives. Continuous assessment will help refine the policy and ensure its long-term success.
6. **Provide legal certainty for long-term investment**. Securing long-term mineral supply for the downstream industry requires substantial investment. Therefore legal certainty for long-term mining investment is crucial. In this regard, a mining business permit could be granted to companies based on the life of the mineral reserves.
7. **Integration with CCS Infrastructure**. Establishing CCS infrastructure will significantly benefit Indonesia's mineral downstream policies by offering a viable solution for decarbonization. This will make the country more attractive to global investors, who are increasingly seeking opportunities in regions with abundant raw materials and the capability to process them with minimal emissions.

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Chapter II

Film Entertainment Sector

1. Overview of the Sector

Key Highlights

- The creative economy in Indonesia, profoundly affected by the COVID-19 pandemic, is poised for dynamic growth in the coming years, with audiovisual content leading the charge. This trend, driven by the increasing engagement of young people in creating diverse video content and the rising popularity of local films and series on Online Curated Content (OCC) platforms, underscores the importance of audiovisual media in shaping the future of the creative sector. Cinema admissions in 2023 already exceeded the pre-pandemic level with 55 million tickets sold, while the 136 titles produced that year were comparable to the pre-pandemic figure.
- The COVID-19 pandemic brought the growth of the Indonesian cinema industry to a standstill. Cinema admissions plummeted from 51.2 million in 2019 to just 4.5 million in 2021. The industry also managed to produce only 36 and 47 titles in 2021 and 2022, respectively.
- The Indonesian film entertainment industry faces several key challenges, including a shortage of skilled workers in both above-the-line and below-the-line roles, limited infrastructure such as post-production facilities and broadband internet—critical for accessing content on various streaming platforms—a lack of competitive movie production incentives compared to neighboring countries, and inefficient regulations and enforcement that hinder movie production.
- The Indonesian government has significant opportunities to boost the film industry by developing skilled workers and enhancing infrastructure, drawing inspiration from successful international models. Countries like Australia, Thailand, Singapore, and South Korea have implemented effective incentive programs that center around cash rebates, which Indonesia can emulate to attract international productions and foster industry growth.
- To support the development of the Indonesian film entertainment industry, it is recommended that the government design and implement a clear strategy to develop skilled workers, increase investment in essential infrastructure such as cinemas and internet broadband, accelerate the creation of incentives for movie production, and review inefficient regulations and their enforcement.

1.1 The Film Entertainment Industry in Indonesia

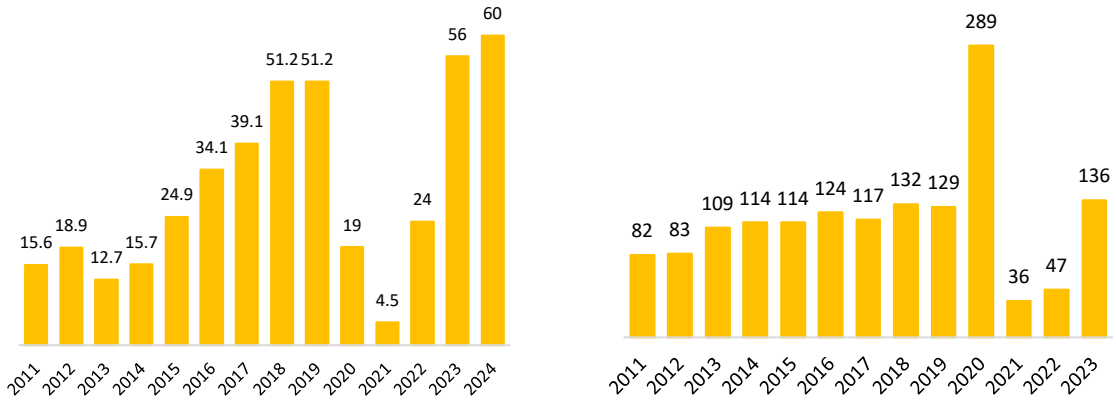
The contribution of the screen industry to the Indonesian economy is projected to increase in the coming years. In 2022, the Indonesian screen industry generated around USD 8.2 billion (IDR 131.2 trillion) for the national economy, which is equivalent to around USD 5.1 billion in GDP and 387,000 jobs (LPEM FEB UI, 2023). By 2027, the industry's economic impact is projected to reach USD 9.8 billion. That figure could translate to around USD 6.1 billion in additional contributions to the Indonesian GDP and the creation of around 616,000 full-time equivalent jobs. In other words, every dollar of new investment in the screen industry

generated USD 1.43 of economic output, translating to USD 0.89 dollars of GDP along the supply chain.[15]

The Indonesian screen industry—which includes the film and TV sectors—holds significant potential on both the demand and supply sides. On the demand side, Indonesia possesses a vast and largely untapped domestic market, characterized by a growing middle class and limited content distribution channels, especially in terms of the number of theatrical screens. Meanwhile, on the supply side, the movie production industry is beginning to awaken from its long dormancy, evidenced by a noticeable increase in movie titles released over the past several years.

Figure 1. Number of Cinema Admissions and Films Produced in Indonesia

(a) Cinema Admissions (b) Films Produced



Source: Author's compilation[16]

The number of cinema admissions tripled between 2011 and 2019 before the pandemic halted this significant growth, but the current level of admissions has now exceeded pre-pandemic levels (Indonesian Film Board, 2019). The number of moviegoers grew from 15.6 million people in 2011 to 51.2 million people in 2019. After pandemic-related restrictions were lifted, ticket sales rebounded to 24.0 million in 2022 and are on track to reach 60 million in 2024.

Similarly, people are increasingly consuming video content, including films and TV series, through online streaming platforms. This emerging media has provided a new channel of distribution for movie producers to tap into, leading to a growth in Online Curated Content (OCC) platforms such as Vidio and Netflix. Since 2016, OCC service revenues have grown to USD 100 million and are projected to reach USD 500 million by 2025, where 75% of internet users in Indonesia engage with OCC services at least once a week, dedicating 50% of their

[15] 1 USD = 16,000 IDR

[16] 2011-2017: BPI and Bekraf's the Indonesian Film Industry: Unlocked Potentials
2018-2022: BPI (2023). https://www.bpi.or.id/artikel-27-Wajah_Perfilman_Nasional_di_hari_film_nasional.html
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2024: Kompas (2024). https://www.kompas.id/baca/ekonomi/2024/02/06/triliunan-rupiah-prediksi-perputaran-ekonomi-industri-perfilman-indonesia-pascapandemi

time to watching local productions, which remains one of the most preferred contents by Indonesians (Frontier Economics, 2021; Populix, 2022).[17]

Indonesian content and creators have made significant strides on the global stage, capturing international audiences, especially in ASEAN countries (Malaysia, Singapore, and Vietnam) and other parts of Asia, such as Azerbaijan and Turkey (Pusparisa, 2024). Top-performing titles such as *Cigarette Girl* on Netflix offer unique storytelling styles that capture the country's rich and diverse culture. In fact, *Cigarette Girl* co-directors Kamila Andini and Ifa Isfansyah won the best director award at the Busan International Film Festival 2024.

On the production side, the number of movies produced in Indonesia grew steadily from 82 titles in 2011 to 129 titles in 2019 (Indonesian Film Board, 2019). During the first year of the pandemic, the number of Indonesian movies produced jumped to 289 titles. However, as the pandemic worsened, so did movie production in Indonesia; only 36 titles were released in 2021 and 47 titles in 2022. The industry quickly rebounded, however, producing 136 titles in 2023.

Moreover, the screen industry has demonstrated its capacity to stimulate economic activity across various sectors, particularly through spillover effects into tourism. This impact is evident in Indonesia, with the release of *Laskar Pelangi* in 2008 leading to a 20% increase in hotel occupancy on Belitung Island between 2007 and 2009 (LPEM FEB UI, 2023). Similarly, *Ngeri Ngeri Sedap*, released in 2022, showcased iconic sights in North Sumatra and Lake Toba and is believed to have significantly boosted tourism in 2023, mirroring the influence of *Laskar Pelangi* (LPEM FEB UI, 2023).

2. Challenges

The Indonesian film entertainment industry has significant potential to boost the economy, but it faces a number of challenges ranging from a shortage of skilled workers to regulatory obstacles that complicate its development. Addressing these issues is crucial, and it is imperative for the Indonesian government to take proactive measures to overcome these barriers and unlock the full potential of the film entertainment industry.

2.1 The Need for Skilled Workers

The Indonesian screen industry is grappling with a pressing need for a more skilled workforce, both for above-the-line (ATL) positions, or those responsible for the creative development, production, and direction of a film or TV show, and below-the-line (BTL) jobs, which include the crew members and other technical roles. According to data from the Ministry of Tourism and Creative Economy (MoTCE), the Film, Animation, and Video subsector employed 92,743 workers in 2022, representing less than one percent of the total workforce in the creative economy. This talent scarcity makes it difficult for local movie producers to find suitable film crews and actors (Dewabrata, 2024). As a result, producers often compete with one another to recruit these essential personnel.

[17] 1 USD = 16,000 IDR

This workforce gap significantly hinders the industry's development. In the earliest stages of production, one of the main challenges identified is the lack of scriptwriters, which hampers the development of quality movie scripts (Anas et al., n.d.). During the production phase, there is a persistent shortage of film crew members with specific technical skills, such as cinematographers, and a shortage of skilled actors. Furthermore, there is a notable lack of non-standardized skilled workers, such as directors, which exacerbates the difficulties faced by movie producers. Aside from roles directly involved in the production process, there is also a shortage of non-production roles, such as movie accountants and intellectual property lawyers, which are crucial for supporting the movie industry.

On the supply side, educational institutions in Indonesia are struggling to keep up with the demands of the industry. Although there are university-level programs in film production, they often fall short for three key reasons: there aren't enough programs available, the curricula are frequently outdated and lack relevance to current industry needs, and they do not offer sufficient specialization. Indonesian director Joko Anwar pointed out that there are very few film schools in the country, forcing many filmmakers and crews to learn on the job.[18] Edwin Nazir, chairman of the Association of Indonesian Film Producers, echoed this sentiment, stating that new talent is developing at a slower pace than the growing demand. The disparity between the rate of talent development and industry growth presents a major challenge for Indonesia's creative sector. Without adequate specialized programs and up-to-date curricula, the country faces difficulties in producing the skilled professionals needed to meet the increasing demand, underscoring the urgent need for greater investment in education and training to support the continued growth and global competitiveness of the creative industries.

Beyond production, the industry faces a shortage of dedicated distributors, forcing local producers to take on promotional and distribution responsibilities. Ideally, these roles should be managed by specialized entities, enabling producers to concentrate on the creative process. Addressing these workforce needs is crucial for the growth and advancement of the Indonesian film industry.

2.2 Limited Infrastructure

Indonesian movie producers face significant challenges due to insufficient infrastructure and rising production costs. Essential facilities such as studios, post-production labs, and cloud-based tools for visual work are in short supply (LPEM FEB UI, 2023). As a result, local producers frequently carry out post-production processes, including coloring and sound mixing, in other countries like Hong Kong and Thailand (Anas et al., n.d.).

Infrastructure limitations also affect the distribution segment of the screen industry, posing challenges to making films accessible to the public. Despite Indonesia having a population exceeding 270 million and a growing middle class, the country's potential for a robust screen industry remains largely untapped. With only around 500 cinemas and approximately 2,300 screens nationwide, Indonesia is significantly under-screened. For a country of Indonesia's size, the ideal number of cinema screens should be closer to 10,000. Moreover, these cinemas

[18] Guild, J. (2020, November 25). When Will Indonesia's Film Industry Recover? *New Mandala*. Retrieved September 24, 2024, from https://www.newmandala.org/when-will-indonesias-film-industry-recover/

are mostly concentrated in major cities, creating a stark imbalance in movie access for large segments of the population.

2.3 Lack of Incentives for Movie Production

Production incentives, workforce capacity, infrastructure, and a film-friendly environment are crucial for developing a competitive screen production sector (Olsberg SPI, 2024). However, aside from these, Indonesia falls short compared to its regional peers, such as Thailand, Malaysia, and Singapore, in offering key incentives like cash rebates, which are essential for attracting both international and domestic productions.

These incentives offer substantial benefits to both producers and governments. For producers, they help reduce production costs, making it more feasible to finance films. For governments, they stimulate significant economic benefits, including job creation, infrastructure development, and the promotion of soft power and screen tourism. Typically, the incentive rate is 20% of eligible expenditure, depending on the country.

A comprehensive incentive package often includes various tax-related benefits, such as tax holidays for actors, actresses, and production companies, along with tax credits, relief, and shelters. These financial advantages are crucial for production companies seeking the most favorable economic conditions.

However, Indonesia's regulatory framework does not allow the implementation of incentives such as cash rebates. This limits government support to traditional subsidies, which are less effective for the specific needs of the film industry. Additionally, while tax holidays are available in other sectors, they have not yet been extended to film production, leaving a critical gap in Indonesia's incentive offerings.

The MoTCE is currently in discussions with the Ministry of Finance about implementing cash rebates for film production in Indonesia. This move would align Indonesia with its regional competitors and address the current disadvantages in the global film production market. Cash rebates are widely considered the most efficient incentive, particularly for large-scale productions, as they provide direct financial returns after the project is completed (Kearney, 2022).

Without a comprehensive and competitive incentive system, Indonesia's ability to attract international film productions and grow its domestic industry is significantly weakened. To compete effectively with regional peers, Indonesia must urgently reassess its regulatory framework and adopt a more inclusive set of incentives, such as cash rebates and tax-related benefits, to position itself as a leading film production destination in the Asia-Pacific region.

2.4 Inefficient Regulations and Enforcement

Regulatory challenges pose significant obstacles to the growth of the Indonesian screen industry. One of the primary concerns is the ineffective implementation of Government Regulation No. 24/2022, which outlines the use of IP as collateral for loans. This scheme is still not widely adopted or practical for most creative economy players. Although the regulation allows for IP-based financing, there are challenges in its implementation. Many financial

institutions remain cautious about accepting IP as collateral due to difficulties in assessing its true value. The process of verifying and valuing IP is complex, and there are limited examples of successful use cases within the industry.

On the other hand, Indonesia's copyright law is in need of updating, and its weak enforcement undermines IP protection and diminishes the incentives for creative production. These regulatory shortcomings create an environment where the rights of content creators are not adequately safeguarded, leading to economic and reputational issues for the industry.

The inadequate enforcement of copyright regulations directly contributes to the proliferation of piracy within the sector. When copyrighted materials are easily duplicated and distributed without authorization, content creators and production companies suffer substantial financial losses. The economic loss from online piracy is estimated to reach USD 290,000 per film (LPEM FEB UI, 2023).[19] This illegal distribution not only reduces potential revenue streams but also discourages investment in high-quality productions, as the return on investment becomes increasingly uncertain. Over time, persistent piracy can erode the overall quality and competitiveness of the industry on both domestic and international stages. Stricter enforcement of Indonesia's Law No. 28/2014 on Copyright is needed to ensure the long-term growth of the Indonesian screen industry.

Revising Law No. 33/2009 on Films is crucial to providing a tangible roadmap for supporting the film industry ecosystem in Indonesia. The current law, while foundational, needs to be updated to address the evolving challenges and opportunities within the industry. A revised Film Law would offer clear guidelines and support mechanisms that could significantly enhance the development of skilled workers, the expansion of film infrastructure, and the provision of incentives for film production. By establishing a more robust legal framework, the government can ensure that the necessary resources, training programs, and infrastructure investments are in place to meet the growing demands of the industry.

Updating the Film Law would also strengthen the narrative around the importance of developing a skilled workforce, which is essential for elevating the quality and competitiveness of Indonesian films on the global stage. It would create a formal structure for capacity-building initiatives, ensuring that educational institutions, industry associations, and the private sector work together to provide comprehensive training and development opportunities. Additionally, the law could include provisions for modernizing film infrastructure, making it more accessible and conducive to high-quality production, and establishing competitive incentives that attract both domestic and international productions. Such revisions are necessary to create a thriving, sustainable film industry that can contribute significantly to Indonesia's cultural and economic growth.

Another significant issue is the bureaucratic inefficiencies caused by overlapping scopes and responsibilities between national and regional authorities. This ambiguity creates additional challenges for the screen industry's productivity and efficiency. The process of obtaining necessary permits for filming, accessing specific locations, and importing essential equipment and skilled production personnel is often encumbered by excessive paperwork and procedural delays. These administrative hurdles can lead to increased operational costs and project

[19] 1 USD = 16,000 IDR

timelines, making it more difficult for producers to manage budgets effectively and meet critical deadlines.

The complexity and unpredictability of bureaucratic processes can also deter international collaborations and investments. When production companies face uncertain timelines and cumbersome regulations, they may opt to relocate projects to more facilitative environments where administrative procedures are streamlined and support for the industry is more robust. This relocation results in missed opportunities for local talent development, job creation, and economic contributions that such projects could have brought to the region.

From Local Gems to Global Hits: Unlocking Indonesia's Cinematic Potential

When the prestigious *Variety* magazine asked acclaimed Indonesian filmmakers Kamila Andini and Ifa Isfansyah about the evolving landscape of the Indonesian film industry, their excitement was palpable.[20] They were discussing the impact of streaming platforms on local content, particularly in the context of their upcoming film, *Cigarette Girl*, which was about to debut on Netflix on November 1, 2023.

Andini noted the shifts she observed: "Shows other than feature films have emerged. Different story languages are emerging. Audiences are increasingly being put first. There's an increasing emphasis on quality, from story to cinematography." Isfansyah added, "Streaming has opened more possibilities for production."

Their anticipation was well-founded. *Cigarette Girl*, a five-episode epic tale about love and tradition against the backdrop of a changing nation, went on to spend two weeks in Netflix's Global Top 10, ranking in the Top 10 in nine countries and amassing a staggering 29 million hours viewed in 2023. This level of global engagement underscores the strong demand for authentic Indonesian stories, proving that the country's narratives can indeed resonate far beyond its borders.

But *Cigarette Girl* is not an outlier. In fact, it's part of a growing trend of Indonesian films gaining international acclaim. Take the 2022 action-comedy *The Big 4*, for instance. Released on Netflix in December 2022, the film spent three weeks in Netflix's Global Top 10 and was among the Top 10 in 65 countries. Similarly, *Nightmares and Daydreams*, a sci-fi horror anthology by the renowned director Joko Anwar, captivated audiences across 17 countries, spending two weeks in Netflix's Global Top 10 after its release in June 2024.

The success of these shows on global platforms highlights the potential of Indonesia's creative industry to extend its influence worldwide. But it's not just streaming services where Indonesian stories thrive. In domestic theaters, local films dominate, accounting for 60-70% of box office revenue. This robust local support signals a strong foundation that, if properly nurtured, could be leveraged for even greater global reach.

[20] Frater, P. (2023, October 18). *As 'Cigarette Girl' Drops Trailer, Kamila Andini Talks Female Empowerment, Indonesia's Troublesome History: 'We Are Not Good at Seeing Things Face On' (EXCLUSIVE)*. Variety. https://variety.com/2023/tv/news/cigarette-girl-kamila-andini-ifa-isfansyah-indonesia-history-story-1235761593/

Consider *Agak Laen*, a 2024 Indonesian comedy that premiered in theaters before making its way to Netflix in May. The film remained in Indonesia's Top 10 for 11 weeks and even reached the Top 10 in three other countries.

All these examples demonstrate a strong appetite for Indonesian content, affirming the industry's potential as a significant source of soft power for Indonesia.

The impact of Indonesian content is not limited to entertainment alone; it can even stimulate economic growth and bolster local industries. In the small town of Muntilan, the popularity of *Cigarette Girl* led to a 50% increase in sales for a local snack shop, Nyonya Pang, that was featured in the original book on which the series is based, according to a local media report.[21] It's a clear example of how film and television can serve as powerful tools for cultural diplomacy.

However, to fully harness this potential, Indonesia's creative industry needs more than just creative talent—it needs systemic support.

Ruben Hattari, the public policy director for Netflix in Southeast Asia, emphasizes this point: "Improving ease of doing business in the field is key. That includes easing access to permits, ensuring there are no overlapping regulations, and providing government support to facilitate investments, whether through financial incentives or other means."

In addition to regulatory improvements, there is a critical need to invest in high-quality education and vocational training programs to develop the skills necessary for growing and elevating the entire industry. This is an area where the private sector can partner with the government.

"Being embedded in the local ecosystem, Netflix has been able to identify skills gaps — from writing to production and post-production — and create workshops that bring in global best practices to address these," Ruben explains.

These include a partnership with the Ministry of Education, Culture, Research, and Technology for a scriptwriting, narrative development and character-building workshop for films. Netflix has also collaborated with the Jogja-Netpac Asian Film Festival for a training program designed to provide aspiring filmmakers with insights, skills, and networking opportunities. Leveraging its global network, Netflix also brings in some of the top talents in the world, such as *Squid Game* and *Stranger Things* writer Joe Peracchio, to train Indonesian creators on scriptwriting techniques.

By streamlining regulations, offering incentives, and building capacity, the government can help create an ecosystem that encourages investment and innovation. With the right backing, Indonesian content could not only continue to entertain but also act as a bridge between cultures, showcasing the country's stories to the world and turning it into a global cultural powerhouse.

[21] Susanto, E. (2023, December 9). *Berkah Film Gadis Kretek, Penjualan Nyonya Pang Muntilan Meningkat 50 Persen*. Detikjateng. https://www.detik.com/jateng/wisata/d-7080551/berkah-film-gadis-kretek-penjualan-nyonya-pang-muntilan-meningkat-50-persen

3. Opportunities for the Indonesian Government

3.1 Supporting Skilled Workers' Development and Infrastructure Improvement

Supporting the development of skilled workers and improving infrastructure in the film entertainment industry are increasingly urgent as global competition intensifies and the demand for high-quality productions grows. A well-trained workforce and robust infrastructure are critical to sustaining industry growth, fostering innovation, and attracting international projects. Without targeted investments in these areas, the industry risks falling behind, missing out on economic opportunities, and failing to meet the evolving demands of both domestic and global markets.

Australia offers exemplary examples in these areas, as demonstrated by Screen Australia's recent initiatives. The BTL Next Step program supports mid-career practitioners in advancing their careers by providing paid placements with mentorship and credits in critical crew and leadership roles, such as line producer and post-production supervisor positions. The Production Crew Skills Training Fund offers grants to production companies, enabling them to provide structured, work-based learning and training to at least three participants, focusing on emerging practitioners and crew upskilling. Additionally, the Transferable Skills & Returning Crew Training Fund allocates grants to organizations and businesses for initiatives that assist BTL practitioners returning after a career break or individuals transitioning from other industries by identifying and connecting transferable skills to BTL roles (Screen Australia, 2023). These programs collectively strengthen the screen industry by ensuring a steady pipeline of skilled workers and enhancing overall production capacity.

3.2 Investing in Digital Infrastructure

To overcome Indonesia's infrastructure limitations, the government may also want to consider investing more in expanding the country's internet broadband network. This investment is crucial to ensure that the underserved population, especially in rural and remote areas, has access to films and other creative economy products available on OCC platforms.

With the growing reliance on digital platforms for content consumption, expanding broadband access will help bridge the gap between urban and rural areas, ensuring that more Indonesians can enjoy the benefits of the creative economy.[22] This will reduce the reliance on physical infrastructure, such as cinemas, and allow the Indonesian screen industry to reach a broader audience.

[22] Husna and Budiman. (2023). Connecting the Unconnected: Lessons for Enhancing Fast and Reliable Internet from Southwest Sumba District. CIPS Policy Paper No. 61.

3.3 Offering Competitive Production Incentives: Taking Lessons from Neighboring Countries

Thailand

Thailand's movie production incentives aim to boost tourism and use local resources and labor, thereby stimulating the economy (LPEM FEB UI, 2023). The key incentive is a cash rebate program run by the Thailand Film Office under the Department of Tourism.

Filmmakers who spend at least THB 50 million (IDR 21.9 billion) on production in Thailand can receive a maximum of THB 150 million in rebates per film. The incentive structure offers a 20% base rebate plus bonuses of 2% to 5% for carrying out post-production work done in Thailand, hiring Thai personnel, filming in select locations, or promoting Thailand's image, soft power, and tourism (Thailand Film Incentive Measures, 2024).

Singapore

The Singapore Tourism Board launched the Film in Singapore! Scheme (FSS) in 2004 to attract international filmmakers to shoot and produce content in Singapore, covering up to 50% of eligible expenses. This initiative aims to elevate Singapore's profile as a global destination through media exposure, with the Tourism Board also assisting with logistics and permit processing. In 2023, the Singapore On-screen Fund, a collaboration between the Infocomm Media Development Authority and the Tourism Board, was launched to support international media projects that highlight Singapore as a travel destination, offering up to 30% funding for eligible production and promotional costs. These initiatives foster partnerships between local and global media enterprises to create content appealing to international audiences.

Malaysia

The Film in Malaysia Incentive (FIMI) offers a 30% cash rebate on eligible expenditures for both local and international producers (LPEM FEB UI, 2023). To qualify, foreign producers must either film in Malaysia or engage in a co-production with a Malaysian producer. Additionally, the project must have a minimum production budget, including post-production, of MYR 5 million (approximately IDR 17 billion). Local producers must meet the same budget requirements, obtain a film production license from the National Film Development Corporation Malaysia (FINAS), and ensure the film’s domestic and international distribution and screening (FIMO, 2024).

South Korea

The Korean Film Council offers up to 25% support for expenditures incurred in Korea for international co-productions, including feature films and documentaries, that meet certain legal criteria. This support is available to foreign-produced films, series, and documentaries if more than 80% of the production costs are covered by foreign capital. In terms of co-production films, to qualify for this incentive, a project must allocate at least 20% of the budget across two countries or 10% across three, complete shooting within a year, and meet specific spending thresholds. Projects that spend over KRW 800 million (about IDR 9.4 billion) and film

for more than 10 days in Korea are eligible for a 25% rebate, while those spending between KRW 100 million and 800 million with at least five days of filming qualify for a 20% rebate. Each project can receive up to KRW 300 million, subject to an evaluation of its use of Korean resources, potential for global success, and artistic merit.

Australia

Ausfilm, a collaboration between the private sector and the government, promotes Australia's Screen Production Incentive program, which includes three key incentives. First, the Location Offset offers a 30% rebate on Qualifying Australian Production Expenditure (QAPE) to attract large-budget productions to Australia, and it can be combined with additional state and local incentives. Second, the PDV Offset provides a 30% rebate on QAPE for post-production, digital, and visual effects (PDV) work, applicable regardless of shooting location, and can be supplemented by up to 15% from state incentives. Third, the Producer Offset offers a 40% rebate for feature films and 30% for television content. These incentives are administered by the Office for the Arts and Screen Australia, which also supports industry development through various training initiatives.

Table 1: Comparison of Production Incentives

Country	Type	Value	Additional Value	Per Project Cap	Annual Budget/ Cap
Thailand	Rebate	20%	5% for productions that enhance Thailand's cultural identity or "soft power." 3% for productions filmed in government-designated areas for economic development. 3% for productions that employ Thai nationals in key positions. 2% for productions that both film and conduct post-production in Thailand. 5% for productions with qualified local expenditures exceeding THB 150 million (Rp 66.6 billion), starting from January 1, 2024.[23]	THB 150 M	N/A
Singapore	Rebate	30%	-	-	SGD 10 M[24]
Malaysia	Rebate	30%	A 5% increase based on meeting cultural test criteria.	-	-
South Korea	Rebate	20%	A 5% bonus for productions that film for over 10 days in South Korea and spend more than KRW 800 million (around IDR 9.4 billion)[25] locally.	KRW 300 M	KRW 1,024 M
Australia (Location Offset)	Tax Credit	30%	Can be combined with state and territory incentives and grants.	-	-
Australia (PDV Offset)	Tax Credit	30%	Can be combined with up to 15% from state and territory government incentives.	-	-
Australia (Production Offset)	Tax Credit	40% (theatrical features); 30% (non-theatrical features)	Can be combined with state and territory incentives and grants.	-	-

Source: Olsberg SPI (2024)

[23] 1 THB = 444.21 IDR (2024 average)
[24] 1 SGD = 11,872 IDR (2024 average)
[25] 1 KRW = 11.75 IDR (2024 average)

4. Recommendations

This study offers several recommendations for the government of Indonesia to foster the development of the film entertainment industry:

1. Implement a clear strategy to build the capacity of skilled workers.

Developing comprehensive training programs and fostering partnerships with stakeholders can help address the shortage of professionals in various technical and creative roles, particularly in high-demand positions such as screenwriters, producers, and directors. The Indonesian government could collaborate with domestic screen industry associations, international film institutions, and the private sector to develop and provide capacity-building initiatives aimed at alleviating the country's skilled worker shortage in the screen industry.

In terms of formal training and education, the Indonesian government needs to know where the gaps and shortages are so that capacity development can be aligned with the exact workforce and skills needed. Graduates can then be better equipped with the specialized skills required for creative and technical roles. Furthermore, expanding educational opportunities in film and media can equip aspiring professionals with the essential skills and knowledge needed to improve the overall quality of local productions and foster innovation within the industry. In addition to a more relevant curriculum, this can be achieved through on-the-job training programs, which will also enhance students' portfolios. Moreover, screen production is continually evolving with the development of new technologies and workflows, resulting in shifting skill requirements. As a result, it is crucial to foster a workforce that is both flexible and adaptable to these changes.

The government could also intensify efforts to raise awareness about the wide range of career opportunities in the digital creative industry, from technical positions like visual effects specialists and animators to creative roles like screenwriters and game designers. Promoting these options can help attract a more diverse talent pool and ensure long-term growth in the Indonesian screen industry.

The development of a skilled workforce in the screen industry should not be the sole responsibility of the Ministry of Culture, Ministry of Tourism and the Ministry of Creative Economy. The Ministry of Manpower and the Ministry of Youth and Sports should also be involved in creating programs to support these initiatives.

2. Accelerate investment in infrastructure to support the creative economy.

Attracting significant investment in film-related infrastructure will help boost the development of the industry. Key areas for investment include expanding the number of cinemas, increasing the availability of post-production facilities, and enhancing internet broadband. The widespread availability of cinemas across the country is essential for effective movie distribution, ensuring that films reach a broader audience. Additionally, increasing the number of post-production facilities is crucial for creating a robust film industry ecosystem, enabling local filmmakers to produce high-quality content without relying on facilities abroad.

Further investments should focus on identifying potential sites for new studios and production developments, which can house state-of-the-art studios and soundstages for a wide range of productions, from small indie films to large-scale blockbusters. Moreover, not all infrastructure needs to be permanent. Pop-up production spaces such as converted warehouses or purpose-built locations can attract production without requiring significant upfront investments. Establishing a location library and a comprehensive database of film sites across the country would further enhance the ease of planning and executing film projects, showcasing Indonesia's diverse landscapes to filmmakers worldwide.

3. **Expedite the design and implementation of movie production incentives comparable to those of peers.**

Implementing competitive incentives will help attract local and foreign filmmakers, encourage higher-quality productions, and stimulate the industry's growth. In general, production incentives should be straightforward, predictable, and transparent, with a seamless and efficient application process. Authorities should set high service standards to ensure quick, clear, and reliable turnaround times for all applications.

For foreign filmmakers, Indonesia could design a comprehensive incentive program with substantial cash rebates. For instance, foreign producers who invest a minimum amount in local film production could be given a cash rebate of up to 30% on eligible expenditures. Additional incentives could be offered for employing Indonesian crew, conducting post-production work in Indonesia, and showcasing locations outside major cities to promote local culture. Furthermore, scaling the rebate amount based on the production budget and duration of the shoot in Indonesia would encourage longer stays and higher spending, thereby also boosting the tourism sector.

For local filmmakers, the incentive program should focus on reducing production costs. Local filmmakers could be given up to 35% in cash rebates on their production expenses, with higher percentages available for projects that demonstrate significant cultural or economic impact. Additionally, incentives could be increased for productions that successfully bring Indonesian films to international audiences, further elevating the country's cinematic presence on the global stage. Reforming Indonesia's *Produksi Film Negara* (PFN) to focus on developing a financing scheme, especially for local production houses, is also key to supporting the domestic screen industry.

However, enhancing Indonesia's competitive edge in the global film industry requires the introduction of production incentive schemes beyond just cash rebates. A practical and impactful approach would be to implement a Location Scouting Support program. This program could cover the costs for directors, assistant directors, producers, cinematographers, production designers, or location managers of international projects planning to film in Indonesia. Such an initiative would not only attract more international productions but also amplify the positive spillover effects to the tourism sector, which has already proven to be significantly impacted by the screen industry in Indonesia.

4. Streamline the regulation and permit application process.

The permit application process should be streamlined by centralizing the authority responsible for issuing them. Combining permits from central and regional governments can simplify coordination for filmmakers and expedite the process. An efficient and effective permit system will also help filmmakers transition quickly between production stages. Overall, streamlining will improve the ease of doing business in the screen industry's ecosystem.

In addition, it is crucial to improve coordination between relevant institutions. The government can develop effective programs for the movie industry by aligning the interests and objectives of each institution. In Indonesia, the Ministry of Culture, the Ministry of Tourism and the Ministry of Creative Economy manage the film industry. Establishing clear leadership within these ministries is essential to providing clarity and guidance to filmmakers.

5. **Establish a film-friendly environment.**

It is essential for production to take place in a film-friendly environment, which encompasses operations, travel accessibility, and communications. A film-friendly environment is typically overseen by a film commission, which maintains and manages partnerships. This commission can help create a network of verified film-friendly partners to streamline production, permit applications, and other requirements.

Most productions also involve international labor, talent, and film equipment. Therefore, facilitating their movement from one point to another will greatly ease the process.

Failing to take advantage of the opportunities in Indonesia's film and screen industry would result in the country missing out on significant potential benefits, such as job creation, increased tourism, and greater cultural influence. Conversely, successfully expanding this sector—which encompasses numerous subsectors that employ a large workforce—could position Indonesia as a key player in the global film industry, fueling substantial economic growth, generating positive spillover effects, and fostering cultural exchange.

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Chapter III

Food and Agriculture Sector

1. Overview of the Sector

Key Highlights

- Indonesia's agriculture sector is a critical pillar of the nation's economy, consistently contributing over 13% to GDP and employing a significant portion of the workforce. However, the sector faces challenges such as structural transformation, limited access to modern technologies, and environmental vulnerability, which have led to a gradual decline in its contribution to the economy. To ensure long-term sustainability and growth, there is a need to address these challenges through targeted interventions that enhance productivity, food security, and farmer welfare.
- The government supports the agriculture sector through several key programs, with seed subsidies and assistance being among the most significant. While these initiatives provide some relief, they may not fully address the broader financial needs of farmers, leading to inefficiencies and suboptimal outcomes. A more effective approach could involve shifting from seed assistance to credit assistance. Credit assistance offers greater flexibility, allowing farmers to invest in a wider range of inputs and technologies, thereby enhancing productivity and resilience. Unlike seed subsidies and assistance, which are limited to specific inputs, credit assistance empowers farmers to make decisions based on their unique circumstances, leading to more sustainable agricultural practices.
- To improve the effectiveness of agricultural programs, several recommendations are proposed. These include expanding credit assistance programs like the People's Business Credit (Kredit Usaha Rakyat, KUR), which would provide farmers with the financial resources needed to invest in essential inputs such as fertilizers and irrigation systems. Additionally, enhancing the role of agricultural extension services (PPL) is crucial for supporting farmers in adopting new technologies and optimizing input usage. The government should also encourage private sector participation in seed production and distribution to ensure the availability of high-quality seeds. Additionally, building and strengthening the supply/demand ecosystem for agricultural commodities is vital. This includes improving market infrastructure and establishing stable demand channels to provide farmers with more certainty and fair compensation for their products. Implementing a robust monitoring and evaluation framework is essential to assess the impact of these programs and make data-driven adjustments to enhance their effectiveness.
- The adoption of genetically modified (GM) products in Indonesia has the potential to improve agricultural productivity by addressing challenges such as pest resistance and environmental sustainability. However, the adoption rate of GM products in Indonesia has been slow, partly due to regulatory delays and public skepticism. The existing regulatory framework is complex and time-consuming, leading to delays in the commercialization of GM products. Additionally, public concerns about the safety and environmental impact of GM products have hindered widespread adoption.
- To increase the adoption of GM products in Indonesia, a comprehensive review of the regulatory framework is necessary. Simplifying the approval process and aligning regulations with international standards would reduce administrative bottlenecks and accelerate the time-to-market for GM products. Developing a clear roadmap for GM

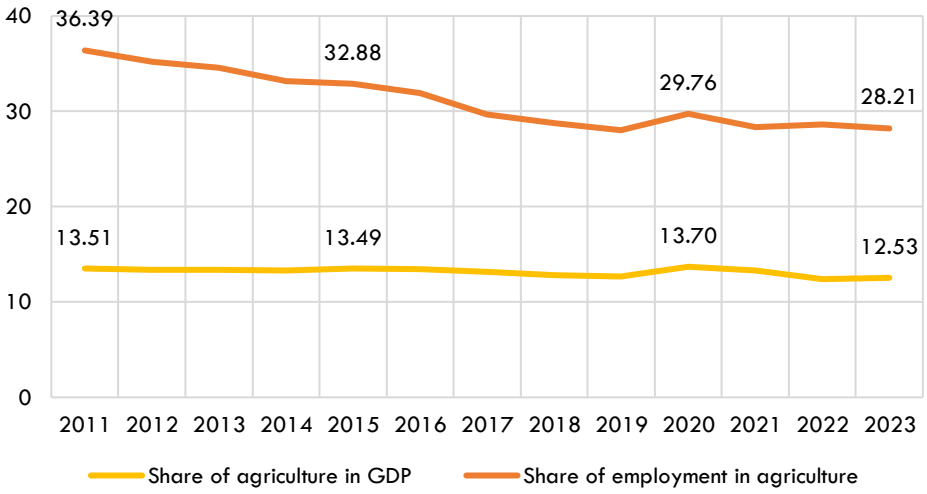
product adoption, which includes public awareness campaigns and the development of supportive infrastructure, is also essential. Furthermore, increasing government involvement in post-commercialization monitoring and providing targeted support for farmers using GM products will help ensure the safe and effective use of these technologies. By implementing these recommendations, Indonesia can enhance its agricultural productivity and strengthen food security through the strategic adoption of GM products.

1.1 The importance of the agriculture sector for the country's economy

Agriculture plays a crucial role in Indonesia's socio-economic landscape by enhancing welfare through food sufficiency, providing jobs, and contributing significantly to the nation's economic structure. From 2010 to 2023, the agriculture sector contributed an average of 13.22% to GDP annually, though it gradually declined from 13.93% to 12.53% over the same period. This decline can be attributed to various factors, including structural transformation, which has shifted the sector's output and employment (Briones & Felipe, 2013). Despite this, the sector remains a fundamental source of livelihood for a significant portion of the workforce. As of 2023, approximately 28.21% of the total workforce, or 39.45 million workers, are in agriculture. Although this figure has not substantially changed from the 39.09 million workers in 2011, the proportion of agricultural employment has decreased from 36.39% in 2011, reflecting broader shifts in the labor market.

The importance of the agriculture sector goes beyond direct economic impact. Increased agricultural output and productivity contribute to food supplies, expansion of exports, labor absorption, capital formation, and increased household purchasing power, which in turn stimulates industrial expansion (Awan and Alam, 2015; Gero and Egbenwede, 2020; Mozumdar, 2012; Squires and Gaur, 2020). Previous studies have also highlighted that growth in the agriculture sector reduces poverty, especially in rural areas, by raising farmers' incomes and generating employment opportunities (Food and Agriculture Organization, 2019; Suryahadi, Suryadarma, & Sumarto, 2009). Furthermore, this sector also helps with food security by providing staple crops, such as rice, corn, and cassava, which meet the basic food needs of the population.

Figure 1: Trends in the Agriculture Sector: GDP Contribution and Employment Share (%)



Source: Statistics Indonesia and CEIC

1.2 Food Security as a National Priority

Food security and improving farmers' welfare are key priorities in Indonesia's 2045 Development framework (Visi Indonesia 2045). The Indonesian government has set an ambitious goal for increasing farmers' productivity by 3.9 times the 2015 level by 2045. The government's focus on food security is driven by various challenges in the food and agriculture sector, including rising food demand, widening food deficits, fluctuating and increasing food prices, hunger, malnutrition, and evolving dietary preferences.

Efforts to enhance food security revolve around three primary objectives. The first is to establish a self-reliant, sovereign, sustainable, and welfare-enhancing food security system. This initiative aims to ensure that food production and agricultural development can meet the needs of the Indonesian population by offering adequate quantities of affordable, safe, and nutritious food. The second objective is to maintain self-sufficiency in carbohydrates and proteins to ensure that the population's calorie and protein consumption meets the recommended levels. To support this effort, the government introduced the Food Hope Pattern (*Pola Pangan Harapan*/PPH), which aims to achieve a perfect score of 100 by 2030, which indicates an optimal allocation and access to food. To achieve this, Indonesia aims to produce these nutrients domestically and reduce import dependency. This initiative also supports broader national development objectives and international commitments, including Sustainable Development Goal (SDG) 2 to end hunger and all forms of malnutrition, as well as SDG 1 to eradicate poverty in all its forms and everywhere. Finally, food security aims to improve farmer prosperity and enhance the value added to agricultural products. Through investment in agriculture, human capital, and the adoption of innovative technologies, Indonesia aims to improve farmers' financial condition and livelihoods.

The two key priorities—food security and the improvement of farmers' welfare—are to be achieved through six main approaches: (1) developing Agricultural Education and Technology Centers, including 30 tropical research centers and 10 basic research centers; (2) integrating

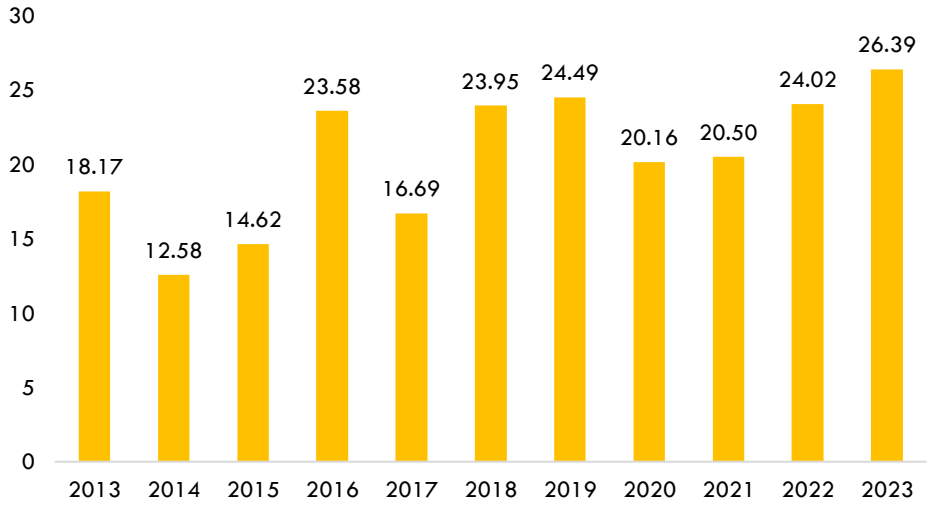
policies from upstream to downstream while strengthening linkages between the agricultural sector, industry, and services; (3) improving farmer institutions and promoting entrepreneurship; (4) increasing investments and improving agricultural infrastructure; (5) improving the quality of human resources in agriculture; and (6) boosting productivity through land use management and the development of maritime agriculture.

1.3 Status of Selected Major Food Commodities

Efforts to enhance food security in Indonesia reveal substantial room for improvement. Around 70 out of 416 regencies in Indonesia have reported low food security index levels (National Food Agency, 2022). Success in improving food security hinges on enhancing the production of certain strategic food commodities identified by the National Food Agency, including rice, corn, soybeans, sugar, large chili, bird's eye chili, onion, garlic, beef, broiler chicken meat, chicken eggs, and cooking oil.

Corn is Indonesia's second most significant food crop after rice (Bappenas, 2014). Essential for human consumption, industrial applications, and as feed for poultry and livestock (Ministry of Agriculture, 2023), corn plays a pivotal role in both food security and the economy. Industrially, it is a key ingredient in products such as cooking oil and sweeteners, which are integral to the food industry. Additionally, corn is a primary source of carbohydrates in animal feed. This supports livestock and poultry farming, ensuring a steady supply of meat, dairy, and eggs, which are also vital components of food security. Indonesia’s favorable agroclimatic conditions enhance its advantage in corn production, allowing cultivation across various regions (Ministry of Agriculture, 2023). Over the past decade, corn production has increased by a significant 45.24%, rising from 18.17 million tonnes in 2013 to 26.39 million tonnes in 2023 (Figure 2).

Figure 2: Corn Production (Million Tonnes), 2013-2022



Source: Ministry of Agriculture, 2023

There are two main types of corn in Indonesia: wet and dry corn kernels. Proper postharvest management is crucial to preserve the quality of dry corn kernels. Since corn primarily comprises carbohydrates, maintaining its carbohydrate content and overall quality through the final processing stages requires meticulous drying and storage. According to Ministry of Agriculture (MoA) data from 2023, the demand for dry corn kernels, with a moisture content of 14%, classified as medium 1 by Indonesian standards, was relatively lower than total production in 2022 and 2021. This means that Indonesia's corn production is sufficient to meet its domestic needs. In 2022, the demand for corn was 16.28 million tonnes, a 24.42% increase from the previous year's 9.79 million tonnes, of which 48.09% went to the feed industry, 27.33% to independent layer farmers, 22.83% to non-feed and non-food industries, 1.23% for direct household consumption, and 0.52% for seed purposes. Notably, the feed industry drove 75.42% of the national demand in 2022.

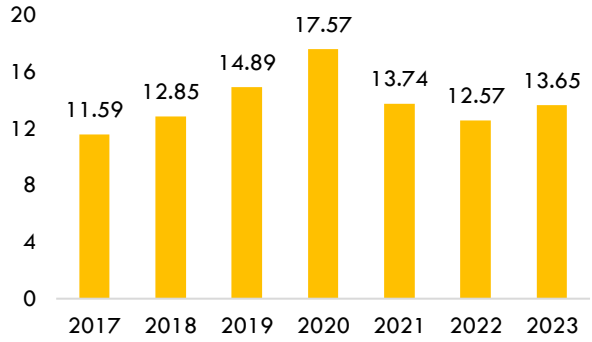
Table 1: Production and Demand for Corn with 14% Moisture Content, 2022

Description	Amount (Tonnes)	Share (%)
Net production	17,738,209	
Demand		
Seeds	84,730	0.52
Household direct consumption	200,239	1.23
Feed	12,274,737	75.42
• Feed industries	7,826,613	48.09
• Independent layer farmer	4,448,124	27.33
Non-feed and non-food industries	3,716,155	22.83
Total demand	16,275,862	100.00

Source: Ministry of Agriculture, 2023

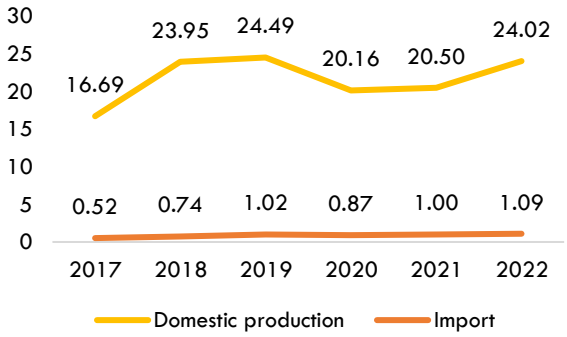
Weekly corn consumption, calculated by multiplying the aggregate weekly per capita consumption by the population size, showed an upward trend between 2017 and 2020. This contrasts with the decrease in rice consumption over the same period, suggesting a possible shift in consumption behavior. However, in 2021, weekly corn consumption declined and then stabilized, averaging 13.32 million kg per week from 2021 to 2023.

Figure 3: Weekly Corn (Wet Corn and Corn Kernel) Consumption (Million kg), 2017-2023



Source: Statistics Indonesia

Figure 4: Domestic Corn Production and Import (Million Tonnes), 2017-2022



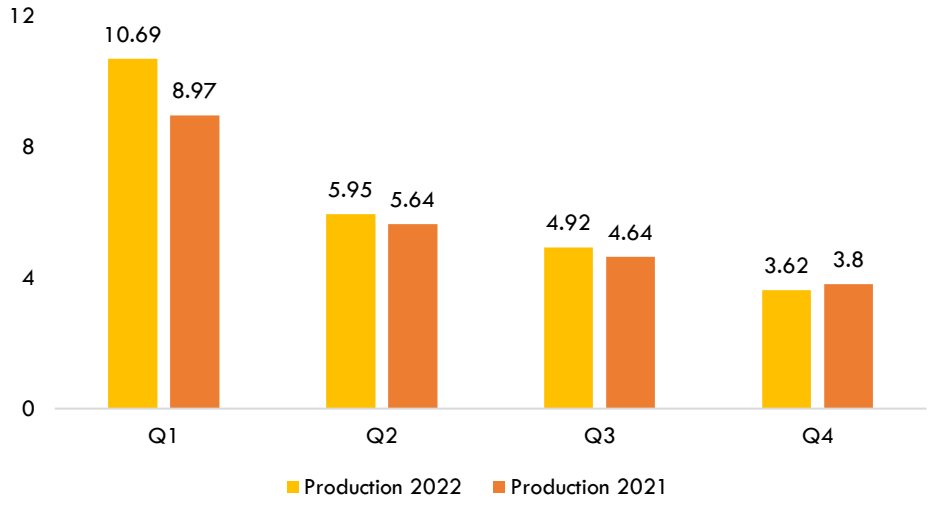
Source: Ministry of Agriculture & Statistics Indonesia

Indonesia's self-sufficiency in corn production can be seen in Figure 4, which shows how the country's corn imports, including seeds, popcorn, and other varieties, remained minimal from 2017 to 2022. The volume of domestically produced corn significantly exceeds the amount imported, reflecting Indonesia's strong agricultural capacity to meet domestic demand. However, this high level of local production is also supported by stringent policies aimed at restricting corn imports. Indonesia's regulatory framework for corn imports is tightly controlled by a Ministry of Trade regulation[26] that limits them to food, feed, and industrial raw materials. Feed imports can also only be conducted by BULOG, Indonesia's state-owned food logistics company, following a government assignment based on a ministerial proposal. Imports for food and industrial purposes are restricted to companies holding an API-P (Producer Import Identification Number/*Pengenal Importir Produsen*) license, which the Ministry of Trade issues to companies approved as importers of raw materials for production.

In Indonesia, corn production experiences seasonal fluctuations. Data from 2021 and 2022 show a consistent pattern: production peaks in the first quarter, with its share of total production reaching 42.46% in early 2022. However, this share declines sharply by the fourth quarter, dropping to 14.36% in 2022. This seasonal variation underscores a growing imbalance, with pronounced differences between peak and low production periods. Such fluctuations can lead to price volatility, particularly towards the end of the year. Moreover, as Indonesia's population continues to grow, corn consumption is expected to rise accordingly. It is crucial to ensure that corn production consistently meets this increasing demand. Addressing these seasonal imbalances and stabilizing production throughout the year will be essential to maintaining supply levels, managing price stability, and supporting food security.

[26] Regulation of the Minister of Trade No. 20 of 2016 on Provisions for Corn Imports, later amended by Regulation of the Minister of Trade of the Republic of Indonesia No. 21/2018 on Amendments to the Regulation of the Minister of Trade No. 20/2016 on Import Provisions for Provisions for Corn Imports.

Figure 5: Quarterly Domestic Corn Production (Million Tonnes), 2021-2022



Source: Ministry of Agriculture, 2023

The Indonesian government has implemented several measures to achieve its goal of food security. These include directly providing farmers with essential agricultural inputs, such as seeds and fertilizers. Additionally, the government has devised strategies for rural transformation to accelerate income growth and reduce poverty, thereby enhancing the overall livelihoods in rural communities. Another critical component of the government's approach is the modernization of food systems, which involves adopting advanced agricultural technologies and practices to improve crop productivity. However, significant challenges remain (Sudaryanto, 2022).

Strengthening Indonesia's Corn Fields

"I can't deny that my financial situation has improved," says Pak Turiman, a farmer from South Lampung. For years, he struggled with the challenges of traditional farming—unpredictable weather, pest infestations, and low yields. But when he switched to genetically modified (GM) corn seeds, the results were transformative.

"The difference is significant. The results from other varieties were not as good," he shares, explaining that weed and insect control is easier, and the corn's weight and color are more appealing to buyers.

Pak Turiman's experience is echoed not only in other parts of Lampung province, one of Indonesia's food barns, but also thousands of kilometers away in Sumbawa, West Nusa Tenggara, where another farmer, Pak Hamzah, has reaped similar benefits from GM corn seeds.

"The impact of using GM corn seeds is efficiency—in costs, time, and management," he explains.

These stories from farmers like Pak Turiman and Pak Hamzah highlight the tangible benefits of GM seeds: efficiency in weed and insect control management that leads to better and improved marketability.

More support needed

Yet, despite these success stories, the path to widespread adoption of GM corn seeds in Indonesia remains fraught with challenges.

Negative perceptions of GM products have lingered for years, fueled by concerns over health risks, environmental impact and dependency on corporate-controlled seeds, even though Indonesian state-owned enterprises also produce GM products. These perceptions contribute to a long regulatory approval process that hinders the timely launch of new technologies that can benefit farmers and strengthen food security.

“It is a bit difficult because it has only been two years since this technology was properly introduced into the country, so the precautionary principles are stricter,” says Professor Bambang Prasetya, Chairman of the Indonesia Biosafety Committee (KKH-PRG Indonesia). “A lot of improvements are needed to properly help farmers in the field. We also have a responsibility to consumers and mustn’t lose out on the benefits of GMO technology.”

The experience of the Philippines, a leader in biotechnology crops, shows these concerns are unfounded and provides a glimpse of what the future could hold for Indonesia. Over the past two decades, Filipino farmers have embraced GM seeds, with about 90 percent of the country’s yellow corn now genetically modified. This shift has led to significant yield increases, despite a reduction in cultivation area.

An important factor behind this success is a supportive regulatory environment, according to Abraham Manalo, executive director of the Biotechnology Coalition of the Philippines.

"Regulations should be stringent, science-based, but streamlined… Yellow corn stands on solid ground today because of our regulation," he told a forum last February organized by the Southeast Asian Regional for Graduate Study and Research in Agriculture.

Meeting farmers needs

In Indonesia, the need for greater government support is clear. The demand for corn seeds is vast—1,000 tonnes annually—but farmers say the support they hope for is not free seeds.

“Instead of distributing subsidized corn seeds, maybe the government can provide financial assistance or credit support,” says Pak Wayan. In his town in East Lampung, seeds are allocated without fully considering the specific needs of each farmer's land, resulting in mismatches that either lead to low yields or wasted seeds.

With financial assistance or credit support, however, farmers would be free to choose the types of seeds they know would work well on their land and purchase other inputs needed. In South Lampung, farmers have taken advantage of the low-interest rate People's Business Credit (*Kredit Usaha Rakyat*, KUR) program to lease land and prepare the soil. In East Lampung, they use credit assistance for seed preparation and purchasing supplies.

Instead of distributing more subsidized corn seeds, expanding the KUR program could then be a more effective way of supporting farmers. This approach would empower farmers to make informed decisions, leading to better outcomes for themselves and for Indonesia’s agricultural sector as a whole.

2. Seed Subsidy Policy and Credit Assistance

Agricultural inputs, such as fertilizer, seeds, pesticides, and irrigation fees, account for a significant portion of total expenses per hectare per planting season (CIPS, 2021). While these inputs are vital for maximizing crop yields, they can lead to higher financial costs that could potentially diminish profit margins. Additionally, their suboptimal use poses environmental risks, contributing to the gradual degradation of physical, chemical, and biological soil conditions (Cuevas et al., 2019). The reliance on these inputs also makes agricultural production vulnerable to disruptions, as any disturbances in their availability can adversely affect crop yields (Ahvo, 2023). Thus, optimizing the use of external inputs is essential for sustainable agriculture, which would enhance productivity while mitigating environmental impacts (Xie et al., 2019).

Considering the importance of quality inputs and the vulnerability of farmers to input availability and price shocks, the MoA intervened in 1986 by providing seed subsidies and an assistance program. The government cooperated with state-owned seed producers, Sang Hyang Seri (SHS) and Pertani, for this seed provision program (CIPS, 2021).

Table 1: Average Share of Agriculture Inputs in Farming Cost Per Hectare Per Season, 2017

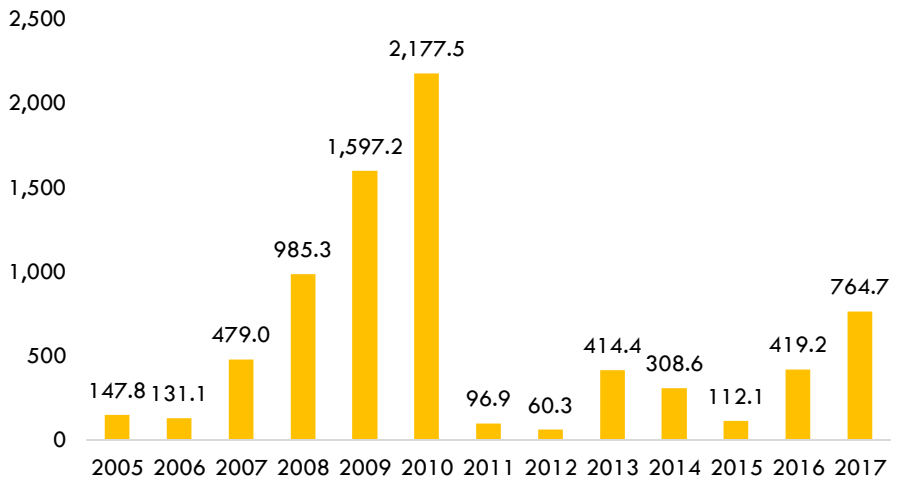
Cost Component	Wetland Paddy		Dryland Paddy		Corn		Soybean	
	Thousands IDR	% of Total Cost	Thousands IDR	% of Total Cost	Thousands IDR	% of Total Cost	Thousands IDR	% of Total Cost
Fertilizer	1,278.00	9.43	710.59	8.40	1,370.09	13.44	449.18	4.97
Seeds	514.36	3.79	401.96	4.75	899.12	8.82	591.02	6.53
Pesticide	569,55	4.20	296.59	3.51	352.02	3.45	363.57	4.02
Charges and fees	78,30	0.58	23.46	0.28	42.19	0.41	52.85	0.58
Total	2,440.21	18.00	1,432.60	16.94	2,663.42	26.12	1,456.62	16.10

Source: CIPS, 2021

2.1 Seed Subsidy Program

From 1986 to 2012, Indonesia's seed subsidy program operated under an open distribution model. Subsidized seeds were provided by state-owned enterprises, SHS and Pertani, and were readily available at stores, giving farmers unrestricted access. In 2013, the subsidy approach shifted to a closed system, which involved farmers obtaining subsidized seeds through farmer groups registered in the List of Proposed Farmer Recipients of Subsidized Seeds (*Daftar Usulan Petani Penerima Benih Bersubsidi*, DUPBB). The program was eventually phased out due to inefficiencies. Several studies found that the program faced several constraints, including the untimely availability of seeds, insufficient quantities of subsidized seeds, and the unavailability of subsidized seeds in certain regions (MoA, 2018; Elis, 2019). Subsidy values also fluctuated, with the highest subsidy realization in 2005 at IDR 2,177 billion and its lowest at IDR 60 billion in 2017 (**Figure 6)**.

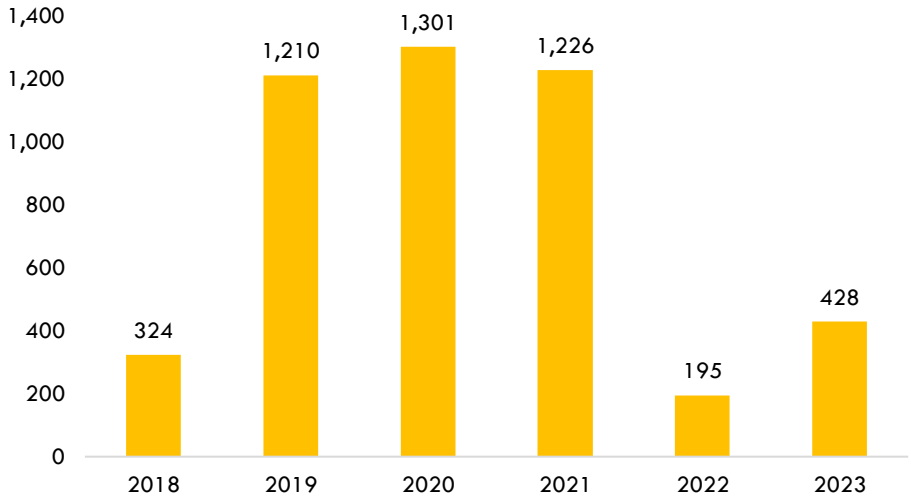
Figure 6: Seed Subsidy Realization (IDR Billion), 2005-2017



Source: CIPS, 2021

After the seed subsidy program ended in 2018, the government shifted to seed assistance, which involves providing eligible farmers with free seeds (MoA, 2017; Alta, 2021; Sayaka, 2023). This transition focused on essential crops like paddy and corn, guided by MoA Regulation No. 03/2015 on Guidelines for Special Efforts to Boost Rice, Corn, and Soybeans Production through Irrigation Network Improvements. The MoA Regulation No. 62/2016 further outlined the management and distribution of government assistance, emphasizing support for Seed Source Areas (DMB) and inbred rice seeds. Starting at IDR 323.99 billion in 2018, the support surged to IDR 1,210.03 billion in 2019 and peaked at IDR 1,300.59 billion in 2020. However, 2022 saw a sharp drop to IDR 194.79 billion before reversing in 2023 with an increase to IDR 428.17 billion (**Figure 7**)

Figure 7: Seed Assistance Realization (IDR Billion), 2018-2023



Source: Ministry of Agriculture, 2023

From 2018 to 2021, the MoA provided seed assistance to 1.8 million hectares of paddy fields annually, distributing around 43.9 million seeds (Sisungkunon, et al., 2022). In 2021, the free

seeds were notably allocated to paddy fields in West Java (15%), followed by East Java (14%) and Central Java (12%). Outside Java, South Sulawesi and Lampung received the highest proportions of seed assistance at 8% and 6%, respectively, relative to their proportions of national paddy fields.

The government provides rice and corn seed assistance during both the rainy and dry seasons each year. This initiative is coordinated by the Agriculture Office, which issues a circular to the Agricultural Extension Center (*Balai Penyuluh Pertanian*, BPL), which then relays the information to local farmer groups. Rice farmers receive significant support. In West Nusa Tenggara, farmers require 50-60 kg per planting cycle, all of which can be obtained for free through the seed assistance program. Initially, in early 2017, corn seed adoption was low among farmers, making the subsidy program especially appealing and beneficial. The annual demand for corn seeds is substantial, with 1,000 tonnes required, of which 900 tonnes are commercial seeds and 100 tonnes are provided through the government subsidy program.

According to Statistics Indonesia's 2022 Crop-Cutting Survey, the percentage of corn households receiving seed assistance from central and local governments remained low, at only 6.29% and 5.52%, respectively. Similarly, for soybean households, 19.93% received assistance from the central government and 10.36% from local governments. These figures highlight persistent challenges in reaching many farming households with seed assistance programs. Moreover, the survey indicated that corn and soybean yields per hectare among households receiving seed assistance were generally lower than those not receiving aid. Specifically, corn yields were approximately 56.02 quintals per hectare (q/ha) for assisted households versus higher yields among non-assisted households. Similarly, soybean yields were around 15.13 q/ha for assisted households compared to 15.56 q/ha for non-assisted households.

2.2 Exploring Other Options: Credit Assistance

Compared to seed subsidies and assistance, credit assistance offers greater versatility and adaptability to the diverse needs of farmers. In Indonesia, farmers also face various other challenges, such as fluctuating market prices, limited access to technology, and unpredictable environmental conditions, all of which necessitate a more flexible support system. There are several important considerations as to why credit assistance may be more effective than seed assistance.

Challenges with Seed Quality

Seed subsidies and assistance, while well-intentioned, may not always be effective due to misalignments with market demand and the potential barriers they create to the development of a competitive seed industry (Sayaka et al., 2023). Our interviews with farmers reveal that their preferences play a crucial role in determining the varieties they choose to plant, influenced by factors such as land conditions, local climate, and individual needs.

In West Nusa Tenggara, for example, the Agriculture Office distributes a single type of seed to large groups of farmers without accounting for the diverse soil types and terrain within these

groups. Field Agricultural Extension Workers (*Penyuluh Pertanian Lapangan*, PPL) assign one seed variety to each farmer group based on their general assessment. However, this approach often fails to address the unique characteristics of different land types. Seeds that are well-suited to one environment may perform poorly in another. Sloping land that requires more water and flat land needing less water might benefit from distinct seed varieties. Consequently, even neighboring farmers may have different seed recommendations based on the unique conditions of their land, leading to suboptimal harvests.

The timing of seed distribution is another concern, with farmers reporting that government seed assistance often arrives unpredictably. As noted previously, different food crops have varying seasonal requirements, with some thriving in the dry season and others performing better during the rainy season. Providing seeds at inappropriate times or with inconsistent scheduling can lead to inefficiencies if they do not align with the optimal planting periods. This misalignment can significantly affect the effectiveness of seed distribution and ultimately impede agricultural productivity.

Furthermore, the quality of seeds is an additional issue. One of our farmer respondents explained that the quality of government-supplied seeds has declined over the years. This has led many farmers to prefer purchasing private or commercial seeds, which are often more reliable and better suited to their needs. Another farmer said some of the seeds provided by the government did not perform as well as expected, particularly compared to other varieties like the commercial ones available.

Autonomy in Investment Decisions

Our interviews with farmers in South and East Lampung revealed the different ways they use capital based on their respective needs. In South Lampung, farmers typically allocate capital toward leasing land, which costs around IDR 6 million to 7 million per hectare annually. To prepare the land for planting, especially in areas where the soil's acidity is high, they enrich the soil with cow or chicken manure. This manure is then plowed into the ground using tractors, a crucial step in ensuring soil fertility. The availability of capital enables farmers to expedite this land preparation process with tractors, which are more efficient than manual methods. In contrast, farmers in East Lampung, where most own their land and do not require leases, primarily spend their capital on seed preparation and purchasing maintenance supplies, such as herbicides. Given the critical role of capital and other inputs, credit assistance programs could significantly enhance farmers' productivity by offering greater flexibility than seed assistance.

Farmers operate in a dynamic environment where their needs shift due to various factors like weather conditions, market prices, pest outbreaks, and changes in soil quality. Credit assistance allows farmers to adapt to these changing circumstances by reallocating funds to different needs as they arise. Unlike seed assistance, which limits support to a specific type of input, credit assistance enables farmers to direct funds to the areas most critical to their unique situations. Providing credit assistance empowers farmers to make targeted decisions, ensuring that resources are allocated where they are most needed.

Seed Scarcity May Not Be the Most Urgent Issue

While seeds are important in agricultural production, it is also essential to consider that not all farmers experience a shortage of seeds; some face financial barriers that hinder their ability to fully engage in the agricultural process. These farmers need financial assistance for various purposes, such as securing short-term loans to cover immediate expenses or investing in other critical inputs like fertilizers, equipment, or irrigation systems. Although seeds are an important component of agriculture, they account for just 3.6% of the total agricultural input needs. This statistic underscores that comprehensive support that includes financial aid and capital is necessary to address the broader range of challenges faced by farmers. This type of support can significantly boost productivity and help farmers overcome obstacles beyond seed availability.

Additionally, the price of corn remains highly unpredictable. During peak harvest seasons, farm-level prices often fall below the breakeven point (BEP), jeopardizing farmers' ability to continue operations. Many are then compelled to seek high-interest loans to fund their next planting cycle, further straining their livelihoods. In an interview with farmers from Sumbawa, they emphasized that their primary concern is the price of their harvested crops. According to them, the corn price does not need to be excessively high; just reaching IDR 4,000 per kilogram would suffice, compared to the current price of around IDR 3,500 per kilogram. The combination of these financial pressures and market volatility has a detrimental effect on farmers' welfare, emphasizing the need for more comprehensive support systems to enhance productivity and stability.

Lack of Financial Access Among Indonesian Farmers

Despite the importance of financing, farmers face a pervasive lack of access to formal financial resources. This stems from several factors. First, an information gap persists among farmers regarding available financial products and how to access them effectively. Second, banks often view agriculture as a high-risk sector, making them reluctant to extend credit to farmers. Moreover, intricate and cumbersome loan application procedures and collateral requirements further restrict small-scale farmers' credit access. While subsidies and assistance for seeds can alleviate the initial financial burden of purchasing inputs, they do not address the fundamental issue of financial exclusion. Access to credit, on the other hand, will affect agricultural performance (Haryanto et al., 2023) by reducing capital constraints and encouraging investment in modern technology, which leads to productivity and output growth (Alhassan, 2020; Sekyi, 2017).

2.3 Current State of Credit Assistance

The Indonesian government has implemented the KUR, a subsidized credit program, to enhance agricultural productivity (Haryanto et al., 2023). Similar programs have been implemented in other developing countries, such as India, Ghana, Pakistan, and Senegal, where access to credit has been shown to boost agricultural output and technical efficiency. By enabling farmers to invest in advanced technologies, superior inputs, and improved

production techniques, such programs facilitate long-term productivity gains through enhanced irrigation, land preparation, and crop protection measures.

Despite its potential benefits, the KUR program's impact is constrained by its uneven distribution. While its utilization in the agricultural sector has increased from 24% in 2016 to 28% in 2020, its reach among farmers remains limited. Reports indicate that of Indonesia's 33 million farmers, only 1.29 million received direct support from KUR, highlighting continued challenges in accessing formal financial channels. Consequently, many farmers turn to informal sources such as friends, relatives, input providers, and collectors to secure financing, with approximately 30% of rural Indonesian farmers relying on these alternatives (Haryanto et al., 2023).

2.4 Best Practices from Other Countries

Thailand

In Thailand, agricultural credit policies are mainly managed by three financial institutions: the Bank of Thailand, commercial banks, and the Bank of Agriculture and Agricultural Cooperatives (BAAC). Since 1968, the Bank of Thailand has provided financial aid at below-market rates to support the agricultural sector. Commercial banks generally focus on lending to large-scale agricultural businesses or indirectly related sectors. The BAAC, which was established to directly benefit the agricultural sector, offers targeted financial services and loans to farmers, farmer groups, and cooperatives, with programs designed to support both new and established agricultural enterprises (Ahmad and Manh, 2023).

With a mission to enhance farmers' livelihoods and support agricultural cooperatives, the BAAC provides a comprehensive suite of financial services, including loans, deposit services, and development programs. In this vein, the BAAC introduced various initiatives, such as the Smart Farmer Project, which helps new and tech-savvy farmers start and modernize their operations, and the Farmer Credit Card, designed to improve access to essential agricultural inputs. The BAAC also offers emergency financial relief by reducing interest rates and extending loan repayment periods during crises.

The BAAC's 2023 Annual Report reports that it distributed THB 8.57 billion (IDR 3.8 trillion)[27] in loans that year that were meant to help farmers expand their businesses and increase productivity. The data for fiscal year 2023 also shows that BAAC's Debt Moratorium for Small Debtors benefited over 1.85 million farmers, covering a total of THB 257.25 billion in principal loans. This initiative, combined with the Good Payment Reward Program, which included millions of participants, demonstrates clear evidence of how financial institutions can ease the burden of debt for small-scale farmers. Furthermore, BAAC's credit extension programs provided THB 70.5 billion in credit for projects across various agricultural sectors, including over 300,000 rice farmers during the 2023-2024 production year. Similar efforts were made for the maize and sea prawn industries. This widespread reach shows how structured credit assistance can provide financial access to different farming communities.

[27] THB 1 = IDR 444.21 (2024 average)

Vietnam

The Vietnamese government has implemented a range of credit policies to support agriculture, including interest rate caps and initiatives like Decree 55, which facilitates uncollateralized lending. Interest rate caps limit the cost of borrowing, making loans more affordable for farmers who need capital for agricultural activities. With Decree 55, farmers can access loans without the need to provide collateral, which can be a major barrier for those who lack sufficient assets (World Bank, 2019).

The Vietnamese government also has various initiatives involving financial institutions to support agriculture and target social groups. One example is the Vietnam Development Bank (VDB), which is focused on mobilizing capital for investment in agriculture and rural areas. In 2019, VDB financed 352 projects through two primary mechanisms: state investment credit and the re-lending of Official Development Assistance (ODA) funds. These are available for projects in sectors such as aquaculture, plant varieties, and industrial salt production. The lending interest rates are determined by Vietnam's Ministry of Finance (MoF) and can range from 0% per annum for canal solidification projects to 15% per annum for other agricultural ventures. Meanwhile, the terms for re-lending ODA funds depend on specific agreements established between VDB and the MoF, ensuring tailored financial support for various agricultural initiatives. VDB also offers guarantees for loans taken by small and medium enterprises (SMEs) from commercial banks. This strategic support resulted in a total loan disbursement of approximately VND 54 trillion (IDR 34.3 trillion)[28] (World Bank, 2019).

2.5 Recommendations

The government may want to consider implementing the following strategies to enhance the effectiveness of its agricultural programs, improve farmer welfare, strengthen food security, and bolster the long-term growth and resilience of the sector:

1. Given the limitations of seed assistance programs in addressing the broader financial needs of farmers, expanding credit assistance programs like KUR should be prioritized. Credit assistance offers greater flexibility, allowing farmers to invest in various critical inputs such as fertilizers, equipment, and irrigation systems, which are essential for sustainable agricultural production. To improve access, the government should simplify loan application procedures, reduce collateral requirements, and raise awareness among farmers about available financial products. Targeted financial literacy programs could also help bridge the information gap and empower farmers to make better financial decisions.
2. Enhancing the role of PPL is crucial for the success of both seed and credit assistance programs. By providing continuous training and resources, PPLs can better support farmers in adopting new technologies, selecting appropriate seed varieties, and optimizing input usage. This support will help mitigate environmental risks associated with the suboptimal application of agricultural inputs and improve overall farm productivity. Additionally, the government should consider integrating modern agricultural practices and sustainable farming techniques into extension services,

[28] 1 VND = IDR 0.6359 (2024 average)

ensuring that farmers are well-equipped to handle the evolving challenges of agriculture.

3. To foster a competitive seed industry and ensure the availability of high-quality seeds, the government should encourage greater private sector participation in seed production and distribution. Public-private partnerships (PPPs) could be established to enhance the research, development, and commercialization of new seed varieties, particularly those adapted to local conditions.
4. The government should build or upgrade the supply and demand ecosystem for agricultural commodities to provide farmers with more certainty in the marketplace. This could include improving market infrastructure, facilitating better access to price information, and establishing more stable demand channels, such as long-term contracts or guaranteed minimum prices. Such measures would ensure that farmers are fairly compensated for their hard work, especially during peak harvest seasons when prices often drop below the breakeven point.
5. Finally, it is recommended that the MoA implements a robust monitoring and evaluation framework to continuously assess the effectiveness of seed and credit assistance programs. By regularly collecting data on program outcomes, such as crop yields, farmer satisfaction, and environmental impact, the MoA can identify areas for improvement and make data-driven decisions to enhance program effectiveness. Additionally, periodic consultations with farmers and other stakeholders can provide valuable insights into the on-the-ground realities, ensuring that government interventions remain relevant and responsive to farmers' needs.

3. Use of Genetically Modified Products

3.1 Genetically Modified Product Adoption

As Indonesia navigates the evolving landscape of modern agriculture, integrating advanced biotechnological solutions may become a key strategy for enhancing food security. Genetically modified (GM) products, in particular, hold transformative potential by addressing critical challenges such as pest resistance, yield enhancement, and environmental sustainability.

The journey of GM technology in Indonesia began in the early 2000s with the introduction of regulatory frameworks aimed at overseeing its development and application. Specifically, the enactment of Law No. 21/2004 on the Ratification of the Cartagena Protocol on Biosafety and the issuance of Government Regulation No. 21/2005 on Biosafety of Genetically Engineered Products marked Indonesia's formal entry into GM technology. Among these innovations, GM corn has gained prominence for its potential to address pest resistance and improve agricultural productivity significantly. As of 2023, the GoI has approved ten GM seeds, including corn and sugarcane.[29]

The adoption of GM crops presents several advantages. Oliver (2014) suggests that GM crops could be a solution to matching the rising global food demand with increased crop yields. Klümper and Qaim (2014) found that GM seeds have, on average, boosted crop yields by 21% due to improved pest control rather than higher genetic yield potential. Furthermore, GM crops

[29] Purnama, S. (2023, May 24). Kementan: 10 produk rekayasa genetik sudah terdaftar di pemerintah. *Antara News*. https://www.antaranews.com/berita/3553500/kementan-10-produk-rekayasa-genetik-sudah-terdaftar-di-pemerintah

have decreased pesticide use by 37% and cut pesticide costs by 39%, resulting in an average profit increase of 69% for farmers who adopt these technologies. The International Service for the Acquisition of Agri-biotech Applications (ISAAA) reported in 2019 that biotech crops had conserved biodiversity by saving 231 million hectares of land from 1996 to 2018 and reduced pesticide usage by 8.3% during the same period, significantly diminishing environmental impact and CO2 emissions.

Interviews with farmers in Sumbawa, East Lampung, and South Lampung who have used GM corn seeds for approximately two years revealed several consistent benefits, collectively referred to as the "4E" advantages of using biotech seeds: cost efficiency, time efficiency, labor efficiency, and fertilizer efficiency. In Sumbawa, the production costs to plant and harvest non-GM corn seeds range from IDR 12-13 million over three months. In contrast, the production cost when using GM seeds declines to IDR 6-7 million over five months. These seeds are resistant to herbicides, allowing effective weed control without damaging the crops. Additionally, a 5 kg package of the GM seeds they have been using contains approximately 22,000 seeds, compared to around 18,000 in non-GM varieties, providing greater seed density and contributing to maintenance cost savings. Their experience mirrors findings by Brookes and Dinh (2020) on GM corn in Vietnam, which found that GM varieties significantly outperformed conventional corn, yielding 30.4% more and generating economic gains of USD 6.84 (IDR 109,440)[30] to USD 12.55 for every additional dollar spent on GM seeds. Moreover, GM corn led to a 78% reduction in insecticide use, highlighting its efficiency in minimizing pesticide dependency. These findings suggest that GM varieties empower farmers to produce higher yields with fewer resources.

Despite concerns regarding the safety of GM crops and their potential health effects, these crops have been on the global market for nearly three decades (ISAAA, 2015) with no evidence of health risks from their consumption. Research from the Genetic Literacy Project (n.d.), as referenced in ISAAA (2014), indicates there is no scientific evidence linking GM crops to allergies, cancer, or any other adverse health effects in humans. On the contrary, they have even demonstrated several benefits. Pellegrino et al. (2018), as cited in Smyth (2019), found that Bt maize exhibited significantly lower concentrations of harmful mycotoxins (29%), fumonisins (31%), and trichothecenes (37%). These toxins are both toxic and carcinogenic to humans and animals, posing particular risks in developing economies where access to food safety testing is limited. Fumonisins, for example, are linked to higher rates of neural tube defects in populations with maize-based diets (Missmer et al., 2006, as cited in Smyth, 2009). Biotechnological advancements have also led to the development of nutritionally enhanced crops, such as biofortified rice, maize, and cassava, which are rich in essential micronutrients like vitamin A, iron, and zinc (Hefferon, 2014). These crops are designed to combat malnutrition, particularly in developing countries, by addressing micronutrient deficiencies. Hefferon (2014) suggested that biofortified crops have had a positive impact on the nutritional status of populations with limited access to diverse diets.

Another concern often raised against GM seeds is the potential development of resistance among pests and weeds, known as superbugs and superweeds. The worry is that the extensive planting of GM seeds may create selective pressure, leading to the emergence of

[30] USD 1 = IDR 16,000

resistant insect populations over time and diminishing the effectiveness of transgenic traits. Interviews with farmers suggest that some concerns may be less severe than anticipated. For instance, while there were initial worries about the impact of Roundup on soil quality, these were not substantiated by recent findings. Various methods, such as top dressing and spray treatments, effectively maintain and enhance soil health, with only minor changes in soil texture reported.

Public opinion on GM crops in Indonesia has been shaped by historical events such as the failure of Bt Cotton nearly two decades ago and ongoing debates over GM soybean seeds. The Indonesian peasants' union, Serikat Petani Indonesia (SPI), has vehemently opposed government plans related to GM crops, citing concerns about health risks, reduced local seed diversity, and increased dependency on corporate-controlled seeds. SPI advocates for cultivating and enhancing local seed varieties to promote farmer independence and productivity. In contrast, an interview with a local farmer from Sumbawa, who has used GM corn for two years, reveals a different perspective. The farmer reported no reliance on corporate-controlled seeds and highlighted several efficiency benefits, including cost savings, time efficiency, and improved fertilizer utilization. Notably, the farmer noted that they can still use non-GM seeds interchangeably with GM varieties, allowing for flexibility in their farming practices.

Additionally, insights from government sources suggest that a lack of awareness and misinformation from certain groups may influence negative public perceptions of GM seeds. These factors might hinder the promotion of GM seeds, thereby contributing to farmers' ongoing reliance on conventional pesticides. Misinformation and lack of awareness can create fear and resistance towards GM crops, leading to skepticism and reluctance to adopt these technologies.

3.2 Best Practice from Other Countries

In Southeast Asia, the Philippines is a regional leader in biotechnology (Mojica-Sevilla, 2022b), setting a benchmark for best practices that Indonesia can learn from. The successful commercializing of GM products in the country depends on a robust regulatory framework, sustained government support, a clear vision for the sector's growth, and effective communication strategies (Manalo, 2024). Government support in the Philippines for the commercialization of biotech products has been foundational in establishing the country as a leader in the sector. This support has manifested in various ways, beginning with the early institutionalization of biotechnology research by creating the National Institutes of Biotechnology and Applied Microbiology (BIOTECH) at the University of the Philippines Los Baños in 1979. This move set the stage for subsequent administrations to prioritize biotechnology as a key driver of agricultural productivity, food security, and sustainable development. Over the years, the Philippine government has consistently provided funding and resources to bolster biotech research and development (R&D). This includes budgetary allocations for institutions like the Philippine Rice Research Institute (PhilRice) and the Institute of Plant Breeding, which have been instrumental in developing biotech innovations, such as Golden Rice and Bt eggplant. Additionally, the government has supported the creation of a science-based regulatory framework that ensures the safe commercialization of biotech

products, reflecting a commitment to aligning with international standards while fostering innovation.

Further, the government has played a pivotal role in raising public awareness and acceptance of biotech products. Initiatives, such as the designation of National Biotechnology Week by Presidential Proclamation No. 1414, aim to educate the public on the benefits and safety of biotechnology. This consistent advocacy has been crucial in building public trust and encouraging the adoption of biotech innovations. The government's strategic focus has also extended to creating a favorable legal environment for biotech commercialization. By recommending the enactment of comprehensive legislation for GM products, the government seeks to provide robust legal protection against challenges that could hinder the sector's growth. This legislative effort is designed to future-proof the regulatory environment, ensuring that it can adapt to the rapid advancements in biotechnology while providing a stable platform for continued innovation and commercialization.

In a groundbreaking move, the Philippines set a precedent as the first ASEAN nation to authorize the commercial use of a GM crop for food and feed, the Bt corn, in 2022. Amirhusin (2023) described that initially, the cultivation began with one specific variety (Corn, Mon810), covering 10,769 hectares in 2003. This expanded significantly to 558,619.40 hectares by March 2018, predominantly planted with insect-resistant and herbicide-tolerant varieties. By 2017, the Philippines ranked 13th globally in biotech crop cultivation, with a total of 642,000 hectares of biotech corn planted, including 35,000 hectares of herbicide-tolerant and 607,000 hectares of combined insect-resistant and herbicide-tolerant varieties, supported by over 470,500 Filipino farmers. Varieties such as GA 21, NK603, BT11, and Mon89034, among others, are approved for cultivation, featuring insect resistance or herbicide tolerance traits. Between 2003 and 2016, the deployment of biotech corn in the Philippines generated an estimated USD 724 million in farm-level economic benefits, with a substantial USD 82 million contribution to national farm income in 2016 alone.

The Philippines also made strides by approving the revised Joint Department Circular No. 1 on February 15, 2022 (Mojica-Sevilla, 2022a). The reforms in the circular are anticipated to significantly shorten approval timelines from 85 days to a maximum of 40 days (Mojica-Sevilla, 2022b) and reduce compliance costs for commercializing genetically engineered crops. This streamlined regulatory policy, signed by five department secretaries and published on March 8, 2022, became effective 15 days later. This move reaffirms the Philippines' leadership in biotechnology following its approval of Golden Rice for commercial propagation in 2021.

Further regulatory improvements were also made to genome editing regulation in the Philippines (Mojica-Sevilla, 2022c). On May 19, 2022, the Philippine Department of Agriculture issued Memorandum Circular No. 8 outlining the rules and procedures for evaluating new plant breeding techniques. This regulation aims to provide a science-based and efficient process for assessing genome-edited plants to determine whether they should be classified as genetically engineered (GE). The regulation distinguishes between products with novel genetic combinations derived from modern biotechnology, considered GE, and those without such combinations treated as conventional products. To facilitate the evaluation process, developers must submit their genome-edited products to the Bureau of Plant Industry for a technical consultation. A Certificate of Non-Coverage is issued if the product is deemed non-GE, allowing it to bypass the more stringent GE regulations. This streamlined process is

expected to significantly reduce the approval timeline and compliance costs, fostering innovation and adoption of genome editing technologies in the Philippine agriculture sector.

In contrast to the Philippines, Indonesia faces challenges in the swift adoption of GM products, primarily due to regulatory delays. The post-approval monitoring regulations were only implemented in 2023. Before commercialization, companies with approved GM seeds must establish a seed propagation site, a process that can take about a year. These regulatory hurdles significantly slow the adoption of biotech products in Indonesia, limiting the sector's agility compared to the Philippines. Additionally, Indonesia requires further approval for crops resulting from the crossbreeding of two GM products, known as “stacked events,” even though both plants have been independently assessed and approved as single events. This is not the case in the Philippines. Moreover, the government mandates assessments throughout both the trial phase and during GM seed release, involving duplicate processes, such as profitability and multilocation tests. This duplication results in increased compliance costs for scientists, reaching approximately USD 1 million per trial.

To understand Indonesia’s regulatory framework for GM products, it is important to note that the government adopts a precautionary approach to ensure the safety of food, feed, and the environment in the release and distribution of GM products. Before GM products can be distributed, the government, through several institutions, initiates a structured evaluation process. This begins with the applicant submitting their request to the relevant ministry, such as the MoA, the Ministry of Environment and Forestry, or the National Agency of Drug and Food Control. The request is then forwarded to the Biosafety Commission (KKH) and subsequently to the Technical Team for Biosafety (TTKH).

The TTKH, comprising experts in food, feed, and environmental sciences, conducts a comprehensive assessment based on laboratory tests, including evaluations of allergenicity, toxicity, and other factors. This assessment relies on data provided by the applicant, with laboratories required to be accredited under a Mutual Recognition Arrangement. It is important to note that the TTKH typically does not perform the initial evaluations; these products are often tested in other countries before reaching Indonesia.

Upon completion of the evaluation, the results are published on a public website for two months, during which the public can submit questions. These inquiries are addressed by the technical team. If the product is deemed safe, the results are sent back to the MoA, and the Indonesian Food and Drug Authority (BPOM) issues a permit for distribution, followed by the official release of the new variety. Should any issues arise during ongoing monitoring or if public complaints are received, the product may be withdrawn from the market.

The approval process for GM seeds in Indonesia typically takes six months to two years, with delays often due to iterative reviews between KKH and applicants. There are no specific regulations for GE products in Indonesia, with KKH processing all GM and GE applications. If an application pertains to GE products, the relevant minister or head of a national institution is notified that the product only requires part of the approval process. The government is working on new regulations for GE products that may streamline or bypass existing approval procedures.

3.3 Recommendations

It is recommended that targeted actions be implemented across key areas to realize the benefits of GM products and accelerate their adoption in Indonesia.

1. Undertake a comprehensive review and overhaul of the existing regulatory framework (Government Regulation No. 21/2005 for GM products). This reform should reduce administrative bottlenecks, remove barriers, streamline and simplify approval processes, and align regulations with international standards. A centralized regulatory body, such as the Biosafety Commission (KKH), should be established to manage all aspects of GM product approval. This approach will streamline interactions, eliminate delays caused by multiple agencies, and accelerate the time-to-market for GM products. Additionally, it is essential to promote inclusive policymaking processes. The current outdated regulation hinders several technical agencies from adopting the latest agricultural technologies, such as gene editing.

   To address concerns about the lengthy approval process, it is recommended that a centralized dashboard that integrates all relevant indicators be implemented. This dashboard should facilitate real-time monitoring and coordination of data. By providing a single platform for tracking the status and progress of submissions, the dashboard will help reduce delays and enhance coordination among stakeholders.

2. Develop a clear and comprehensive roadmap for GM product adoption. This roadmap should outline the steps for widespread adoption, including timelines for regulatory reforms, public awareness initiatives, and the development of supportive infrastructure. The roadmap will guide stakeholders in coordinating their efforts and achieving common objectives by setting strategic goals and actionable milestones.

3. While some biotechnology products have been approved for use in Indonesia, there is a need for increased government involvement in managing post-commercialization aspects. This includes establishing clear guidelines for monitoring and evaluation, ensuring compliance with safety standards, and providing support for farmers using GM products. A dedicated government body should be tasked with overseeing these activities, ensuring that regulations are effectively implemented and that any emerging issues are addressed promptly.

4. Allocate increased budgetary resources for R&D related to GM technology. Enhanced funding will support cutting-edge research, drive innovation, and facilitate the development of new GM products tailored to local agricultural needs. Investing in R&D will strengthen Indonesia's biotechnology sector and ensure continued advancement in GM product development. Additionally, providing incentives for R&D activities, such as tax deductions for trials and multilocation tests, will further stimulate research efforts. The government should also consider providing necessary support and resources to existing scientists, including those who have transitioned from technical ministries to the National Research and Innovation Agency (BRIN). To foster the adoption of the latest technologies, including gene editing, it is important to endorse advanced methods and promote collaborations with multinational and biotech companies. This strategic partnership will help integrate state-of-the-art technology and accelerate the development of innovative GM solutions.

5. Integrate GE products into the existing regulatory framework. As genome editing technologies evolve, addressing these advancements within the regulatory process is essential. This integration will provide a comprehensive approach to biotechnology regulation, accommodating emerging technologies and fostering a more adaptive regulatory environment.

6. Improving public awareness through targeted strategies is crucial to boosting acceptance and informed decision-making regarding GM products. Educational campaigns should provide factual information about GM products, their benefits, and their safety. This can be done through school programs, public seminars, and online resources that address misconceptions with accessible scientific evidence. Engaging nongovernmental institutions, such as advocacy groups and educational organizations, can further enhance outreach efforts and credibility.

   It is important to note that awareness campaigns are cost-intensive and may require substantial funding. Moreover, these campaigns often need to be restarted from scratch every five years due to personnel changes. Therefore, publishing information online offers a more sustainable solution. By making educational materials readily accessible on the internet, information remains available and can be referenced by the public long after the initial campaign has ended. Transparent communication channels between the government, researchers, and the public, supported by these institutions, will help build trust and keep people informed about GM product approvals, research findings, and safety assessments. Transparent communication channels between the government, researchers, and the public will also help build trust and inform people about GM product approvals, research findings, and safety assessments.

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Chapter IV

Healthcare Sector

Indonesia's healthcare landscape has been undergoing significant transformation to improve the overall quality of healthcare, enhance accessibility, and prioritize preventive care. The National Medium-Term Development Plan (RPJMN) outlines two main health-related goals: accelerating improvements in community nutrition and strengthening the healthcare system, including medicine and food control.

When it comes to community nutrition, stunting is an acute issue in Indonesia. This condition, which affects millions of Indonesian children, impairs both physical and cognitive development, leading to long-term detrimental effects on health and economic productivity. Addressing stunting has become a national priority to ensure a healthier future generation.

A key aspect of Indonesia's healthcare transformation is the emphasis on preventive care, which relies heavily on the availability and accessibility of medical devices. Enhancing access to these medical devices is crucial for improving diagnostic and treatment capabilities nationwide, especially in remote and underserved areas. This would reduce health disparities, ensure timely medical interventions, and ultimately elevate the standard of healthcare services nationwide. These efforts are integral to achieving sustainable health outcomes and fostering a resilient healthcare system in Indonesia.

Therefore, this sector overview report will focus on two important aspects of Indonesia's healthcare transformation. First, government initiatives related to nutrition interventions for stunting prevention and eradication. Second, the role of innovative medical devices in improving health accessibility and treatment.

1. Nutrition Interventions for Stunting

Key Highlights

- Stunting refers to linear growth retardation in early childhood as a result of multiple factors. In Indonesia, stunting is primarily linked to nonexclusive breastfeeding during the first six months, low household socioeconomic status, premature birth, short birth length, and low maternal height and education.
- The government aims to reduce the prevalence of stunting to 14% by 2024. However, while stunting rates have gradually and consistently declined since 2013, the Ministry of Health's Indonesia Health Survey shows that the current prevalence is 21.5%, reflecting only a slight decrease of 0.1% from 2022.
- Under the National Strategy for Stunting Reduction Acceleration (StraNas Stunting), Indonesia implements two types of interventions: specific interventions, which target the direct causes of stunting, and sensitive interventions, which address indirect causes.
- Considerable progress in reducing stunting has been made over the last decade as a result of various initiatives and strategies. However, some indicators related to the intermediate targets of specific and sensitive interventions have not been optimally achieved.
- Considering the achievements and challenges of StraNas Stunting, Indonesia's new president has proposed a "free meals" program as a solution. Similar to school feeding programs (SFP) in India and Brazil, this program has not been included in the global

agenda to address stunting, as it targets children outside the “first 1,000 days” window. However, it could have long-term benefits by improving intergenerational nutrition.

- Tackling stunting in Indonesia may be less about increasing spending and more about improving the efficiency of resource allocation and use. From 2015-2018, most spending was focused on nutrition-sensitive interventions (indirect interventions) instead of nutrition-specific interventions (direct interventions). Addressing inefficiencies in resource allocation is crucial for planning future stunting prevention and eradication programs.
- To effectively combat stunting in Indonesia, the government should consider prioritizing the inclusion of animal-sourced protein in free meals programs, alongside high-protein medication under the Processed Food for Special Medical Needs (PKMK) or Food for Special Medical Purposes (FSMP). These foods are formulated to meet specific nutritional needs due to certain health conditions and are widely used in various countries as part of their nutrition strategies.
- Programs should focus on targeting pregnant mothers and children under five. Additionally, a clear mechanism for private sector collaboration and robust monitoring and evaluation tools are essential to ensure the program's efficiency and scalability, thereby enhancing its impact on stunting reduction.

1.1 Brief Introduction to Stunting

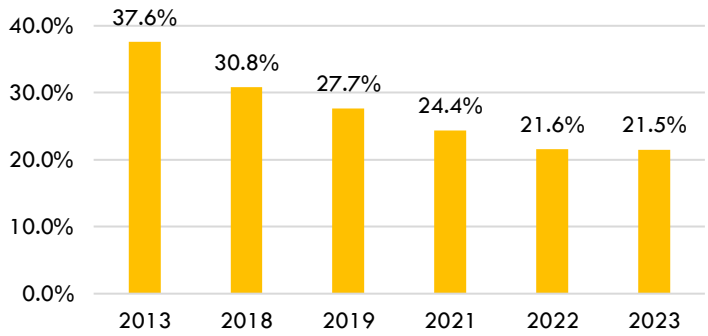
Stunting refers to linear growth retardation in the early years of life, which prevents individuals from reaching the height suggested by their genetic potential (Bhutta et al., 2020; UNICEF et al., 2023; Wahyuningsih et al., 2022). This results from multidimensional determinants. According to WHO (2020), stunting is caused by the combined effects of poor nutrition during pregnancy and early childhood, repeated infections, and inadequate psychosocial stimulation. In Indonesia, evidence suggests that stunting is primarily due to nonexclusive breastfeeding in the first six months, low household socio-economic status, premature birth, short birth length, and low maternal height and education (Beal et al., 2018).

Children suffering from stunting may experience both short-term and long-term consequences. They begin their lives at a marked disadvantage, with effects that continue into adulthood. Stunted children may never reach their full potential height, suffer from poor cognitive development, which leads to reduced learning capacity, and even face increased risks of mortality and morbidity (Titaley et al., 2013; WHO, 2020). The physical and neurocognitive damage caused by stunting is often irreversible, posing a major obstacle to human development. This can lead to a decline in school performance, work capacity, and work productivity, resulting in lower income (McGovern et al., 2017; Soliman et al., 2021; Suryana & Azis, 2023; Watson et al., 2019).

According to a report from UNICEF, WHO, and the World Bank (2023), an estimated 22.3% of 148.1 million children under five globally suffered from stunting in 2022. The majority of stunted children are from Asia and Africa, with 52% and 43% of the total, respectively. In Indonesia, stunting prevalence has decreased over the last decade, dropping from 37.6% in 2013 to 21.5% in 2023. However, this progress falls short of the National Medium Term Development Plan (RPJMN) 2020-2024 goal of reducing stunting prevalence to 14% by 2024.

Most stunting cases in Indonesia are found in children aged 24-35 months. Out of the country's 38 provinces, 15 have stunting prevalence rates above the national average, with Central Papua having the highest prevalence at 39.4%, East Nusa Tenggara at 37.9%, and Highland Papua at 37.3% (Ministry of Health, 2024).

Figure 1: Stunting Prevalence in Indonesia (2013-2023)

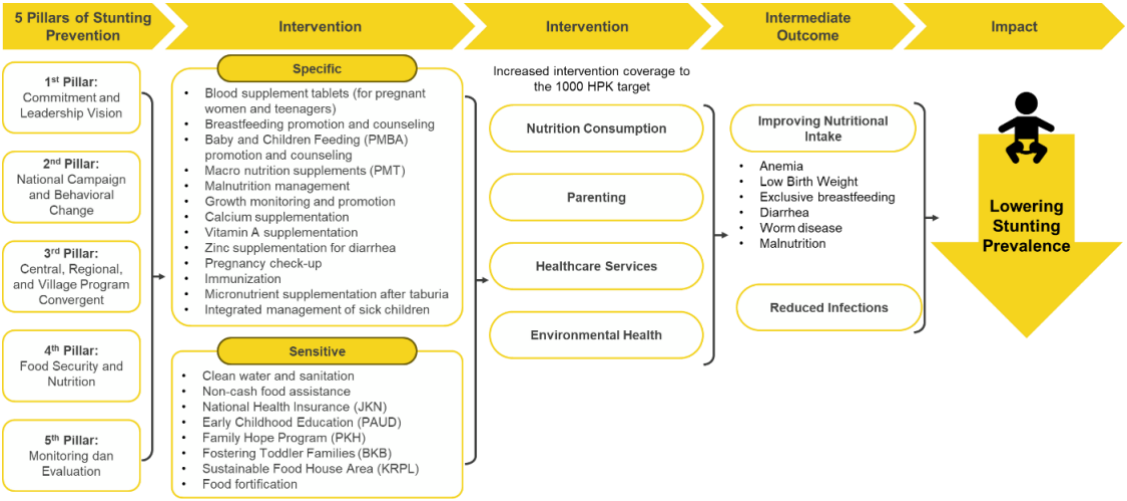


Source: Basic Health Research (Riskesdas) 2013 & 2018, Indonesia Nutritional Status Survey (SSGI) 2019-2022, Indonesia Health Survey (SKI) 2023 (Ministry of Health, 2024)

1.2 Policy Instruments to Improve Nutrition

To cultivate healthy, intelligent, and productive citizens and achieve sustainable development goals, Indonesia introduced Presidential Regulation No. 72/2021 on Stunting Reduction Acceleration. This regulation is implemented through the collaboration of ministries/agencies, provincial governments, district/city governments, village governments, and other stakeholders under the National Strategy for Stunting Reduction Acceleration (StraNas Stunting). To prevent and eradicate stunting, Indonesia has two types of interventions: (1) Specific intervention, which addresses the direct causes of stunting (nutrition intake and health conditions), and (2) Sensitive intervention, which addresses the indirect causes of stunting (food security, social environment, health environment, residential environment, etc.).

Figure 2: National Strategy for Stunting Reduction Acceleration Framework



Source: Stunting Prevention Secretariat (2019)

The National Population and Family Planning Board (BKKBN), as the chair of the Stunting Reduction Acceleration Team, is responsible for implementing StratNas Stunting.[31] BKKBN is employing three approaches: (1) an integrated nutrition intervention approach, (2) a multi-sector and stakeholder approach, and (3) a family at-risk of stunting-based approach. These approaches are required to be aligned with each other, as addressing stunting requires a complex and multisectoral effort (World Bank, 2020).

Considerable progress has been made over the past decade in reducing stunting prevalence, with notable achievements in various initiatives and strategies. According to BKKBN (2023), most of the specific and sensitive intervention intermediate targets were reached in 2022. However, some indicators have yet to be fully met. For example, the goal of achieving exclusive breastfeeding for infants younger than six months reached 66.4%, short of the 2022 target of 70%. Several challenges remain, including (1) budgetary commitments; (2) limited understanding of convergence at various levels; (3) exclusion of stunting from the priority programs in regional medium-term development and strategic plans; (4) scattered data; (5) unavailability of data; (6) inadequate capacity of Family Support Teams (TPK); (7) inadequate dissemination of rules/regulations from the central level to the provincial, district and village levels; (8) limited engagement of universities, partners, faith-based organizations, and community organizations with regional governments; and (9) lack of clear guidelines on monitoring and evaluation of convergence (BKKBN, 2023). Moreover, while overall access to the nutrition interventions prioritized in the StraNas Stunting has improved in the last decade, national averages mask wide disparities by socioeconomic status (World Bank, 2020).

Against this backdrop, Indonesia's new president, President Prabowo Subianto, has proposed a "free meals" program as a solution to eradicate stunting. This program aims to provide lunch to pre-school, elementary school, middle school, high school, and boarding school students. Nutritional assistance will also be provided to pregnant mothers and children under five. This program is expected to reach more than 80 million beneficiaries by 2029, based on the president's election campaign plans;[32] however, no additional details have been released. The program has since undergone rebranding, with a stronger focus on addressing child malnourishment and tailoring solutions to the different "typologies and conditions" of each region (Sulaiman, 2024; The Jakarta Post, 2024).

Countries such as Brazil and India, which have two of the most comprehensive universal free-of-charge programs, have shown the benefits of school feeding programs (SFPs) (Bandoni et al., 2024). SFPs have garnered increasing attention, as research has shown their positive impact on healthy diets, academic performance, and school enrollment. Although SFPs are not included in the global agenda to address stunting—since they target children outside the "first 1,000 days" window—they can have long-term benefits through intergenerational nutrition (Chakrabarti et al., 2021).

A more effective free meals program should incorporate high-protein supplements as a proactive measure. This should be separated from the high-protein, doctor-prescribed supplements that are given specifically to children who are stunted. However, there are

[31] This is enabled by BKKBN Regulation No. 12/2021 on the National Action Plan for Stunting Reduction Acceleration (RAN-PASTI) 2021-2024.
[32] *Visi, Misi Dan Program Calon Presiden Dan Wakil Presiden 2024-2029: H. Prabowo Subianto & Gibran Rakabuming Raka*, 2023

concerns regarding the quality of school meals. In India, for example, agreed nutritional standards often fall short of providing one-third of a child's recommended dietary allowance (RDA), and many school kitchens do not even fully comply with the established guidelines (Nakao & Tsuno, 2018). Additionally, SFPs are generally considered high-cost programs due to the substantial financial investment required for food procurement, infrastructure, and administrative needs. As these concerns prevail, the free meals program must involve various monitoring and evaluation tools to ensure the program's effectiveness and efficiency in eradicating stunting in Indonesia.

The most critical period for addressing stunting is the first 1,000 days of life, or *Hari Pertama Kehidupan* (HPK), which consists of 270 days in-utero and 730 days (2 years) of early childhood. Nutrition during this period has both immediate and long-term health implications. These effects are generally difficult to reverse and can extend across generations. Thus, early nutrition is increasingly recognized as a key driver and marker of development. The effects of early nutrition are profound and long-lasting, creating a cumulative effect that underscores the importance of "getting it right." Investing in early nutrition is therefore considered one of the most effective returns on investment for society (Saavedra & Dattilo, 2022).

1.3 Best Practices from Other Countries

1.3.1 Effective Programs to Prevent and Eradicate Stunting

Programs that combine nutrition-specific and nutrition-sensitive interventions, particularly those with robust health access and safety net components, appear to be most effective in reducing stunting in lower-middle-income countries (LMICs) (Hossain et al., 2017). Bhutta et al. (2020) found that health and nutrition account for 40% of the reduction in stunting through a blend of these strategies.

Programs combining specific and sensitive interventions implemented in the last five years and others in various LMICs were evaluated by comparing the estimated average annual rate of reduction (AARR). The study found seven effective programs out of 14, with a median AARR of at least 3% (Hossain et al., 2017).

Table 1: Nutrition Intervention Programs in Low- and Middle-Income Countries

Country	Program name	Study design	Study population and setting	Time period	Program components	AARR (%)
Bangladesh	Strengthening household ability to respond to development opportunities (Shouhardo)	Cross-sectional surveys	Children 6-24 months, poorest household	2006-2010	Nutrition education and counselling; GMP; Vit A and IFS; immunization, HFP; access to local health facilities; sanitation women empowerment; PFSA; SSN	4.5

Country	Program name	Study design	Study population and setting	Time period	Program components	AARR (%)
Nepal	The vita-mix-it distribution program	Pre-post design	Bhutanese children 6-59 months, Nepal refugee camps	2007-2010	Nutrition education and counselling, MNP; FS; GMP; immunization; deworming	4.0
Vietnam	National childhood malnutrition program	Cross-sectional surveys	Children 0-59 months	1990-2004	Immunization; IMCI; PFSA; HFP; WASH	4.3
Brazil	National health and nutrition program	Cross-sectional surveys	Children 0-59 months, poor households	1986-2006	PFSA; SSN; IMCI; parental education; WASH; HFP	8.4
Peru	The good start in life program	Before-and-after program	Rural poor children 0-36 months	2000-2004	Nutrition education and counselling; immunization; GMP; FS and FF; SSN; women empowerment	4.3
Niger	The child survival program	Cross-sectional surveys	Children 0-59 months, poor households	1998-2009	Malaria prevention and treatment	3.3
Sub-Saharan Africa	Millenium village	Cross-sectional surveys	Rural children 0-24 months, poor households	2006-2009	Nutrition education and counselling; GMP; IYCF; Vit A and IFS; MNP; immunization; IMCI; PFSA; access to local healthcare; WASH; telemedicine; malaria prevention and treatment; SSN	6.7

Source: Hossain et al. (2017)

Notes: AARR (Average Annual Rate of Reduction); GMP (Growth Monitoring and Promotion); FF (Food Fortifications); FS (Food Supplementation); HFP (Health and Family Planning Services); IYCF (Infant and Young Child Feeding); MNP (Multiple Micronutrient Powder); PFSA (Poverty and Food Security Alleviation; SSN (Social Safety Net); Vit A and IFS (Vitamin A and Iron-Folic Acid Supplementation); WASH (Water, Sanitation, and Hygiene).

In addition to combining specific and sensitive interventions, effective programs included nutrition education and counseling; immunization; growth monitoring and promotion (GMP);

water, sanitation, and hygiene (WASH); and social safety nets. Programs with strong health access and safety net components were found to be most effective in reducing stunting in LMICs. Additionally, some countries have implemented "free meals" programs, such as India's Midday Meal Program and Brazil's School Free Meal Program.

India's Midday Meal Program is one of the world's largest free meals programs, reaching over 100 million children nationwide. This program targets students aged 5-12 and children aged 6-14 who don't attend school (Nakao & Tsuno, 2018). It aims to improve students' nutritional status and promote the universalization of elementary education, with significant demonstrated effects. This program requires a substantial commitment from the government of India, as it is the second largest initiative of the Ministry of Education, accounting for 12% of the ministry's budget allocation in 2021-2022 (Centre for Policy Research, 2022).

Brazil's School Free Meal Program (PNAE) not only provides meals but also integrates nutritional education and local agricultural products, which enhances its impact on children's health. PNAE promotes intersectionality in the food system by coordinating actions to guarantee access to healthy food and support family farming. At the school level, the PNAE, in combination with other programs such as the Food Acquisition Program (PAA), has progressively improved the availability and consumption of fruits and vegetables. PNAE is managed by the National Fund for Development of Education (FNDE), an entity linked to the Ministry of Education. However, there is limited evidence of the specific impacts of school feeding programs on schoolchildren's diets, nutrition, educational achievement, and the food security and income of farmer families (Sidaner et al., 2013).

1.3.2 Lessons Learned

Stunting is a significant public health challenge that affects children's physical and cognitive development, leading to long-term detrimental effects on their well-being. Stunting prevention and eradication efforts focus on the first 1,000 days of life, including the period of conception through a child's second birthday. This period is critical for influencing children's health and cognitive development, as 92% of brain development occurs before the age of five, making this age especially vulnerable to nutrient insufficiency (Soliman et al., 2021). Generally, nutrition-specific and nutrition-sensitive interventions are necessary to reduce stunting, and these approaches have been widely implemented across the globe in conjunction with other programs.

One of the most debated stunting reduction proposals in Indonesia is the new government's planned "free meals" program. Critics argue that this program may place a burden on the state budget while having a limited impact on stunting eradication and reduction. This program targets students rather than pregnant mothers and young children within the first 1,000 days of life. Because the target students have already passed the critical window for addressing stunting, the program may not directly mitigate the effects of stunting. However, such food disbursement programs could be adapted to incorporate nutrients needed for pregnant mothers and children. According to an interview with an expert in pediatric nutrition and metabolic diseases, the proposed free meals program would only be effective if stunting is first addressed in the critical period. The expert predicted that the program would fail to prevent

and eradicate stunting if it is not specifically targeted at pregnant mothers and children under five.

Several approaches exist to address the specific micronutrient needs of children, including supplements and targeted supplementary foods (Lentz & Barrett, 2013). Studies and interviews with experts indicate that providing high-protein foods as part of dietary treatment is effective in reducing the risk of stunting (Fjeld et al., 1989; Headey et al., 2018; Kabir et al., 1998). Stunting in early childhood is associated with the lack of essential amino acids found in animal-sourced food such as milk, eggs, and chicken. Eating animal-sourced food once a day can reduce the risk of stunting by 3.7% (Headey et al., 2018). Thus, promoting the consumption of animal-sourced foods among children under five and pregnant mothers can be a relatively simple and effective approach to prevent and eradicate stunting. This strategy, along with other programs, was implemented in 14 cities/regencies in Indonesia from 2021-2022, resulting in a significant stunting prevention rate of 82% and a stunting reduction rate of 42.3%. However, specialized care and prescriptions for stunted children are still required.

Indonesia has specially processed food for nutritional needs, regulated by the National Agency of Drug and Food Control (BPOM) Regulation No. 1 /2018, Regulation No. 24/2019, and Regulation No. 24/2020 Processed Food for Special Nutritional Needs (PKGK) is formulated to meet specific nutritional needs due to certain physical or physiological conditions or diseases. It consists of Processed Food for Special Diets (PDK/FSDU) and Processed Food for Special Medical Needs (FSMP/PKMK).

PKMK is a key component of nutritional management for stunting, as outlined in the Ministry of Health's National Guidelines for Medical Services for the Management of Stunting. PKMK provides a comprehensive mix of essential nutrients crucial for children's growth and development, specifically for stunted children. Compared to general food, PKMK is usually formulated to be rich in essential nutrients, such as proteins, to address specific deficiencies and medical needs. PKMK can be used as an alternative treatment for stunted children, either fully or partially (orally or enterally), in combination with balanced meals that prioritize animal protein sources. PKMK is known as Food for Special Medical Purposes (FSMP) in other countries, where it is also widely used. FSMP is referred to as medical foods in the United States and Enteral Nutrition by healthcare professionals in Brazil.

While government spending on nutrition is more than adequate to cover a comprehensive package of nutrition interventions, addressing stunting in Indonesia may be less about "spending more" and instead about more efficient allocation of resources (World Bank, 2020). Between 2015-2018, central government spending on stunting remained relatively stable. However, the majority of this spending was directed toward nutrition-sensitive interventions (indirect intervention), such as subsidized rice, clean water, and the Family Hope Program (PKH).

Only a small portion of the spending was allocated to nutrition-specific interventions (direct intervention). In 2018, only 6% and 3.4% of stunting spending from the central government was used for immunization and supplementary feeding (PMT), respectively, which already represent the largest spending on nutrition-specific interventions (World Bank, 2020). This highlights the need for improved efficiency in spending allocation when designing programs to prevent and eradicate stunting.

1.4 Ideal Role for the Private Sector

The government has the mandate and authority to take the lead in anticipating, preventing, and eradicating stunting in Indonesia. However, the stunting prevalence in Indonesia only declined by 0.1% in 2023, raising concerns over the effectiveness of the government's programs. Support from other parties, such as the private sector, is essential in finding effective solutions to the problem. The private sector can contribute to stunting prevention and eradication through product procurement, program assistance, aid, and even through corporate social responsibility programs.

In an interview, a multinational medical device and healthcare company highlighted the private sector's capacity to support government initiatives by providing essential products. One such product, which can be categorized as PKMK with a protein ratio of 12%—slightly higher than WHO's recommendation of 10%—can be delivered to children suffering from stunting. The company's cost-effectiveness analysis found significant increases in weight and height among stunted children within two weeks of consuming the product.

However, the mechanism for multinational companies to participate in the government's stunting prevention and eradication program remains unclear. While the role of the private sector in medicine procurement is regulated through FORNAS (National Formularium) and e-Catalog, similar regulations for stunting and nutritional food are not yet in place. Currently, a BPOM regulation controls only the registration of products to verify their nutritional value and claims. There is a need for a clear mechanism for procurement and budgetary allocation, as products like these could serve as alternatives for combating stunting.

1.5 Recommendations

This study offers several recommendations for the Indonesian government to enhance the effectiveness of its stunting prevention and eradication programs.

A. Ensure the Nutritional Value of Free Meals Program	
Issues	Recommendations
• Stunting in early childhood is associated with a lack of essential amino acids, which are found in animal-sourced food. Studies show that consuming animal-sourced food once a day can reduce the risk of stunting by 3.7%. • The specifics of the free meals program have not yet been announced, but there are concerns about its nutritional quality.	1. Ensure the free meals program contains a high protein ratio from animal-sourced food (such as milk, egg, chicken, fish, etc.) 2. Include high-protein medication for stunted children under PKMK/FSMP in reimbursement and funding programs.

B. Evaluate the Free Meals Program's Beneficiaries	
Issues	Recommendations
• The root cause of stunting is nutritional deficiencies in pregnant mothers and children under five. • The free meals program initially targets pre-school, elementary school, middle school, high school, and boarding school students.	1. The free meals program should focus more on children under five up to 10 years old and pregnant mothers as its beneficiaries. 2. Once the root issues are addressed, the scope of the free meal program can be expanded to include older students and additional groups.
C. Establish a Clear Mechanism for Private Sector Involvement	
Issues	Recommendations
• The mechanism for multinational companies to participate in the government's stunting prevention and eradication program is unclear. • Regulations for procurement of stunting and nutritional food have not yet been established.	1. Include specific scientific guidelines for procurement, budget allocation, and program collaboration, similar to existing regulations for medicine through FORNAS, e-Catalog and other government financing schemes. This should ensure sufficient supply and allow for multiple providers. 2. Leverage the private sector's capacity to supply high-protein nutritional products such as PKMK/FSMP.
D. Develop Monitoring and Evaluation Tools	
Issues	Recommendation
• Free meal programs are widely acknowledged as a high-cost initiatives. In 2025, IDR 71 trillion will be allocated for free meals program. • Implementing and maintaining the program demands significant financial resources for food procurement, infrastructure, and administrative expenses.	1. Develop monitoring and evaluating tools to ensure the free meals program's effectiveness and efficiency in reducing stunting.

2. Innovative Medical Devices

Key Highlights

- Indonesia's healthcare landscape is undergoing a significant transformation aimed at improving the overall quality of healthcare, enhancing accessibility, and prioritizing preventive care. Recognizing the importance of prevention over treatment, the government is investing heavily in programs that promote healthy lifestyles, disease prevention, and early diagnosis.
- The domestic market for medical devices and equipment in Indonesia was estimated to be worth USD 1,433 million (IDR 22.93 trillion)[33] in 2023. The government is focusing on building healthcare resilience, including enhancing local manufacturing capabilities to reduce reliance on imports during health crises. It encourages industry players to adopt digital transformation from production to distribution to improve industry performance.
- However, the importation of medical devices in Indonesia is currently hampered by the local content requirement (LCR) policy, which has inadvertently limited access to cutting-edge medical technology.
- While the LCR policy aims to stimulate local manufacturing, Indonesia's medical device industry is not yet mature enough to fully meet these requirements. In addition, LCR policies that adopt a one-size-fits-all approach, imposing a uniform criterion across all industries and medical device products with varying characteristics, are not optimal in the creation of a medical device ecosystem. In the context of healthcare, Ministry of Industry Regulation No. 31/2022 applies a uniform LCR requirement to wide-ranging products, from surgical masks to MRI, which have a very different n for input materials that can be sourced domestically.
- The LCR policy's consequence is a restriction on the import of advanced medical technologies, even though the production of high-tech medical devices is highly concentrated in a few countries—the United States, Germany, China, Japan, and Ireland, which collectively supply almost 60% of the global medical device market.
- Indonesia is not yet equipped to produce high-tech medical devices due to the need for massive investments, technology, knowledge transfer, and substantial improvements in labor skills. Manufacturing a high-tech medical device often requires machinery and equipment that are not available domestically, which means local manufacturers often produce these devices at a higher cost than international suppliers. Moreover, Indonesia's healthcare system is deprived of the latest innovations, compromising the quality of care.
- Developing the medical device industry and boosting its competitiveness requires a more structural approach that addresses productivity bottlenecks. Instead of relying on the LCR policy, this strategy should consider focusing on creating a competitive, business-friendly environment that encourages innovation and productivity.
- Indonesia is in the early stages of developing a high-tech medical device industry. To do this, the Indonesian government should take several key actions, including: formulating a long-term roadmap and strategy, revising the LCR policy, investing in

[33] USD 1 = IDR 16,000

innovation and R&D, streamlining regulatory pathways, strengthening intellectual property protections, encouraging public-private partnerships, supporting market expansion, and emphasizing quality and safety.

2.1 Local Content Requirements for Medical Devices

Indonesia's healthcare landscape is undergoing a structural transformation, with its national health strategy emphasizing improving overall healthcare quality, enhancing accessibility, and prioritizing preventive care (Ministry of Health, 2023). This shift is essential for addressing the rising prevalence of non-communicable diseases (NCDs), such as diabetes, cardiovascular diseases, and cancer, which pose significant public health challenges in the country. However, this focus on preventive care over curative approaches requires the availability of advanced medical devices for early diagnosis, monitoring, and disease management.

To support this shift, diagnostic equipment needs to be widely accessible in hospitals and healthcare facilities throughout the country. Indonesia currently has 3,042 hospitals, around 63% of which are privately managed (Statistics, 2022), and 10,374 public Health Community Centers (Puskesmas) as of 2022, providing comprehensive primary healthcare services and vaccinations. Recognizing the importance of prevention over treatment, the government needs to significantly increase the supply of medical devices.

The domestic market for medical devices and equipment was estimated to be worth USD 1,433 million in 2023 (Indonesian Medical Device Producers Association, US Department of Commerce TradeStats Express, and Global Trade Atlas on Connect Trade Data, 2024). However, the LCR policy currently restricts the import of medical devices. This policy, aimed at boosting local manufacturing and reducing dependency on imports, has inadvertently limited Indonesia's access to cutting-edge medical technology. Many advanced medical devices, such as PET scans and CT scans, which are needed for effective preventive care, are not produced locally and are thus subject to import restrictions.

PET scans, for instance, can play a significant role in preventive care by enabling the early detection and monitoring of various diseases, including cancers, cardiovascular diseases, and neurological disorders. By detecting cancer early, PET scanners enable healthcare providers to formulate effective treatment plans, increasing the chances of success and reducing the burden of advanced disease treatment. Moreover, PET scans can monitor the effectiveness of ongoing treatments, helping to adjust therapies as needed and avoid unnecessary procedures. However, import restrictions can limit access to such high-tech products. Without local production, Indonesia's healthcare system may face delays and increased costs when acquiring these devices, impacting the overall quality of care.

Indonesia's total imports of medical devices grew from USD 2,183 million in 2020 to USD 2,633 million in 2021 (US Department of Commerce Global Trade Atlas, 2024). However, they decreased to USD 1.865 billion in 2022 following the implementation of the LCR policy, which restricted government purchases of over 5,400 imported medical device products under 79 categories.

The government's healthcare transformation strategy also includes a focus on digitalization. The roadmap for this digital transformation has three priorities: the integration and

development of health data systems, the integration and development of health service application systems, and the development of the health technology ecosystem (Ministry of Health, 2023). This digital transformation is intended to improve the performance of the healthcare industry and make healthcare services more accessible and efficient.

Moreover, the government is heavily investing in healthcare resiliency, a critical element for future pandemic preparedness. This includes boosting local manufacturing capabilities to reduce reliance on imports during health crises. The government encourages medical device industry players to digitalize their processes, from production to distribution, to improve industry performance.

These changes are expected to improve overall health outcomes and make healthcare services more accessible and affordable. However, the LCR policy presents a challenge to the import of medical devices, requiring further review and policy reforms. Balancing the goals of fostering local industry and ensuring the availability of necessary medical technologies is crucial for improving inclusive well-being in the future.

2.2 Implementation of Local Content Requirements for Medical Devices

The LCR policy for medical devices in Indonesia aims to bolster domestic production and reduce import dependency. However, this policy may be ineffective and potentially harmful to the goal of increasing the competitiveness of Indonesia's domestic medical device industry. It could also lead to higher costs for consumers and undermine Indonesia's Health Transformation strategy, particularly the first pillar, which emphasizes the importance of preventive care. To strengthen Indonesia's capacity for preventive healthcare, high-tech medical devices that cannot be produced locally, such as CT scanners and MRI machines, are highly needed.

A challenge in the implementation of LCR policies is the dichotomy in medical device procurement in Indonesia, where devices are classified into AKD (*alat kesehatan dalam negeri*/locally produced medical devices) and AKL (*alat kesehatan luar negeri*/imported medical devices) based on their local content. Under the current regulatory framework, medical devices classified as AKL cannot apply for an LCR certificate. Considering that most high-tech medical devices fall under the AKL category, this classification, along with the LCR policy, hinders high-tech medical devices from entering the Indonesian market. Thus, these policies might be counterproductive to the goals of Indonesia's Health Transformation, particularly the first pillar on preventive care.

Table 2: Indonesia's LCR Policies Regarding the Healthcare Sector

No.	Year	Name	Summary
1.	2016	Presidential Regulation No. 6/2016	Requires the Ministry of Health to prioritize local products and devices during government procurement. It also requires the ministry to monitor LCR implementation in the industry.
2.	2017	Ministry of Health Regulation No. 7/2017	An action plan for the Ministry of Health to develop the industry into an exporter of

No.	Year	Name	Summary
			pharmaceutical raw materials. The plan reinforces Presidential Regulation No. 6/2016.
3.	2021	Presidential Regulation No. 12/2021	Requires government agencies to prioritize LCR-compliant and MSME (micro, small, and medium enterprises) products in government procurement.
4.	2022	Ministry of Industry Regulation No. 31/2022	Establishes LCR requirements for medical equipment/devices, with 80% for production and 20% for R&D.
5.	2022	Presidential Regulation No. 2/2022	Mandates the creation of a government-run electronic catalogue that prioritizes LCR-compliant and MSME products, to be promoted by relevant government ministries.

Source: CSIS, 2023

The LCR policy mandates that a certain percentage of components in medical devices must be sourced locally. While the intent is to stimulate local manufacturing, Indonesia's medical device industry is not yet mature enough to meet these requirements. In addition, LCR policies adopt a one-size-fits-all approach, imposing a uniform criterion for all industries and medical device products with varying characteristics (Fiscal Policy Agency, Ministry of Finance, 2023).

One of the main consequences of the LCR policy is the restriction on importing advanced medical technologies. Global leaders in medical technology produce cutting-edge diagnostic and therapeutic devices with years of expertise and advanced manufacturing capabilities, leading to a high concentration of production in a few countries. The five largest producers—United States, Germany, China, Japan, and Ireland—account for almost 60% of the global medical device supply (Rayming, 2022).

Indonesia is not well-equipped to produce high-tech medical devices, as this requires massive investments, technology and knowledge transfer, and substantial improvement in labor skills (CSIS, 2023). By restricting imports of these devices, Indonesia is depriving its healthcare system of the latest innovations, thereby compromising the quality of care. This is particularly detrimental to preventive care, which relies heavily on advanced diagnostic tools for early detection and management of diseases.

The LCR policy also increases costs for healthcare providers and consumers. Local manufacturers, lacking economies of scale and advanced technologies, often produce medical devices at a higher cost than their international counterparts. In addition, producing high-tech medical devices requires massive investment, specialized knowledge, and advanced manufacturing technologies, making their production feasible in only a few countries. For instance, more than 80% of global MRI, PET, and CT apparatus are produced by just five countries (Trademap, 2024). In addition, high-tech medical devices are not mass-produced, which means only a few countries can manufacture them economically. Given that Indonesia currently cannot produce high-tech medical devices, implementing the LCR policy may lead

to unnecessary costs for such products. These costs are typically passed on to healthcare providers and, ultimately, to patients, making medical care more expensive.

This policy exacerbates financial barriers to accessing quality healthcare in a country where healthcare affordability is already a challenge. Research by Ing and Zhang (2023) found that while the LCR imposition increases the average local content among compliant firms, it also raises the costs of domestic inputs and leads to a decline in local content among non-compliant firms. This results in a slightly lower aggregate local content, suggesting that LCR policies may have unintended consequences when aiming to boost local content.

Furthermore, the increased costs and reduced availability of advanced medical devices can lead to inefficiencies and reduced effectiveness in healthcare delivery. Healthcare providers may have to rely on outdated or substandard equipment, leading to misdiagnoses, delayed treatments, and poorer health outcomes. This undermines the very goals of Indonesia's Health Transformation strategy, which aims to improve healthcare quality, accessibility, and preventive care.

In terms of consumer welfare, the LCR policy can have dire consequences. The delayed availability of advanced medical devices means that patients may not receive the best care when needed. This can result in prolonged suffering, increased disease burden, and higher long-term healthcare costs due to complications and chronic conditions that could have been managed more effectively with better technology.

2.3 Best Practices from Other Countries

2.3.1 Industrial Policies Implemented for High-Tech Medical Devices

The medical devices industry is a critical sector within healthcare, and the role of the government in its development is paramount. This is evident in the strategies adopted by China, the United States, and EU countries.

The Chinese government's efforts have significantly grown the country's medical device industry. In 2021, China held 20% of the medical device market share, second only to the United States (MDIC, 2021). The government's policies have fostered innovation in the industry, with more than five Chinese medical technology (MedTech) companies obtaining the FDA's breakthrough designation, which helps expedite the development, assessment, and review of novel medical devices (MedTech Europe, 2023). During the initial phase of its industrial policy reform between the 1970s and the 1990s, China implemented the "open door policy." This encouraged more foreign investment and reduced import barriers, including local content requirements. This strategy aimed to facilitate knowledge and technology transfer from foreign companies to domestic producers.

Besides China, several other countries have also adopted various strategies to enhance the competitiveness of their high-tech medical device industries. The United States is home to one of the world's most advanced and competitive medical device industries. The US government plays a crucial role in fostering this environment through robust regulatory frameworks, strong intellectual property protections, and substantial funding for R&D. For example, the National Institutes of Health is the world's largest public funder of biomedical research (NIH, n.d.). In

fiscal year 2022, NIH invested most of its USD 45 billion budget to research to enhance life and reduce illness and disability (NIH, n.d.).

Furthermore, strong intellectual property protections are a cornerstone of the US medical devices industry. The US government provides comprehensive patent laws and enforcement mechanisms that safeguard the innovations of medical device companies. This encourages investment in R&D, as companies are assured that their inventions will be protected from infringement. In terms of regulatory framework, the US Food and Drug Administration (FDA) is renowned for its rigorous regulatory standards, ensuring medical device safety and efficacy (FDA, n.d.). Although the FDA's regulations are stringent, they are also adaptive, incorporating mechanisms such as the Breakthrough Devices Program and the 510(k) premarket notification process. These pathways expedite the development and approval of innovative devices, particularly those that offer significant clinical benefits.

In the European Union (EU), industrial policy emphasizes harmonized regulations, collaborative networks, and a focus on quality and safety. The EU has implemented a harmonized regulatory framework through the Medical Device Regulation (MDR) and the In Vitro Diagnostic Regulation (IVDR) (European Union, 2017). These regulations ensure a consistent approach to medical devices' safety, efficacy, and quality across all member states. The European Medicines Agency (EMA) and national competent authorities oversee the implementation of these regulations, providing a clear and predictable pathway for device approval (EMA, 2023).

In contrast, Indonesia implements Ministry of Industry Regulation No. 31/2022 (MoI 31/2022), which sets out the LCR policy across various commodities, including medical devices. MoI 31/2022 uses a one-size-fits-all approach that aims to substitute imported products with locally produced alternatives. However, medical devices vary in terms of their nature and the domestic capacity to produce them. In addition, Indonesia does not differentiate the application of LCR for medical devices based on medical needs. Meanwhile, the EU does not impose such requirements, focusing instead on enhancing the competitiveness of its medical device industry without compromising the supply of essential medical devices.

Furthermore, the European Commission supports numerous collaborative networks and consortia that bring together researchers, industry stakeholders, and healthcare providers (European Commission, 2023). These networks facilitate the sharing of knowledge, resources, and best practices, promoting innovation and addressing common challenges. The EU also places a strong emphasis on the quality and safety of medical devices. The MDR and IVDR regulations include stringent requirements for clinical evaluation, post-market surveillance, and traceability (BSI, n.d.). These measures ensure that medical devices meet high-performance standards and continue to provide safe and effective outcomes throughout their lifecycle.

2.3.2 Lessons Learned

Based on several best practices from various countries, developing the medical device industry and boosting its competitiveness requires a structural approach that addresses productivity bottlenecks. Observing countries that have successfully developed their medical

device industries, local content requirements were rarely used. Their strategies focused on creating a competitive, business-friendly environment that spurred innovation and productivity. One central lesson that can be adopted in Indonesia is that the government should not solely rely on LCR policies or mandate the local production of all medical devices.

Industrial policy, which aims to develop certain industries, usually has various stages. The first stage is characterized by producing mass-market or simple products and expanding domestic production capacity. Policy instruments during this stage include trade and investment liberalization to ensure the availability of input materials and capital goods necessary for domestic production. This phase also aims to facilitate the transfer of knowledge and technical know-how to domestic producers and workers. The success of this first stage of industrial development manifests in the rapid growth of domestic industrial production for simple products.

After successfully producing simple products, the next stage of industrial development is to push product competitiveness in the international market. The objective here is to increase production efficiency and reduce costs, which will enhance export competitiveness and expand market share. During this stage, governments will often provide various incentives and support to boost production efficiency, promote exports, and establish a global market presence. In some countries, an export promotion committee is established to identify potential export markets and promote products through diplomacy and international agreements. The success of this second stage will generate significant export revenue, which can be used to support the third stage.

The third stage focuses on being the global market leader for sophisticated products. Thus, during the second and third stages, the government will shift the focus of its industrial policy to the production of more sophisticated products. During this stage, policies will emphasize increasing innovation and R&D activities. Export revenue from the second stage will also be reinvested to support R&D efforts and attempts to develop cutting-edge products. High-tech medical devices are classified as sophisticated products.

As the medical device industry in Indonesia is still relatively underdeveloped, the government should focus its industrial policy on the expansion of domestic production and the transfer of knowledge from global market leaders to domestic producers. This includes trade liberalization to ensure the availability of essential input materials and capital goods, and investment liberalization to enhance the transfer of knowledge and technical expertise. Hence, MoI 31/2022 should be revisited, as it serves as a trade barrier that could hamper domestic production capacity and discourage any potential investment inflows. In addition, the LCR policy could risk reducing the competitiveness of domestic products by increasing production costs or decreasing the quality of end products.

Furthermore, the government could support domestic production capacity by developing a production ecosystem, such as a special economic zone dedicated to medical device manufacturing. Other potential instruments that could be used by the government to boost the medical device industry include incentives and policies aimed at promoting exports of domestically produced medical devices. According to the stages of industrial development, Indonesia's medical device industry is still in the first stage. Thus, the government should focus on achieving the objectives of this stage.

2.4 Recommendations

Examining the approaches of China, the United States, and European countries reveals several best practices that could strengthen the competitiveness of Indonesia's medical devices industry. As Indonesia is in its early stage of high-tech medical device industrial development, the Indonesian government can implement the following actions:

A. Develop a Coherent Long-Term Strategy or Roadmap	
Issue	Recommendations
• Insufficient long-term roadmap and strategy for the medical devices industry.	1. Develop a long-term roadmap for the medical devices industry. 2. Conduct industrial mapping to assess the capacity and availability of resources/inputs to support domestic medical device production. 3. Use this industrial mapping to identify feasible medical devices that can be produced in Indonesia. 4. Based on that identification, shift away from the current one-size-fits-all LCR approach.
B. Create a Coherent and Supportive Regulatory Framework	
Issues	Recommendations
• Regulatory pathways are not streamlined. • The LCR policy is counterproductive to the development of the medical device industry.	1. Relax policies related to AKLs (imported medical devices) to align with the priorities in Indonesia's Health Transformation Pillars, which emphasizes preventive health through advanced screening and use of high-tech medical devices. 2. Implement the LCR policy in stages, based on sector readiness, starting with devices with materials that are readily available in Indonesia. 3. Regularly review and update LCR policies to reflect the latest developments. 4. Develop a detailed Indonesia medical devices dictionary (KFA) to guide LCR policy implementation, listing models and/or types of medical devices that are available in Indonesia and their substitutes. 5. Include various forms of company contributions including BMP (*Bobot Manfaat Perusahaan)* in calculating local content.

	6. Emphasize quality and safety through continuous monitoring and post-market surveillance to maintain high standards over time.
C. Create a Supportive Environment for the Development of Domestic Medical Device Industry	
Issue	Recommendations
• The current environment has not yet adequately supported growth and innovation in the medical device industry.	1. Provide incentives for investment in innovation and R&D, such as direct funding and tax incentives, and the establishment of dedicated research institutions. 2. Encourage collaboration between academia, industry, and healthcare providers to drive innovation. 3. Support market expansion by assisting companies in navigating international regulatory environments, promoting exports, and participating in global trade networks. 4. Promote public-private partnerships to share risks, pool resources, and accelerate the development and commercialization of new medical devices. These partnerships can also help translate research findings into practical applications.

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Chapter V

Information and Communication Technology Sector

Key Highlights

- Indonesia's information and communications technology (ICT) sector is vital to achieving its Vision 2045 goals, emphasizing digital transformation as a core strategy for economic development. The sector has experienced rapid growth, with the digital economy expanding by over 414% from 2017 to 2021 and projected to increase by another 62% from 2021 to 2025. The Indonesian government has outlined a long-term plan, the Indonesia Digital Vision 2045, which focuses on three pillars: digital government, digital economy, and digital society. This vision aims, among other things, to strengthen infrastructure, digital skills, and regulatory frameworks to foster a robust digital ecosystem.
- Developing a solid digital backbone in Indonesia requires significant investments in hardware and infrastructure, including data centers, high-speed internet, and 5G networks. The surge in demand for data centers is driven by the increasing need for digital services, including cloud computing and artificial intelligence (AI); however, this expansion is hampered by high investment costs, regulatory hurdles, and trade barriers for ICT equipment, which create an unfavorable enabling environment. Furthermore, for AI technologies to function effectively, there must be a solid foundation of connectivity and hardware in place, underscoring the necessity of well-established digital infrastructure. Current challenges, including limited fiber optic coverage and high spectrum costs, particularly affect connectivity efforts in rural areas, complicating the realization of a fully operational digital ecosystem.
- Indonesia has opted to issue a circular letter on AI instead of a more stringent regulation.[34] This decision is justified because Indonesia is still in the initial stages of exploring and adopting AI technologies. The government's focus will be on supervision and governance to mitigate potential risks associated with AI utilization. The risk-based approach would differ for each sector depending on each use case, resulting in tailored solutions.
- Indonesia's telecommunication infrastructure also faces significant challenges due to its archipelagic geography, regulatory complexities, and high costs of network deployment. Efforts to improve connectivity include initiatives like the Indonesian Telecommunications and Information Accessibility Agency (Bakti Kominfo) program and the Satellite Satria project, aimed at bridging the digital divide and providing high-speed internet access to remote areas. However, the country's 5G rollout remains limited due to spectrum allocation issues and high spectrum costs, which pose additional barriers to achieving widespread digital inclusion. 5G deployment in Indonesia currently relies on the existing spectrum, which serves LTE (4G) and 2.3 GHz. For 5G to function optimally across various use cases, a combination of low-, mid-, and high-band spectrum is essential.[35] The government is set to auction all spectrum bands in early 2025: the low band at 700 MHz, the mid-band at 2.6 GHz, and the high band at 26 GHz.[36]

[34] International Trade Administration. (2024, March 03). *Indonesia Artificial Intelligence*. International Trade Administration. https://www.trade.gov/market-intelligence/indonesia-artificial-intelligence
[35] GSMA. (n.d.). 5G Spectrum Guide. GSMA. https://www.gsma.com/connectivity-for-good/spectrum/5g-spectrum-guide-2/
[36] Kompas. (2024, September 12). *Kominfo Lelang Tiga Frekuensi 5G di awal 2025*. Kompas.com. https://tekno.kompas.com/read/2024/09/12/18290087/kominfo-lelang-tiga-frekuensi-5g-awal-2025#google_vignette

- The patchy implementation of the World Trade Organization (WTO) Information Technology Agreement (ITA) I, along with Indonesia's status as a non-party to WTO ITA II, results in higher costs for importing necessary hardware. This situation disincentivizes investments in higher-value activities within the digital supply chain, including software design and manufacturing. Such advancements are crucial for Indonesia to move up the supply chain. The WTO ITA framework guarantees lower tariffs for imports of IT parts and equipment among member countries, highlighting the need for Indonesia to engage more actively in global trade agreements to enhance its digital capabilities.
- The government should consider streamlining regulatory processes to reduce barriers to developing digital infrastructure, such as simplifying permit procedures, promoting legal certainty, and offering financial incentives for private sector investments in data centers and connectivity. Rather than focusing on restrictive data localization policies, Indonesia should adopt a more open approach that promotes the free flow of data. This would create a more attractive regulatory environment for cloud service providers and other digital economy investors, encouraging greater foreign investment and positioning Indonesia as a digital hub in Southeast Asia.
- Indonesia's Personal Data Protection (PDP) Law No. 27/2022 aims to address fragmented data protection regulations but faces significant challenges, including unrealistic response times for data controllers, a broad scope for data breach notifications, and unclear mechanisms for cross-border data transfers. The establishment of a dedicated PDP Agency is still pending, contributing to regulatory uncertainty and complicating the enforcement of data protection laws. To enhance its data governance framework, Indonesia should refine its cross-border data transfer rules, clearly define the role and responsibilities of the PDP Agency, and align its regulations more closely with international best practices such as the European Union's General Data Protection Regulations (GDPR). These improvements would streamline data protection processes, reduce compliance burdens, and create a more favorable environment for innovation and investment.

1. Overview of the ICT Sector

The Importance of the ICT Sector for *Visi Indonesia Emas 2045*

In recent years, Indonesia's digital economy has experienced rapid growth. From 2017 to 2021, it has grown by more than 414% and is projected to increase by 62% from 2021 to 2025 (Sapulette & Muchtar, 2023). This digital transformation has brought about monumental changes in every layer of society. Digital connectivity has considerably grown in the past decade as mobile subscriptions surged and internet coverage exceeded 97% in 2022 (International Telecommunication Union, 2023; GSMA Intelligence, 2023).

The widespread use of the internet and mobile devices has opened the door for the digital economy to penetrate every aspect of everyday life, from transportation choices to lifestyle preferences. As part of *Visi Indonesia Emas* 2045 (2045 Golden Indonesia Vision), digital transformation is among the 17 development directions as part of the economic transformation under the 2024-2045 Long Term Development Plan (RPJPN) (Bappenas, 2024).

Visi Indonesia Digital 2045 (Indonesia Digital Vision 2045) is supported by three pillars: (i) digital government, (ii) digital economy, and (iii) digital society. These pillars will be underpinned by the development of a digital ecosystem encompassing data and security, research and digital innovation, digital human capital, and policies and regulations. The Indonesia Digital Vision 2045 outlines the key targets ranging from improving digital infrastructure (i.e., internet connectivity and coverage), increasing digital economy contribution to the economy, increasing digital capability and capacity for society, and enhancing the quality of e-government (i.e., efficiency and security).

As part of a broader effort to navigate the digital economy landscape and challenges, the Indonesian government launched the White Paper for Digital Economy 2030 and identified various mid-term and long-term objectives for improving the country's digital competitiveness by 2030. This includes the development of digital infrastructure, the quality and quantity of ICT human capital, funding and investment, business climate, and policy and regulations. Overall, Indonesia should be positioned to fully maximize its potential and reap the benefits from the growing digital economy by enhancing its competitiveness and stimulating innovations in the said areas.

This sectoral overview will focus on three important aspects. First, it will discuss the current state of Indonesia's digital backbone, including data centers, telecommunication infrastructure, and artificial intelligence. Second, this sector overview will briefly discuss data governance.

2. Digital Backbone: Data Center, Telecommunication Infrastructure, and Artificial Intelligence (AI)

Key Highlights

- Data center development in Indonesia is growing rapidly, driven by the increasing demand for data storage, digital services, and cloud computing due to digitalization. and data localization regulations. However, this growth is challenged by high investment costs, intensive energy requirements, and the need for specialized infrastructure. Import barriers for necessary hardware and equipment further hinder the expansion. Indonesia's incomplete participation in global trade agreements, such as the WTO Information Technology Agreement (ITA) also limits its access to essential infrastructure components and creates a less competitive environment.
- Indonesia's telecommunication infrastructure faces challenges due to its geographical complexity and regulatory hurdles. High costs and logistical difficulties impede the expansion of digital networks across the archipelago. Bureaucratic obstacles, including complex permit processes and regional levies, complicate infrastructure development. The government has launched initiatives such as Bakti Kominfo and Satellite Satria to improve connectivity, especially in remote areas, but issues such as spectrum availability, high spectrum costs, and limited 5G penetration make it challenging for private operators to build telecommunications infrastructure in the more feasible geographical areas.
- Indonesia's AI regulatory landscape is in its nascent stages, with recent guidelines introduced by the Ministry of Communication and Informatics (MoCI) and the Financial

Services Authority (OJK) to promote responsible AI use. These guidelines focus on ethical AI practices, consumer welfare, and adherence to international standards.

- To advance investment in telecommunication infrastructure and AI development, it is recommended that the Indonesian government revisit import restrictions and aim to better facilitate the importation of essential hardware and software, fostering competition and innovation while collaborating with the private sector to strengthen data center infrastructure and enhance international connectivity. The government could also consider focusing on creating a conducive environment for private sector participation through competitive spectrum pricing. Additionally, streamlining licensing and permitting processes will reduce bureaucratic delays. Consolidating the existing government bodies overseeing digital transformation will also ensure consistent and effective regulatory practices, positioning Indonesia as a leader in the regional digital economy.

To build a robust digital economy and achieve Indonesia Digital Vision 2045, the country must prioritize the development of essential digital infrastructure, including widespread broadband access, data centers, and next-generation networks like 5G (World Bank, n.d.; African Union, 2020). This infrastructure is critical for basic connectivity and serves as the backbone for advanced technologies such as AI and the Internet of Things (IoT), which rely on high-speed data transmission and vast computational power. Alongside infrastructure, a comprehensive regulatory framework is crucial for creating a secure and predictable environment for digital businesses.

OECD (2019) highlights the need for cybersecurity laws, digital governance standards, and strong intellectual property rights to protect innovation and foster trust in digital transactions. Equally important is investment in human capital to ensure that the workforce is equipped with the necessary digital skills. Improving digital literacy; science, technology, engineering, and mathematics (STEM) education; and continuous learning opportunities to keep pace with technological advancements are essential to compete in the newly digitalized environment (World Bank, n.d.; OECD, 2019). Furthermore, fostering innovation through a supportive start-up ecosystem and public-private partnerships can drive the development of new digital technologies and business models (UNCTAD, 2019). Together, these elements create a solid foundation for a thriving digital economy that is inclusive, innovative, and sustainable.

2.1. Digital Infrastructure: Data Center Development

As the digital economy has surged in recent years, both globally and in Indonesia, the demand for data centers has grown substantially. This is a major component of the growing trend among the private and public sectors in employing cloud computing, delivering infrastructure, services, and software on-demand via the networks, to reduce costs (i.e., IT costs) and improve efficiency, agility, scalability, and organization resilience (PwC, 2021; CSIS Indonesia, 2023).

The use of cloud-computing services depends on data centers providing services to a massive pool of customers, such as those operated by the private sector and/or in-house data centers

used by the government and state-owned enterprises (ADB, 2017). Despite their potential in Indonesia, data centers require high investment costs, intensive energy use, and high-speed internet connection (Baker Mackenzie, 2021; ADB, 2017). For data centers providing hyperscale storage services, the facility tends to be state-of-the-art and purpose-built to meet individual requirements, requiring certainty and a long-term revenue stream to remain profitable.

One of the drivers of cloud business investment is a regulatory environment that enables the free flow of data. For investments in the cloud business to be viable, regulations should enable flexibility for customers and users to make their own choice of location for data storage and processing. Without such flexibility, cloud users, which include start-ups and MSMEs, may face more limited cloud service offerings.

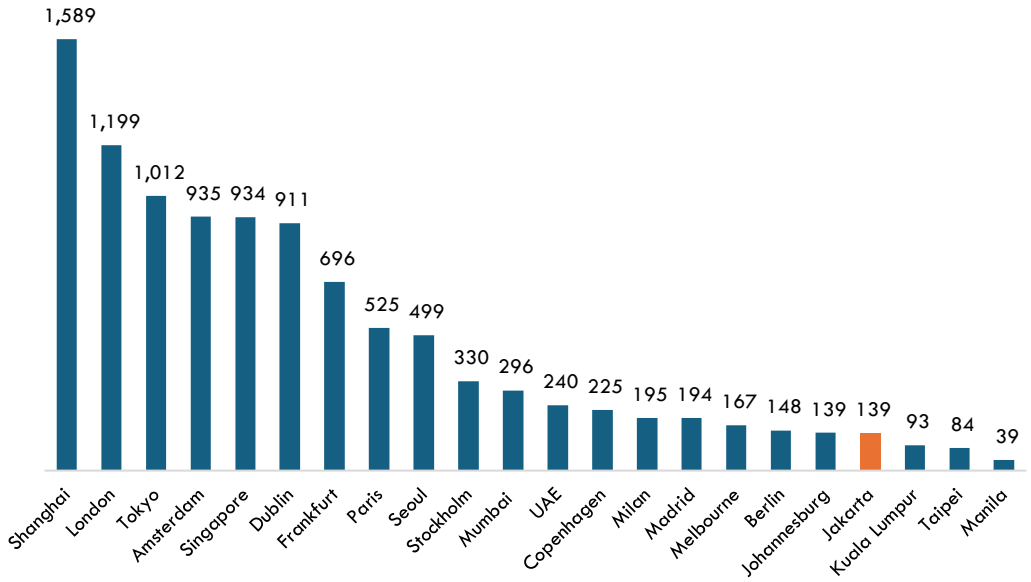
Data localization policies have evolved to target a growing range of data in more countries. The number of countries that have enacted data localization requirements has nearly doubled from 35 in 2017 to 62 in 2021 (ITIF, 2021), while the total number of data localization policies (both explicit and de facto) has more than doubled from 67 in 2017 to 144 in 2021. Another 38 data localization policies have been proposed or considered in countries worldwide. In 2022, McKinsey reported that 75% of all countries have implemented some form of data localization. Such requirements are usually driven by factors such as privacy, security, data protection, jobs, systemic protection, law enforcement, and sovereignty (IIF, 2020; ITIF, 2021; IFGP Research, 2021).

CIPL (2023) emphasizes that data localization policies can significantly disrupt critical business operations—such as cybersecurity, human resource management, and fraud prevention—by restricting access to the global data flows essential for these functions. These policies also hinder individuals' access to valuable services like cloud computing, financial services, and international collaboration in areas such as medical research. The reduced effectiveness of data-driven services due to localization can lead to higher operational costs, stifle innovation, and diminish the global competitiveness of businesses. Moreover, such policies may lower the quality and availability of digital products and services, which are increasingly vital to consumers and businesses alike. Conversely, facilitating cross-border data flows enables data storage and processing across global networks. Cloud computing enhances operational flexibility, resilience, and security. This global distribution allows for data redundancy, ensuring services remain operational during regional disruptions and providing robust cybersecurity measures often unattainable through localized data storage solutions.

Stringent requirements for cross-border data transfers could negatively affect trade that depends on dataflows (Matto & Meltzer, 2018; Van der Marel & Ferracane, 2021). These include digitally delivered data-processing and data-related business services exported from developing countries such as India, as the requirements increase transaction costs in doing business. Overly restrictive regulatory barriers for data transfer constrain the potential for poorer countries to reap the benefits of exporting data-intensive services as the demand for digital services grows. The effects of these restrictions could cascade to other sectors in both importing and exporting countries, as the economy becomes increasingly dependent on cross-border services to add value (ECIPE, 2013; Frontier Economics, 2022). Restrictive data localization policies also further disincentivize data center investments as they undermine cost efficiencies provided by cloud computing and complicate regulatory compliance (IIF, 2020).

Indonesia is one of the countries that implement data localization requirements. The preparedness and capacity of the data center play a key role in supporting Indonesia's capability to store data locally. In 2020, the data center capacity in Jakarta was around 72.5 MW. This capacity increased rapidly, reaching around 139 MW in 2023 (**Figure 1**). Despite this rapid growth rate, Jakarta's live IT power (a proxy for data center capacity) lags behind various global cities, such as London, Singapore, and Mumbai.

Figure 1: Data Center Capacity in Various Global Cities (Live IT Power, MW)



Source: Knight & Frank (2023)

Data centers are forecasted to grow exponentially for years. Various estimates suggest that data center capacity in Indonesia will reach between 303 MW and 463 MW in 2028 (Mordor Intelligence, 2023; Structure Research, 2023). Based on the Ministry of National Development Planning agenda (2019), Indonesia aims to become the fifth biggest economy in the world by 2045, with a GDP per capita of more than USD 23,000 (IDR 368 million).[37] If this long-term GDP per capita target is used as a reference for data center capacity, Indonesia needs to accelerate the growth of data center capacity. Based on **Table 1**, to reach Portugal's GDP per capita level, Indonesia needs to grow its data center capacity by around 7.1% per annum until 2045. Furthermore, to achieve a ratio of GDP per capita and data center that is on par with Japan, it needs to grow 16.3% per annum and 18.2% per annum to reach Australia's level.

[37] USD 1 = IDR 16,000

Table 1: GDP per Capita and Data Center Capacity Comparison

Country	GDP per Capita (USD)	Data Center Capacity (MW)
Luxembourg	115,873.6	18,560.3
Singapore	59,797.7	21,750.3
Iceland	59,270.1	12,180.3
Netherland	52,397.1	5,800.3
Australia	52,518.3	4,785
Canada	48,072.6	3,350
Belgium	44,594.3	877
New Zealand	41,477.9	2,712
United Kingdom	40,284.6	3,509
Japan	39,538.9	3,190
Italy	31,676.2	447
South Korea	31,489.1	1,595
Spain	27,063.2	319
Czech Republic	22,932.2	431
Portugal	22,437.1	399
Poland	15,656.1	271
Indonesia	4,919.7	139

Source: IFGP Research (2021)

Government support and commitment are vital to achieving the required growth in data center capacity, which hinges on substantial improvements in investment, electricity infrastructure, and overall competitiveness (IFGP Research, 2021). The government of Indonesia initially targeted establishing five national data centers across Cikarang, Batam, Sulawesi Utara, Labuan Bajo, and the new capital (*Ibu Kota Nusantara*, IKN) to manage classified data. However, budgetary constraints have narrowed the focus to three locations: Cikarang, Batam, and IKN. As of August 2024, only the Cikarang data center is under construction, with construction on the other two still pending. Furthermore, the government has stated that data centers owned by private companies can be utilized exclusively for nonclassified information. This policy addresses national security concerns by ensuring that sensitive or classified data remains within government-operated facilities, thereby maintaining strict control over its security. Indonesia may also benchmark from neighboring countries, such as Singapore, on how the private sector can actively participate in assuring the highest security for government data.

Given Singapore's current moratorium on new data center construction, Indonesia is well-positioned to capitalize on this opportunity and establish itself as a new data center hub in Southeast Asia that can accommodate both private data as well as public data. According to interviews with government officials, Indonesia plans to attract data center investment by creating favorable conditions, particularly in Special Economic Zones (KEK), such as KEK Nongsa and KEK Singasari.

The government is offering a range of incentives, including streamlined regulatory processes and various financial benefits like tax holidays and tax allowances for investments in the KEK. These benefits are designed to be competitive with those offered in Johor, Vietnam, and the Philippines, regions also vying to become major data center hubs in Southeast Asia. Additionally, Indonesia is prepared to support data center development with its renewable energy resources. The country is investing in solar and geothermal power plants, among other renewable energy sources, to ensure a sustainable energy supply for data centers. This readiness to integrate renewable energy strengthens Indonesia's appeal as a destination for data center investment and leverages its position as part of a global digital hub.

AWS Enhancing SMEs Growth and Sustainability

How can small and medium enterprises (SMEs) align sustainability strategies while unlocking significant advantages for their growth and profitability? As the backbone of the nation's economy, SMEs face a pressing challenge today of expanding their businesses while keeping sustainability at the forefront. As Indonesia moves toward its sustainability goals, the cloud is emerging as a key tool that can help businesses operate more efficiently while reducing their environmental impact.

Migrating operations to the cloud isn't just about enhancing IT infrastructure; it's also about making a meaningful contribution to the environment. According to a recent Accenture report, shifting to Amazon Web Services (AWS) is up to 4.1 times more energy efficient than traditional on-premises data centers. For companies handling compute-heavy tasks like artificial intelligence, this efficiency can reduce carbon emissions by up to 87%. And when you factor in carbon-free electricity, optimizing workloads on AWS can further reduce your carbon footprint by as much as 99%.

This reflects AWS's commitment to sustainability, as an integral part of Amazon's commitment to Climate Pledge to become net-zero carbon by 2040. In 2023, AWS achieved a significant milestone by matching all of its global electricity use with 100% renewable energy—seven years ahead of its original 2030 target.

"AWS is proud to announce the long-term investment commitment of USD 5 billion in Indonesia, enabling an average of 24,700 jobs annually and skills development opportunities in the process. We appreciate the support that we've received to date on enabling a path to 100% carbon-free energy use toward our operations in Indonesia, and hope to continue to work together and collaborate on how to decarbonize our operations in Indonesia—and Indonesia's grid more generally—in the years to come," said Ken Haig, AWS Head of Energy and Environmental Policy for Asia Pacific.

For Indonesian SMEs, this means that by utilizing AWS's services, they are also building sustainability into their solutions. By making the move to AWS, they're not only gaining access to cutting-edge, scalable technology but also playing a direct role in advancing Indonesia's green agenda.

AWS's dedication to sustainability goes beyond energy—it's also deeply committed to water conservation. The company's goal to become water positive by 2030 is part of a broader effort to return more water to communities than it uses in its operations.

This commitment is particularly crucial in water-stressed regions like several areas in Indonesia. AWS has teamed up with organizations like Water.org and Habitat for Humanity to make a real difference. Together, they've improved education, training, and access to water in high-stress river basins and watersheds.

Through these collaborations, AWS has financed the expansion of direct water service connections to more than 35,000 households in Java. AWS has also provided technical assistance to reduce water leakage by over 35 percent across regional water utilities. In partnership with Habitat for Humanity, AWS is helping improve access to water, sanitation, and hygiene, as well as developing healthcare and disaster management capabilities across nine villages.

"AWS is the world's most comprehensive and broadly adopted cloud offering, with millions of global users depending on it every day. To build a sustainable business for our customers and for the world we all share, we're designing data centers that provide the efficient, resilient service our customers expect while minimizing our environmental footprint—and theirs," said Ken Haig.

By leveraging the cloud, businesses of all sizes can make a significant impact on both digitalization and sustainability—contributing to a greener and more resilient digital future for Indonesia.

2.2. Telecommunication Infrastructure: Digital Connectivity Development in Indonesia

A robust telecommunication infrastructure is essential for supporting the digital economy. Key components of this infrastructure include network infrastructure, such as high-speed internet via fiber optic networks, broadband access, and 5G technology. Below is the status of each telecommunication infrastructure component in Indonesia (**Table 2**).

Table 2: Status of Telecommunication Infrastructure in Indonesia

No.	Infrastructure	Detail
1.	High-speed internet	Ookla's Speedtest Global Index indicated that as of May 2024, the median mobile internet download speed reached 24.53 Mbps with an upload speed of 13.50 Mbps.[38] The median fixed-broadband download speed was 31.20 Mbps, with an upload speed of 18.8 Mbps. Compared to neighboring countries, Indonesia's ranking in internet speed lags behind.[39] For mobile internet speed, Indonesia ranks 97th, while Singapore ranks 21st, Malaysia 25th, Vietnam 57th, and Thailand 62nd. The disparity is more pronounced in fixed-broadband

[38] Speedtest Global Index. (n.d.) *Indonesia Median Country Speeds Updated September 2024*. https://www.speedtest.net/global-index/indonesia
[39] Speedtest Global Index. (n.d.). *Median Country Speeds Updated September 2024*. https://www.speedtest.net/global-index

No.	Infrastructure	Detail
		speed, where Indonesia ranks 127th out of 181 countries. In contrast, Singapore ranks 1st, Thailand 8th, Malaysia 39th, and Vietnam 40th.
2.	5G technology	Launched in May 2023, 5G technology covers only 49 districts as of 2023,[40] with a penetration rate of 5G smartphones at just 5%.[41] To date, only three major telecommunication providers offer 5G services. The Indonesian government targets nationwide coverage by 2025, underscoring significant strides toward making this technology universally accessible,[42] although distribution remains uneven (GSMA, 2023). For 5G to function optimally across various use cases, a combination of low-, mid-, and high-band spectrum is essential.[43] Current 5G deployment depends on existing spectrum bands used for LTE (4G) and 2.3 GHz. The government is preparing to auction three spectrum bands—low at 700 MHz, mid at 2.6 GHz, and high at 26 GHz—in early 2025.[44]
3.	Fiber optics	As of December 2022, fiber optic distribution in Indonesia has reached only 4,412 subdistricts out of 7,230, or 61.02% of the total (MoCI, 2024). Approximately 40% of subdistricts still lack access to fiber optics, primarily due to the high costs of network implementation in commercially unviable areas (Aji, 2022 in Aji, 2024). In parallel, the government's Palapa Ring Project, which aims to connect 57 district capitals, has yet to be optimally utilized. It only connects to the Network Operations Center and the lack of last-mile connectivity combined with challenging geography further constrains its utilization. This gap in coverage poses a significant challenge to the government's ambitious target of achieving average internet speeds of 100 Mbps by 2029, with aspirations for speeds up to 1 Gbps in 98 cities.

Source: Various Sources

2.3. Key Issues in Data Center Development

As a key component of the digital infrastructure stack, data centers serve as physical infrastructures that house computing machines and related hardware. Cloud data centers offer greater flexibility in usage options, resource sharing, and redundancy, significantly reducing both hardware investment and ongoing maintenance costs.

[40] Ministy of Communication and Informatics. (2023, November 02). *Percepat Implementasi 5G Kominfo ajak Kolaborasi Pemangku Kepentingan* [Press Release]. https://www.kominfo.go.id/index.php/content/detail/52649/siaran-pers-no-433hmkominfo102023-tentang-percepat-implementasi-5g-kominfo-ajak-kolaborasi-pemangku-kepentingan/0/siaran_pers

[41] Mediana. (2023, October 09). 5G Penetration Has Not Yet Increased, Cellular Operators Urge Frequency Provision and Incentives. Kompas. https://www.kompas.id/baca/english/2023/10/09/en-penetrasi-5g-belum-kunjung-naik-operator-seluler-desak-penyediaan-frekuensi-dan-insentif

[42] Ericsson. (2023, June 28). *Ericsson Mobility Report: Global 5G growth continues - Ericsson committed to support Indonesia's 5G deployments* [Press Release] https://www.ericsson.com/en/press-releases/2/2023/6/ericsson-mobility-report-global-5g-growth-continues-indonesia

[43] GSMA. (n.d.). *5G Spectrum Guide*. GSMA. https://www.gsma.com/connectivity-for-good/spectrum/5g-spectrum-guide-2/

[44] Kompas. (2024, September 12). *Kominfo Lelang Tiga Frekuensi 5G di awal 2025*. Kompas.com. https://tekno.kompas.com/read/2024/09/12/18290087/kominfo-lelang-tiga-frekuensi-5g-awal-2025#google_vignette

However, as physical infrastructure investments, data centers face challenges throughout their development and operational stages. Complex permitting requirements, fragmented compliance reporting, and fluctuating local regulations increase uncertainty in realizing data center investments. These challenges also complicate planning for future development or expansion, as investors may struggle to anticipate the presence of an enabling environment. To address these issues, the enabling landscape should resemble that of most infrastructure investments, with streamlined permitting processes, legal certainty, and manageable compliance requirements. The enabling landscape should also foster policies that provide room for innovation, are responsive to industry practices, and are supportive of sustainability, such as by greater and more affordable access to renewable energy. Promoting such an enabling landscape will enhance Indonesia's position not only in infrastructure investment but also, more recently, in digital infrastructure, strengthening its role as a digital hub.

Other than that, accelerating the development and expansion of data centers in Indonesia requires hardware and high-tech equipment as building blocks. According to Cisco (n.d.), data centers need routers, switches, firewalls, storage systems, servers, and application delivery controllers. Data center security is also critical because these components store and manage data and applications. Together, they provide network infrastructure, storage infrastructure, and computing resources. Thus, barriers to importing hardware and equipment could pose a challenge to developing data centers in Indonesia, as various necessary hardware and equipment are not produced locally and may also be highly specific or bespoke equipment tailored to specific data center requirements.

Indonesia's participation in the WTO ITA since 1996 marked a significant step for a developing nation in the global ICT sector. Despite this early commitment, Indonesia has yet to capitalize on its ITA membership benefits fully. Government officials have cited several reasons for this hesitation to fully implement the agreement, including difficulties in complying with certain articles of the ITA that pose challenges for the country. Additionally, Indonesia prioritizes maintaining its technological sovereignty, acknowledging that its domestic ICT industry is still relatively young and requires protection before it can effectively compete globally. Furthermore, Indonesia has not joined WTO ITA II, which limits its ability to access the broader benefits offered by the expanded agreement, including lower prices for businesses importing ITA products, lower prices for consumers, and reduced barriers for exporters (DFAT, n.d.).

The ever-changing dynamics of the global market also contribute to Indonesia's cautious approach toward complete ITA adherence. Currently, the Indonesian government is focused on strengthening foundational aspects, such as intellectual property protection, human rights safeguards, regulatory frameworks, infrastructure development, and human resource training. These efforts aim to create a more conducive environment for future participation and competitiveness in the international ICT arena. The share of ICT goods exports from Indonesia is merely 3.5% of its total goods exports, lagging behind other ITA-member countries.[45] This situation underscores that mere membership in the ITA is insufficient; it needs to be bolstered by comprehensive trade liberalization policies and an inviting climate for both domestic and foreign investments.

[45] ITIF (2017). *Assessing the Benefits of Full ITA Participation for Indonesia, Laos, Sri Lanka, and Vietnam*.

Indonesia's ICT sector faces several regulatory challenges that inhibit its potential growth. Notably, MoCI Regulation No. 82/2012, later replaced by Government Regulation No. 71/2019, mandates the surrender of source codes for market access and the local storage of data.[46] While these policies aim to protect sensitive information, including financial data of the government that, by law, must be processed domestically, they also introduce forced localization measures. This approach counteracts the potential benefits of ITA membership and deters foreign investors who might view these requirements as restrictive and opaque. The perception of Indonesia's regulatory environment as inconsistent further complicates efforts to attract the foreign direct investment (FDI) essential for the ICT sector's expansion.

Indonesian policymakers have historically concentrated on developing the ICT production sector, even though the ICT services sector contributes three times more to the economy.[47] Much of the ICT growth in Indonesia is driven by e-commerce, a sector that has thrived in the digital era. However, policy strategies that focus more on compulsion than attraction are perceived as more restrictive instead of enabling. This approach has not effectively enticed FDI into the country, limiting the sector's growth potential.

The global landscape illustrates stark contrasts in ICT export performance. Since joining WTO ITA and ITA II, South Korea significantly boosted its ICT exports and economic impact by eliminating tariffs on key products, enhancing competitiveness in global markets, and providing faster market access compared to free-trade agreements (FTA) like the Korea-China FTA (Ezell, 2015). From 1996 to 2010, Korea's ICT exports grew by an average of 10% annually. The ICT sector accounted for 11.2% of Korean GDP in 2011, up from 9.1% in 2006. By eliminating tariffs on various ICT products, the ITA has helped Korea integrate into global ICT production value chains. For example, LG and Samsung are now major suppliers of application processors, displays, and DRAM memory chips. In fact, South Korea's value-added contributions to the iPhone 4 was 3.5 times higher than that of the United States and nearly four times greater than Taiwan's (Ezzel, 2015).

Similarly, Malaysia has seen its ICT industry grow substantially since joining the WTO ITA. ICT revenues nearly tripled from USD 21.7 billion in 1996 to USD 60.5 billion by 2010, with an average annual growth of 8% (MITI, 2015). By 2010, Malaysia ranked 8th among global ICT exporters and 9th among importers. The elimination of tariffs on ICT components has allowed Malaysian firms to lower production costs and enhance competitiveness, boosting exports to key markets like the US, EU, and China.

Thailand has also benefitted from joining the ITA, with ICT export values reaching USD 37.28 billion and imports standing at USD 35.1 billion by 2011 (Saragganda, 2012). The agreement spurred a 37% increase in ICT employment between 2002 and 2010, reaching 424,513 workers (Saragganda, 2012). Low tariffs have promoted greater ICT adoption, driving economic growth and boosting Thailand's global ICT competitiveness. In 2010, both Malaysia and Thailand were among the top 10 ICT exporters and importers globally.[48]

Unfortunately, Indonesia's accession to the WTO ITA in 1996 has not brought the anticipated benefits. Despite a five-fold increase in the value of ITA-covered product exports, Indonesia's

[46] ITIF (2017).
[47] ITIF (2017).
[48] World Trade Organization. (n.d.). *The WTO's Information Technology Agreement (ITA*). https://www.wto.org/english/news_e/brief_ita_e.htm

global export share stagnated at 0.3% from 1996 to 2015 (WTO, 2015 in Ezell and Wu, 2017). Since 2010, the sector has faced challenges, with ICT exports falling by 32%, from USD 7.8 billion in 2011 to USD 5.3 billion in 2015. Additionally, ICT exports as a share of total goods exported have halved, dropping from 6% in 2010 to just 3% today. One possible reason for the lack of anticipated benefits is the uneven execution of policies and regulations associated with the ITA. Inconsistent enforcement of tariff reductions and non-tariff measures may have limited the competitive edge needed to boost exports. Moreover, a lack of supporting infrastructure, such as inadequate logistics and technological ecosystems, may have hindered Indonesia from fully capitalizing on ITA membership.

E-commerce has become vital to Indonesia's digital economy, significantly contributing to the ICT service sector. The proliferation of online marketplaces and the increasing internet penetration have spurred e-commerce growth, stimulating demand for ICT hardware and services. However, a conducive regulatory environment that encourages innovation and investment is needed to support this growth.

2.4. Key Issues for Telecommunication Infrastructure for Digital Connectivity

Indonesia's telecommunication infrastructure development faces notable obstacles, primarily driven by its geographic and regulatory complexities. The archipelagic nature of Indonesia creates unique challenges for telecommunication infrastructure. The country is spread across thousands of islands, making the rollout of digital networks both costly and logistically complex. Extending infrastructure to remote and isolated areas requires significant investment in undersea cables, satellite technology, and other specialized equipment. The sheer scale of these islands and their dispersed nature mean that establishing and maintaining digital connectivity is a daunting task with high financial and operational demands.

Compounding these geographic difficulties are regulatory and bureaucratic challenges. The process of obtaining permits and licenses is often entangled in a web of complex and time-consuming regulations. Local government regulations, such as those concerning infrastructure construction like poles and excavation, further complicate the approval process. Additionally, regional levies, such as those imposed on constructing base transceiver station (BTS) towers through local regulations (Perda), have become one of the most significant obstacles to infrastructure development. These issues are currently being addressed by the Coordinating Ministry for Economic Affairs and the Ministry of Home Affairs.

Moreover, internet services are often viewed as a luxury, leading to the imposition of various taxes that further hinder development. To overcome these challenges, there is a pressing need for harmonization of regulations between MoCI and the Ministry of Home Affairs. This alignment is crucial to streamline processes and reduce the regulatory burden, enabling more efficient deployment and management of telecommunication infrastructure nationwide.

The government has launched several key initiatives to enhance telecommunication infrastructure in response to these challenges. The Bakti Kominfo program is a significant step towards improving connectivity in underserved regions. By partnering with private sector entities, the government aims to bridge the digital divide and expand access to essential digital services nationwide. The Satellite Satria project represents another crucial effort. This satellite-based initiative is designed to provide high-speed internet access to remote and rural areas,

overcoming the limitations imposed by Indonesia's vast and diverse geography. By utilizing satellite technology, the government seeks to reach regions that are difficult to connect with using traditional infrastructure.

Public-Private Partnerships (PPPs) are also being leveraged to address infrastructure challenges. These collaborations combine government resources with private sector expertise, facilitating more effective and efficient infrastructure development. Integrating the Palapa Ring network is also a key part of the strategy, aiming to provide comprehensive, high-speed connectivity throughout the archipelago.

Another key issue is the low penetration of 5G. The relatively low penetration of 5G in Indonesia can be attributed partly to spectrum allocation and availability issues. In Indonesia, 5G deployment relies on the existing spectrum which serves LTE (4G) and 2.3 GHz. The government plans to release three key spectrum bands: the low-band spectrum (700 MHz) for broad coverage and rural penetration, the mid-band spectrum (2.6 GHz and 3.5 GHz) for a balance of speed and coverage in urban areas, and the high-band spectrum (26 GHz and 28 GHz) for delivering ultra-fast speeds and high capacity in dense urban environments.[49] These bands collectively will enable Indonesia to build a versatile 5G network that caters to both widespread connectivity and high-performance demands. The government announced that the low band at 700 MHz and the high band at 26 GHz were initially ready for auction in 2024. However, after receiving input from operators, the government decided to postpone the auction to early 2025 to align it with the mid-band spectrum auction.[50] The mid-band spectrum at 2.6 GHz is currently allocated for satellite broadcasting, with the contract expiring in 2024. Once the contract ends, the spectrum will be repurposed for 5G. The government is now preparing to auction all three spectrum bands.[51]

According to the GSMA (2022), the International Telecommunication Union (ITU) requires a minimum of 100 MHz bandwidth per operator for 5G, which can support up to 1 GHz per operator in mmWave bands. However, more than this capacity is needed to keep up with future demands. As more people use mobile devices and fixed wireless access with 5G, and as new and innovative uses for 5G technology develop, more spectrums will be needed across low, mid, and high-frequency bands. The GSMA report further explains that between 2025 and 2030, each country will need an average of 2 GHz of mid-band spectrum for 5G. This mid-band spectrum is essential for rolling out 5G and is expected to bring most of the economic and social benefits of the technology in the next decade. By 2030, each market will also need an average of 5 GHz of high-band spectrum. This will work alongside the mid-band and low-band spectrum to offer high-speed internet, similar to fiber-optic connections, through fixed wireless access. It will also ensure reliable and fast networks in busy places like sports stadiums, concert venues, and travel hubs. There is also a need for a lower-band spectrum for 5G, which is below 1 GHz. Expanding this spectrum is vital to give rural areas the same level

[49] Ministy of Communication and Informatics. (2022, January 19) *Menkominfo Tegaskan Frekuensi 5G Tak Ganggu Penerbangan* [Press Release]. https://www.kominfo.go.id/content/detail/39470/siaranpers-no-14hmkominfo012022-tentang-menkominfotegaskan-frekuensi-5g-di-indonesia-tak-ganggupenerbangan/0/siaran_pers

[50] Kompas. (2024, September 12). *Kominfo Lelang Tiga Frekuensi 5G di awal 2025*. Kompas.com. https://tekno.kompas.com/read/2024/09/12/18290087/kominfo-lelang-tiga-frekuensi-5g-awal-2025#google_vignette

[51] Kompas. (2024, September 12). *Kominfo Lelang Tiga Frekuensi 5G di awal 2025*. Kompas.com. https://tekno.kompas.com/read/2024/09/12/18290087/kominfo-lelang-tiga-frekuensi-5g-awal-2025#google_vignette

of internet service as urban areas, helping to promote digital inclusion and equal access to technology.

Only three Indonesian mobile operators, Telkomsel, Indosat Ooredoo, and XL Axiata, provide 5G services. In Indonesia, spectrum is assigned via auction for an initial 10-year license, with an option for a 10-year extension (GSMA, 2023). The auction fees are paid annually over the first decade, and any extensions incur annual spectrum fees determined by a specific formula (GSMA, 2023). One significant reason only these three operators offer 5G is the high cost of spectrum,[52] which constitutes 12% of their revenue (GSMA, 2023). These expenses cover licenses, Universal Service Obligation (USO) fees, permits, and other regulatory costs, significantly impacting affordability and financial sustainability. High spectrum costs also negatively affect mobile network quality by limiting investment and slowing the deployment of new technologies (GSMA, 2023).

According to government officials, Indonesia's spectrum costs are higher than the global average, driven by a combination of the government's revenue requirements and the distinct challenges of the nation's telecommunications sector. At the heart of this issue is the role of spectrum as a vital source of non-tax state revenue for MoCI. The funds generated from spectrum fees are crucial for financing government programs. In addition, the House of Representatives (DPR) assigns a high spectrum revenue target to MoCI every year and increases this every year.

To meet fiscal targets set by DPR and to ensure the government meets them, spectrum costs are set at a premium. The average spectrum cost in Indonesia accounts for 12% to 14% of revenue, compared to the global norm of 10%. This higher cost is also influenced by international benchmarking and the historical costs associated with spectrum allocation. Indonesia's approach aligns with global practices but is tailored to the country's specific needs, particularly in funding critical infrastructure projects.

Beyond spectrum costs, the challenges associated with the 5G rollout are closely tied to the operational realities that telecom operators face, which further escalate expenses. Expanding network coverage demands substantial investment, particularly in rural and remote areas. Operators must manage the complexities of deploying various spectrum bands, each with distinct coverage ranges and infrastructure needs. These challenges contribute to significant network expansion costs, which should be reflected in the overall pricing of the spectrum.

Despite these high costs, there is increasing demand from industry players for the Indonesian government to launch an auction for a new frequency spectrum.[53] To bridge this gap, the government might want to provide financial incentives for the use of frequency spectrum. Such incentives offset the high costs, enabling more operators to participate in the 5G rollout, improving network quality, and accelerating the deployment of advanced technologies. However, insights from government officials reveal that designing such incentives is a complex task. The government must carefully balance the need to generate revenue with the goal of

[52] Mediana. (2023, October 09). 5G Penetration Has Not Yet Increased, Cellular Operators Urge Frequency Provision and Incentives. *Kompas*. https://www.kompas.id/baca/english/2023/10/09/en-penetrasi-5g-belum-kunjung-naik-operator-seluler-desak-penyediaan-frekuensi-dan-insentif

[53] Mediana. (2023, October 09). 5G Penetration Has Not Yet Increased, Cellular Operators Urge Frequency Provision and Incentives. *Kompas*. https://www.kompas.id/baca/english/2023/10/09/en-penetrasi-5g-belum-kunjung-naik-operator-seluler-desak-penyediaan-frekuensi-dan-insentif

fostering a competitive telecommunications market. Crafting incentives that avoid adding unnecessary bureaucracy or overlapping with existing programs is challenging, and any misstep could lead to further cost increases.

2.5. Current AI Regulatory Framework in Indonesia

In December 2023, Indonesia issued two sets of ethical guidelines for AI: MoCI Circular Letter No. 9/2023 on AI Ethical Guidelines and OJK's Ethical Guidelines for Responsible and Trustworthy AI in Financial Technology. The MoCI guidelines apply to all AI-involved public and private electronic system operators, advocating for internal policies on data and AI ethics to enhance productivity in sectors such as creative industries, healthcare, and education. These guidelines are integral to Indonesia's strategy from the National Strategy for Artificial Intelligence 2020–2045.

MoCI opted to issue a circular letter instead of a more stringent regulation on AI[54] because Indonesia is still in the initial stages of exploring and adopting AI technologies. This means the focus will be on supervision and governance to mitigate potential risks associated with AI utilization. The risk-based approach would differ for each sector depending on each use case, resulting in tailored solutions. The OJK guidelines, meanwhile, focus on fintech entities and incorporate principles from Pancasila to uphold national interests and ethical responsibilities while ensuring consumer welfare, fairness, transparency, and security, aligning with international norms like those of the Organization for Economic Co-operation and Development (OECD) and the US National Institute of Standards and Technology (NIST). These guidelines signify the beginning of Indonesia's regulatory efforts for its AI ecosystem.

2.6. Best Practices

Data Center Development

In the Association of Southeast Asian Nations (ASEAN), five out of 10 member states participated in the WTO ITA 2, an expansion of the original ITA established in 1996 to include a broader list of IT products with reduced tariffs. The WTO ITA 2, agreed upon in December 2015, adds 201 new products to the list, subjecting them to tariff elimination. These products include GPS navigation systems, advanced semiconductors, and medical devices.

Malaysia, one of the participating countries, swiftly completed all domestic processes related to reducing and eliminating tariffs on all products stipulated in the agreement within six months of the agreement's adoption. Malaysia's commitment to the 201 new products covers 410 affected tariff lines at the 9-digit level, with approximately 86% (351 lines) already at zero duty. The remaining 59 lines, with existing duties ranging from 5% to 30%, will be gradually reduced to zero.

Since Malaysia's involvement in the original ITA, its ICT exports have tripled, growing from USD 21.7 billion in 1996 to USD 60.5 billion in 2010, reflecting an annual growth rate of

[54] International Trade Administration. (2024, March 03). *Indonesia Artificial Intelligence*. International Trade Administration. https://www.trade.gov/market-intelligence/indonesia-artificial-intelligence

approximately 8%. This growth underscores the positive impact of the ITA on Malaysia's ICT sector and economy.

The capacity of data centers is rising at a rapid pace. IEA (2024) states that data centers consumed 460 TWh in 2022, accounting for around 2% of global electricity usage. Furthermore, this number is forecasted to rise to more than 1,000 TWh by 2026 (IEA, 2024). Thus, similar to other industries, it becomes pivotal for data centers and industries to practice efficient usage of energy and utilize renewable energy. This is a potential avenue for Indonesia to leverage its natural resource abundance to attract higher investment while increasing its position as a digital hub. By promoting a favorable policy environment for industries, including data centers, to have greater and more affordable access to renewable energy, Indonesia could position itself at a greater competitive advantage among regions vying to become global tech hubs.

Telecommunication Infrastructure

South Korea is recognized as having one of the most universal and advanced telecommunication infrastructures in the world. It ranked second among 176 countries in the International Telecommunication Union (ITU)'s 2017 ICT Development Index. In terms of internet and mobile penetration rates, 100% of urban and rural populations are fully covered by a 4G mobile network and have access to the internet at home (ITU, 2021). South Korea was the first country to commercialize and ensure nationwide coverage of 5G networks in 2019, and it has since announced plans to pioneer 6G. The country is also among the world's top performers in the digitalization of its public sector. According to the UN DESA's 2022 E-government Index, South Korea is the leading country in Asia and third worldwide in e-government development. The telecommunication infrastructure of South Korea has laid the foundations for it to become a major player in the global digital industry (ITU, 2020). Its telecommunication infrastructures, such as affordable, high-speed broadband networks, served as breeding grounds for innovation.

South Korea's approach of "government-driven, infrastructure-first" has played a pivotal role in building a strong digital infrastructure. Based on this approach, the government of South Korea implemented a series of top-down policies, with a particular focus on the strategic implementation of telecommunications and broadband networks. As early as the 1970s and 1980s, the South Korean government recognized the importance of connectivity and invested nearly 1% of its GDP to construct a universal telecom network. This investment was followed by a USD 620 million infrastructure upgrade in the 1990s. Furthermore, the South Korean government also enacted laws to prohibit unreasonable rates of fiber line access and market monopolization. These efforts led to universal fiber access, faster speeds, and lower costs. As the 2000s heralded the age of the internet, the government of South Korea pushed to ensure broadband networks to provide universal internet access. South Korea quickly achieved nationwide broadband coverage by encouraging competition in the broadband market and providing rural broadband subsidies. In the 2010s, the government of South Korea continued to invest in telecommunication infrastructure, establishing a nationwide 4G network in 2011 and a 5G network in 2019. These networks have enabled widespread adoption of digital

technologies like mobile payments and artificial intelligence and have played a significant role in bolstering South Korea's digital economy.

AI Regulation

Indonesia stands at a pivotal moment in its digital transformation journey. As the nation seeks to harness the full potential of AI technologies, adopting best practices for AI governance and ethics is crucial. Following the ASEAN Guide on AI Governance and Ethics provides a comprehensive framework that aligns with global standards and ensures AI's responsible development and deployment. The ASEAN Guide emphasizes a risk-based approach to AI governance, encouraging iterative risk assessments to ensure safety and security. By adopting this framework, Indonesia can mitigate risks associated with AI, ensuring that AI systems are accurate, fair, and safe. The guide highlights the importance of a rich data environment and encourages public-private data sharing. By making selected government data available and promoting interoperability between national data protection frameworks, Indonesia can improve the accuracy and effectiveness of AI systems. This approach supports innovation and fosters trust and transparency in AI applications. By following the ASEAN Guide, Indonesia aligns itself with regional best practices and global standards in AI governance. This alignment is essential for facilitating cross-border data flows and ensuring Indonesian AI products and services are competitive globally. Moreover, it positions Indonesia as a leader in AI governance within the ASEAN region.

2.7. Recommendations

Several recommendations could be offered. First, the Indonesian government should consider prioritizing collaboration with the private sector to enhance data center infrastructure. Given the government's limited capacity in developing data centers, leveraging the resources and expertise of private sector companies is essential. This approach would facilitate better connectivity with other countries, ensuring Indonesia's position as a regional hub. Strict data localization requirements would hinder this progress, especially since the country's infrastructure still requires significant improvement.

Second, establish a clear timeline for phasing out protections for local industries to allow competition and innovation to flourish. The development of data centers requires bespoke hardware and specialized infrastructure. While import restriction is a valid policy to protect domestic industries, it should be implemented in stages, looking at the readiness of domestic supply to meet the market demand, considering the readiness of industries and the availability of hardware in the country. A well-defined timeline for phasing out protections will encourage local industries to become competitive and self-sufficient while ensuring that the overall development of data centers is not compromised. Restrictive import policies will only counter the development of data centers in Indonesia. Conversely, an enabling regulatory landscape that streamlines the regulatory process—such as simplifying permit procedures, promoting legal certainty, and offering financial incentives for private sector investments in data centers and connectivity—will reduce barriers to developing digital infrastructure. This enabling landscape should have policies that provide room for innovation, are responsive to industry

practice, and are supportive of sustainability, such as by greater and more affordable access to renewable energy.

Third, the government should consider streamlining the licensing and permitting process. The government could provide an option for companies to expedite the permit process with additional requirements. Another option is to establish a paperwork-based process for re-certification of hardware and infrastructure that has already entered the country.

Fourth, MoCI should transition from its operational role in the digital sector to a focus on regulation and oversight. By stepping back from its operational responsibilities, the MoCI would no longer be burdened by non-tax state revenue (PNBP) targets. This shift could result in more competitive spectrum pricing, which would level the playing field and stimulate greater private sector involvement in Indonesia's digital transformation initiatives.

Fifth, the government should consider establishing a dedicated unit to coordinate and supervise digital transformation efforts under MoCI. This unit will facilitate the coordination of different stakeholders and ministries, without creating bureaucracy.

Sixth, the government needs to act as a facilitator when it comes to the adoption of emerging technologies. Indonesia needs to be more proactive in providing the latest telecommunication infrastructure technologies, such as 5G and Wi-Fi, in order to enable innovations in new digital technologies and realize the economic potential of Indonesia in 2045. The government needs to accelerate the release of 5G and WiFi spectrum by providing incentives for operators or other companies to deploy the technology.

3. Data Governance

Key Highlights:

- Indonesia's Personal Data Protection (PDP) Law No. 27 of 2022, while comprehensive, faces challenges due to the short response time it provides for data controllers, its overly broad data breach notification requirements, and its unclear cross-border data transfer mechanisms. The lack of a dedicated PDP Agency also creates uncertainty and hampers effective enforcement.
- The European Union's GDPR provides a model for effective data governance with clear rules on data protection, breach notifications, and cross-border data transfers. Adopting similar standards in Indonesia could improve data security, compliance, and alignment with international norms.
- The Indonesian government should consider refining cross-border data transfer rules, clarifying the role of the PDP Agency, aligning regulations with international best practices like the GDPR, and clearly differentiating the responsibilities of data controllers and processors.

3.1. Issues with Current Regulation

Law No. 27 of 2022 Regarding Personal Data Protection and Implementing Regulations

As part of its digitalization drive, Indonesia's Law No. 27 of 2022 Regarding Personal Data Protection (PDP Law) was passed to address the previously fragmented regulatory landscape and provide a comprehensive approach to personal data protection (Deloitte, 2022). It

addresses the fundamental principles of data governance, roles, responsibilities, and the rules of sanctions and compliance. At its core, the PDP Law grants subjects various rights, ranging from securing information on collecting and processing to filing civil lawsuits. It defines the right of the data subjects to secure information relating to their identities, legal basis, and the purposes that underlie requests for and the utilization of their data by requesting parties. A draft implementing regulation has been published containing additional provisions for its technical implementations and clarifications for specific provisions in the law.

Roles and Responsibility of Data Controllers and Data Processors

The PDP Law distinguishes between data controllers and data processors. A data controller is defined as any entity (individual, public institution, or organization) that determines the purpose and oversees the processing of personal data. In contrast, a data processor is any entity (individual, public institution, or organization) that processes personal data on behalf of the data controller. Both roles come with specific rights and responsibilities under the PDP Law.

To further clarify the roles of data controllers and data processors, consider the following analogy: data controllers are like tenants, while data processors are akin to property owners who share specific responsibilities but have distinct roles. The data processor is responsible for providing secure infrastructure, both physical, such as high-quality servers and cables, and architectural, such as data protection features like encryption, that ensures data security and prevents unauthorized access. However, data processors do not have visibility into the data they handle and cannot distinguish personal data from other types of data. Despite this, the PDP Law imposes obligations and potential sanctions on data processors, creating legal uncertainty, as they lack the ability to view or access the data they are responsible for securing.

Inadequate Time for Data Controllers to Respond to Requests

Under the PDP Law, a three-day timeline is imposed (3x24) for the data controller to respond to users' requests, such as for data access, withdrawing consent, and restricting data use, as well as notification of data breaches. Given the tasks' complexity, the timeframe to respond to such requests is too short. The article does not provide clarifications regarding the basis and viability of the request. The timeline is challenging as the controller will require a reasonable period to search through databases and then respond to the data subject. Approving such a request requires time to determine whether the controller controls the relevant data, verify the legal basis and requirement, revise the details, and respond to the request. These do not include the difficulties in fulfilling such requests, especially with the possibility of involving complex scenarios. Furthermore, certain legal aspects must be followed, and the subject is also under the scope of the data controller’s legal rights.

Broad Scope of Mandatory Data Breach Notification

The mandatory data breach notification threshold is too broad and too low, which risks inundating data subjects with notifications that have minimal or no risks. The threshold should

consider the scale and severity of the breach, such as economic loss to data subjects. Moreover, there is a three-day timeframe for the data controller to notify the PDP agency in case of a data breach. This could hinder an effective response to the occurrence of a data breach. In some cases, the requirement for data controllers to disclose the data breach affecting public services and its impact on the public is not detailed. A more selective notification threshold will focus data subjects' attention on matters requiring their greatest attention and mitigation. Furthermore, the reporting timeframe can be better utilized to conduct investigations and implement mitigation measures.

Need for Clear Cross-Border Data Transfer (CBDT) Mechanisms

The principles of CBDT apply to the transfer of data to areas outside the jurisdiction of Indonesia's law. The PDP Law obliges data controllers to follow a hierarchal basis of data protection, which means they can transfer data across borders if the recipient is under a jurisdiction that has more robust data protection. Otherwise, the data controller must ensure the recipient possesses binding and adequate data protection measures.

The implementing regulation should also recognize relevant frameworks for multinational cross-border data flows. These can include, but are not limited to, the OECD Guidelines on the Protection of Privacy and Trans-Border Flows of Personal Data, the APEC Privacy Framework, the APEC Cross-Border Privacy Rules (CBPR) System, the Global CBPR Forum, and the use of standard contractual clauses (e.g., ASEAN Model Contractual Clauses). It is imperative that the CBDT regulatory framework applies the general provisions of the interoperable certification mechanisms and accountability principles and minimizes administrative burden for the parties involved.

Need for Regulatory Basis to Establish the PDP Agency

The PDP law mandates the establishment of a PDP Agency, which will be responsible to the president of Indonesia. This requires the issuance of a presidential regulation. It is essential that the PDP Agency's rule-making powers and authority are clearly and consistently defined to avoid uncertainty and increase compliance costs. One area of concern is the right to conduct inspections and searches of electronic systems, facilities, rooms, and/or places used by the Personal Data Controller and/or Personal Data Processor, including obtaining access to data. It is essential to include mechanisms for due process, such as conducting thorough consultations with all stakeholders to ensure that the rules are applicable and that stakeholders' interests are protected.

Child Protection Data Governance

The regulatory framework for protecting children's data can be enhanced by ensuring the consistency and clarity of laws. Key areas of concern include defining a child under the law, using a risk-based approach for age verification, addressing objections and implementing sanctions, and a transition period for stakeholders to adapt. The law should reduce regulatory

uncertainty by incorporating digital age consent (i.e., 13 years) as the age limit for children, in line with the Best Interest of Children (BOIC) principle. The law should also include the types of personal data classified as children's personal data. The regulatory approach to age verification requirements should be proportional and risk-based, tailored to children's online experiences and development age, as different online services have varying risk profiles.

3.2. Best Practices for Data Governance

One regulation that can be used as a reference for cybersecurity and data governance issues is the EU GDPR, a comprehensive data protection law that came into force in the European Union on May 25, 2018. This law replaced the previous EU Data Protection Directive and standard data protection laws in the 27 EU member states. The GDPR applies to all companies that handle the personal data of EU residents.

The GDPR establishes rules for organizations to adhere to when processing personal data in the EU or the personal data of EU citizens. It also promotes the free movement of personal data within the EU. To ensure compliance, the EU GDPR has designed a non-compliance fine scheme around the security of individual data, which is divided into two tiers. Minor offenses can be subject to a fine of EUR 10 million (IDR 172 billion) or 2% of the company's annual revenue from the previous financial year (the higher amount will be preferred). Meanwhile, serious violations can be subject to a fine of EUR 20 million or 4% of the company's annual revenue from the previous financial year (the higher amount will be chosen). The GDPR includes stringent requirements for clinical evaluation, post-market surveillance, and traceability (European Data Commission Board, n.d.). These measures ensure that devices meet high-performance standards and continue to provide safe and effective outcomes throughout their lifecycle.

The implementation of the exemplary scheme in the EU GDPR encourages the alignment of incentive mechanisms so that companies are motivated to comply and safeguard the individual data they hold. If similar regulations are implemented in Indonesia, companies, in general, will be encouraged to increase the security and protection of consumer data along with increased transparency. It should also be noted that strengthening regulatory aspects to encourage companies to be more transparent and increase their security regarding consumer data needs to be accompanied by optimal implementation and enforcement efforts.

3.3. Recommendations

Considering the current circumstances, recommendations could be formulated to enhance Indonesia's data governance landscape and regulations.

First, the government should consider reducing restrictions on cross-border data flows and transfers. Ideally, data should be transferred with minimal restrictions for AI modeling purposes. Restrictions on cross-border data transfers will weaken Indonesia's position as a potential hub for AI research and development.

Second, the government should consider aiming to uphold the highest levels of data protection, such as by safeguarding against unauthorized access and modifications. Currently,

data processors do not have visibility into the specific nature of the data they process from data controllers, which complicates the implementation of PDP regulations.

Third, the establishment and responsibilities of the PDP agency should be clearly defined. For instance, it should be made clear whether the PDP agency will be attached to any specific ministry and what the scope of its authority is in terms of securing data. More detailed information is required for drafting regulations for the PDP agency, including the institution's responsibilities and the effectiveness of practices in managing data breaches.

Fourth, PDP regulations should clearly distinguish between the obligations of data controllers and data processors. PDP regulations should also adopt GDPR practices to increase governance efficiency by removing the obligation to notify data subjects when data is transferred, which adds administrative burdens and costs. In contrast, GDPR regulates notifications based on a sufficient legal basis, with consent required under specific conditions.

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Chapter VI

Trade Facilitation Sector

1. E-Commerce Sector

Key Highlights

- The e-commerce sector in Indonesia has experienced significant growth in recent years and is expected to continue expanding. According to Statistics Indonesia (BPS), the number of businesses involved in e-commerce reached 2.9 million in 2023, marking a 4.46% increase from the previous year. Small and medium-sized enterprises (SMEs) with annual revenue below IDR 300 million comprise 82.97% of the total e-commerce players in Indonesia.
- Indonesia's high internet penetration rates have catalyzed the growth of the digital economy. E-commerce has empowered SMEs and helped businesses become more competitive by leveraging digital tools to innovate, extend market reach, boost customer engagement, and drive supply chain management efficiencies. According to the e-Conomy SEA 2023 report by Google, Temasek, and Bain & Company, government regulators heavily influence the direction of key digital economy sectors in Indonesia (Bain and Company, 2023).
- Excessive protection in the e-commerce sector impedes foreign investment in the country's digital economy and limits long-term economic growth. Banning e-commerce imports below USD 100 (IDR 1.6 million)[55] under Ministry of Trade (MoT) Regulation No. 31/2023[56] has negative implications for the wider e-commerce sector and its partners. The implementation of Regulation 31 has dampened the growth of e-commerce platforms that have served the needs of Indonesian customers in harmony with the local industry.
- While the regulation benefits local SMEs in the short term, it does little to support long-term sustainable growth and limits consumer choices. Local industry experts say it is more productive for the government to invest in public-private sector partnership programs and initiatives to help develop SME capabilities and drive international growth.
- Indonesia's concerns regarding the fast-growing social commerce market are valid and shared by other countries in Southeast Asia. However, banning foreign merchants from selling any goods valued below USD 100 directly to Indonesian consumers through online marketplaces discriminates against foreign participation in the Indonesian market.
- We recommend removing the USD 100 floor price on e-commerce imports and instead re-evaluate imposing a value-added tax (VAT) on all e-commerce imports, similar to what other countries have implemented.

1.1 Overview

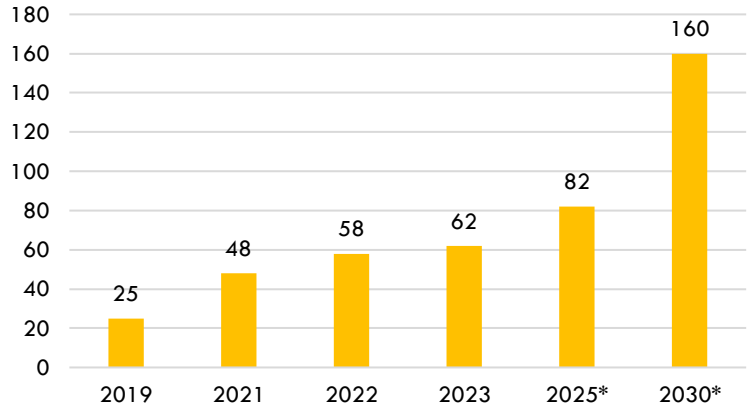
The e-commerce industry in Indonesia has seen significant growth in recent years and is projected to continue expanding. Technological innovation and the increasing use of the internet have been key drivers of the growth of e-commerce (Damuri et al., 2021), further

[55] USD 1 = IDR 16,000

[56] Ministry of Trade No. 31/2023 on Business Licensing, Advertising, Guidance, and Supervision of Business Actors in Trade via Electronic Systems

spurred by an expanding middle class, increased access to mobile devices, and the rapid development of fintech and alternative financing options (OOSGA, 2023). These factors have increased the availability of goods and services in the country, aligned with growing domestic demands. According to Statista (2023), annual gross merchandise volume (GMV), or the total value of goods sold through customer-to-customer (C2C) marketplaces in Indonesia, has increased significantly since 2019. The number is projected to reach USD 82 billion in 2025 and USD 160 billion by 2030.

Figure 1: GMV of e-Commerce Market in Indonesia 2019-2030 (USD billion)



Source: Statista (2023) (*projected)

According to Statistics Indonesia (BPS), the number of businesses involved in e-commerce reached 2.9 million in 2023, a 4.46% increase from the previous year. Small and medium-sized enterprises (SMEs) with annual revenue below IDR 300 million comprise 82.97% of the total e-commerce players in Indonesia.

Indonesia's high internet penetration rates have accelerated the growth of Indonesia's digital economy and empowered SMEs, helping them become more competitive by leveraging digital tools to innovate, extend market reach, boost customer engagement, and drive supply chain management efficiencies. Consumer behavior and preferences have also evolved, with more people opting for the convenience and ease of shopping online (Dewi & Lusikooy, 2024).

By leveraging e-commerce platforms, SMEs are better able to build their business and grow their brands locally and internationally. Promoting an open e-commerce environment that embraces global industry best practices is important to foster innovation and promote a level playing field for both local and foreign businesses to thrive.

1.2 Import Restrictions on E-Commerce

On September 25, 2023, the Minister of Trade issued Regulation No. 31/2023 on Business Licensing, Advertising, Guidance, and Supervision of Business Actors in Trade via Electronic Systems (Regulation 31). This regulation revokes and replaces the previous regulation governing the e-commerce sector (MoT Regulation No. 50/2020), with key changes falling

under three aspects: (1) Classifications of e-commerce business models, (2) Business license requirements, and (3) New e-commerce trade restrictions.

Regulation 31 distinguishes between online marketplaces and social commerce platforms. It categorizes e-commerce models into online retail, marketplaces, classified ads, price comparison platforms, daily deals, and social commerce. It also maintains the existing requirements for foreign merchants who conduct trade through electronic systems (*Perdagangan Melalui Sistem Elektronik*, PMSE) and those who provide electronic systems that facilitate online trade or e-commerce (*Penyelenggara Perdagangan Melalui Sistem Elektronik,* PPMSE).

Several new restrictions have been introduced through Regulation 31, imposing additional requirements on the activities of e-commerce platforms, particularly for e-commerce activities conducted within social media platforms (Akset, 2023). These include:

1) Article 13: A PPMSE must ensure that no electronic systems for e-commerce purposes are connected or interconnected with any other electronic systems operating outside the e-commerce facility.
2) Article 19: A PPMSE engaged in cross-border trading must apply a minimum Freight on Board price of USD 100 per unit to finished goods of foreign origin when shipped directly to Indonesia. The MoT may create a Positive List to specify the imported goods allowed to be sold directly from abroad.
3) Article 21: PMSEs with marketplace and/or social-commerce business models are prohibited from functioning as manufacturers. Social commerce platforms are also prohibited from facilitating payment transactions within their systems.
4) Article 37: A foreign PPMSE's The Representative Office of a Foreign Trading Company (Kantor Perwakilan Perusahaan Perdagangan Asing, KP3A) may not represent more than one foreign PPMSE.

According to an independent council for Indonesia's services sector, the overall intent of Regulation 31 is to manage the influx of low-value e-commerce imports into the country, which has placed significant pressure on Indonesia's customs management systems (Aji, 2023). The government also wants to ensure that e-commerce imports comply with product and food safety requirements, such as the Indonesian National Standard (SNI) and halal certifications. However, experts suggest that instead of issuing a blanket ban on all low-value goods under USD 100 and imposing excessive enforcement that impedes cross-border e-commerce growth, the government should consider creating a streamlined system that simplifies customs clearance for such e-commerce imports.

Industry experts have also raised concerns about the unintended consequences and effectiveness of Regulation 31. While its primary goal is to protect and enhance the competitiveness of local SMEs, its effectiveness is limited to the short term. In the long term, it may hinder the potential growth and competitiveness of local SMEs vis-à-vis their foreign counterparts. To support SME development, the government could instead establish public-private partnerships for programs that help SMEs upskill, harness digital tools, and enhance their capabilities. This would foster their growth and competitiveness, with e-commerce platforms serving as conduits to help local SMEs reach customers worldwide.

Regulation 31 has also resulted in limited customer choices and raised overall prices for consumer goods (Putra, 2023). Indonesian customers are tech-savvy and increasingly rely on e-commerce to shop for everyday needs (US International Trade Administrastion, 2024). Many are also influenced by global trends and foreign products and often turn to e-commerce platforms, which offer a wide range of foreign and local products to satisfy their demands. However, Indonesian consumers have observed that their preferred products online have become more limited and more expensive after the implementation of Regulation 31 (see Feature). This has forced consumers to purchase local alternatives from physical stores, which tend to be more expensive due to markups by local distributors.

Indonesia's reputation as a country that welcomes foreign investment has also been affected by the implementation of Regulation 31. Various foreign industry associations have raised concerns about how the regulation discriminates against foreign participation in Indonesia's digital economy and noted that the USD 100 threshold is arbitrary and lacks basis. These associations recommended that, instead of taking a discriminatory approach, the government should cultivate an e-commerce environment that adopts global industry best practices, encourages innovation, and creates a level playing field for both local and foreign businesses to succeed.

On E-Commerce Balance: Between MSMEs and Consumers

Ikhsan, a 35-year-old data analyst in Jakarta, enjoys browsing e-commerce platforms for car accessories and laptop parts—items that can be hard to find locally. He used to find affordable, high-quality products from international sellers, but since January 2024, his options have dwindled.

"I've noticed that the availability of the products I want is now more limited; there aren't as many options anymore. When I do find local alternatives, they're often more expensive," he says.

This change was brought about by a Ministry of Trade regulation known as Regulation 31, which introduced a USD 100 minimum on imported goods sold directly through e-commerce platforms. The regulation was ostensibly designed to protect Indonesian manufacturers from the surge of cheap imports sold online, but consumers like Ikhsan are left wondering if their interests are also being considered.

According to the National Consumer Associations (YLKI), which supported the regulation, Regulation 31 was a response to the rise of ultra-low-priced goods, which had been putting traditional market sellers out of competition. It was also aimed at improving consumer protections in the e-commerce space by reducing fraudulent activities and the influx of substandard products into Indonesia.

Devi Ariyani, executive director of the Indonesia Service Dialogue (ISD), which advocates for regulatory reforms to promote the growth of Indonesia's services industry, adds that the regulation was not meant to restrict imports, but rather to better control the flow and improve the quality of products coming into the country.

"From ISD's perspective, the regulation has its pros and cons. While the regulation has some positive effects, it also has some potential unintended consequences," Devi says. "For

example, consumers might have fewer choices if overseas suppliers decide to stop selling in Indonesia due to the regulatory burdens. Consumer prices could also rise because suppliers might pass on the additional costs of complying with regulations and using local distributors."

The protectionism approach, while seen as beneficial to local suppliers, does little to support the sustainable growth of Indonesia's MSMEs. "Protectionist measures should not be permanent. There must be a time limit, whether it's three years or five years, until they become competitive—they cannot be protected forever," Devi says.

Instead of shielding local MSMEs from competition and limiting consumer choices, experts say it is more productive for the government to invest in programs and initiatives that help develop their capabilities and support their growth.

"MSMEs need to be provided with assistance to improve the quality standards of their products so they can be competitive," Devi adds. "Many of them have yet to fully meet current regulations and standards, such as intellectual property registration and quality or efficacy testing."

They also need training in digital skills and support in navigating other areas, such as online advertising and logistics. This would allow them to take advantage of e-commerce platforms, which present an untapped opportunity for Indonesian MSMEs to export their products globally, promoting "Made-in-Indonesia" brands to an international audience.

Consumers like Ikhsan hope the government will re-evaluate Regulation 31 soon, particularly the application of the USD 100 threshold. Recently, he purchased a CCTV camera and now worries that should it need replacement parts, he may face difficulties finding them due to the restrictions.

While Ikhsan supports the growth of SMEs, he hopes the government will listen: "Please don't limit consumer choices."

1.2.1 Cross-Border E-Commerce Growth in Southeast Asia

Cross-border e-commerce growth in Southeast Asia is projected to be worth USD 762.6 billion by 2030, with Vietnam, Thailand, and the Philippines expected to more than double their e-commerce market values (US International Trade of Administration, n.d.)

According to Momentum Works (2024), Vietnam and Thailand experienced the most significant e-commerce growth in 2023, with their respective GMVs rising by 52.9% and 34.1% year-on-year. In contrast, Indonesia only grew at a rate of 3.7%, with its share of the total GMV in Southeast Asia decreasing to 46.9% in 2023 from 54% in 2022.

1.2.2 Leveraging E-Commerce to Support SME Growth

Indonesia is home to more than 64 million SMEs, which contribute to 61% of the country's GDP (Sinaga, 2024) and account for nearly 97% of domestic employment. However, the export value of Indonesian SMEs lags behind Thailand and Malaysia (ADB, 2020). To support the growth and development of local SMEs, countries such as Vietnam, Thailand, Malaysia, and

Singapore offer supportive programs and incentives that encourage SMEs to leverage cross-border e-commerce opportunities and internationalize to boost their overall competitiveness with their foreign peers (see country case studies below).

The US-ASEAN Business Council (USABC) has also been working with various ASEAN governments to empower SMEs. USABC and its members are committed to supporting ASEAN SMEs' competitiveness by enhancing their business skills and digital capabilities and facilitating regional trade. In collaboration with relevant ministries or agencies, a total of 84 workshops focused on enhancing SMEs' capacity for exports have been conducted across all 10 ASEAN countries, covering technical processes such as shipment, warehouse management, and customs procedures, as well as promotional strategies for exports and the use of e-commerce platforms for conducting export activities.

1.2.3 Country Case Studies

Vietnam

Vietnam has actively promoted the internationalization of its SMEs. Policies such as the Master Plan for Vietnam's Trade Development emphasize the diversification of export products and markets and the importance of connecting Vietnamese SMEs to global supply chains (Safari & Saleh, 2020). This strategic focus on value-added manufacturing and industrial products is aimed at encouraging its SMEs to move away from low-cost commodity exports and enhancing their competitiveness and growth potential in international markets.

The Vietnamese government has also launched its National E-Commerce Development Program (2021-2025), with e-commerce platforms being leveraged to support key export industries and to promote e-commerce development in various localities. The program also aims to have 50% of SMEs conduct business on e-commerce platforms by 2025, with the Ministry of Industry and Trade supporting SMEs through "Vietnam National Pavilions" on major e-commerce platforms. The ministry provides logistical, financial, and marketing support to Vietnamese exporters participating in these pavilions (Vietnam's Ministry of Industry and Trade, 2020).

Thailand

The Thai government recognizes the significant role of e-commerce in boosting exports and wants to harness its local brands and products produced under its One Tambon, One Product (OTOP) initiative to boost its international soft power, a key strategic pillar under its new administration.

Thailand supports its SMEs through the Office of Small and Medium Enterprises Promotion (OSMEP), which implements the SME Promotion Plan under the Small and Medium Enterprises Promotion Act. The Plan aims to enhance the competitiveness of SMEs and increase their contribution to Thailand's GDP. The fifth SME Promotion Master Plan (2023–2027) sets out a vision to make Thailand home to strong, high potential, and competitive SMEs through: (1) Comprehensive promotion, focusing on inclusive development for all SME sectors; (2) Creating market opportunities through government procurement, and access to

global value chains; and (3) Developing ecosystems to reduce SME obstacles in doing business such as improving access to finance, technology and innovation, labor readiness, big data, law and regulation, and information for policy formulation (ADB, 2023).

Malaysia

Malaysia's New Industrial Master Plan (NIMP) 2030 places a strong emphasis on enhancing domestic direct investment, particularly from SMEs, by fostering innovation and sustainable development with digitalization at its core (Malaysia Investment Development Authority, 2024). It encourages the adoption of advanced technologies to enhance productivity and competitiveness, while also fostering partnerships, promoting investment, and creating an enabling environment for businesses to thrive in both domestic and international markets (Ministry of Investment, Trade, and Industry Malaysia, 2023).

To enhance Malaysia's competitive edge in international trade, Malaysia's National Trade Blueprint (NTBp) sets out a five-year strategy (2021-2025) aimed at strengthening Malaysia's export growth by expanding market access and facilitating cross-border e-commerce (Ministry of International Trade and Industry Malaysia, 2021).

Further, Malaysia's Market Readiness Program by MATRADE, the national trade promotion agency under the Ministry of Investment, Trade and Industry, facilitates the international expansion of SMEs, enabling them to explore global markets and enhance export capabilities through targeted training and support (Malaysia Investment Development Authority, 2024; National Trade Promotion Agency of Malaysia, 2023; The Star, 2022).

The National Entrepreneur and SME Development Council (NESDC) is the highest policy-making authority for SMEs in Malaysia and is tasked with the overall development of SMEs across all sectors of the country's economy. NESDC coordinates efforts to boost SME capabilities through financial incentives, technical assistance, and export promotion programs. The Ministry of Entrepreneur and Cooperatives Development's central coordinating agency, SME Corporation Malaysia, is also crucial in these efforts, and provides business advisory services for SMEs and entrepreneurs to enhance SMEs' competitiveness in global markets (NSDC, 2021).

Singapore

The Infocomm Media Development Authority (IMDA) SMEs Go Digital Programme, launched in 2017, aims to make digital adoption easier for SMEs through various forms of support, including (1) Start Digital Pack, offering SMEs a range of digital solutions to help kickstart their digital, focusing on accounting, human resources, and digital marketing; (2) Consultancy services, which provides SME access to digital business; (3) Government grants, or financial support to subsidize the cost of adopting digital technologies; (4) Digital Resilience Bonus, additional incentives for SMEs that adopt digital solutions in key areas such as e-commerce and digital payments; and (5) Advanced Digital Solutions, to deepen SMEs capabilities and helps businesses leverage technologies such as artificial intelligence and data analytics. Under the SMEs Go Digital Programme, IMDA also launched a Grow Digital initiative for SMEs to go international through participation in pre-approved e-commerce platforms, allowing them to

sell overseas without a need for physical presence (Infocomm Media Development Authority, 2022). Under the initiative, SMEs benefit from easy access to financing offers facilitated via the platforms, cross-border e-payment facilities that alleviate currency risk, and training and support to build competencies for cross-border e-commerce.

1.3 Recommendations

As Regulation 31 covers several aspects, we make the following recommendations to promote an e-commerce environment that embraces global industry best practices, fosters innovation, and creates a level playing field for both local and foreign businesses to thrive.

1. Remove the USD 100 ban on e-commerce imports.	
Issues	Recommendation
• Foreign merchants are prohibited from selling any goods valued below USD 100 to Indonesian customers through e-commerce platforms. Such a policy is discriminatory to foreign participation in the Indonesian market and there is no basis for the selection of such an arbitrary threshold. • Neighboring governments have refrained from imposing trade restrictions that hinder the growth of e-commerce in their countries. For instance, in response to the growth of cross-border e-commerce transactions, Thailand removed its de minimis threshold on July 5, 2024, and imposed a 7% VAT on all e-commerce imports. Previously, goods sold for less than THB 1,500 Baht or USD 40 were exempt from VAT. Similarly, Vietnam is also considering imposing VAT on all imported goods sold via e-commerce.	• We ask that the government remove the USD 100 ban on e-commerce imports and instead consider imposing the optimum level of VAT on all imported e-commerce goods. • These actions will serve as an important lever to boost the overall competitiveness of local SMEs against their foreign counterparts and allow for a more vibrant e-commerce landscape that promotes better customer choices and competitive prices for Indonesian consumers.
2. Empower local SMEs and support their growth both locally and internationally.	
Issue	Recommendation
• Indonesia has over 65.5 million SMEs that account for 61% of the country's GDP, but many face challenges in	• We encourage the government to partner and leverage foreign e-commerce platforms to inspire,

participating in the digital economy. Foreign e-commerce platforms can serve as valuable partners to the government in terms of supporting SME digital development. By providing training and enhancing capabilities, these platforms can help SMEs grow and expand their customer reach to international markets by leveraging cross-border e-commerce opportunities.	engage, educate and connect Indonesian SMEs to customers worldwide, and grow Indonesian brands globally.
3. Cultivate an open e-commerce environment that adopts global industry best practices, encourages innovation, and creates a level playing field for both local and foreign businesses to succeed.	
Issue	Recommendation
• Restrictive trade policies such as Regulation 31 create a complex and often fragmented policy landscape that impedes innovation and deters foreign investment into Indonesia's digital economy. • Regulation 31 was swiftly enacted with very limited opportunities for public consultation on how it would impact Indonesia's broader e-commerce ecosystem, local industries, and Indonesian customers.	• We recommend that the government review Regulation 31 and seek both public and industry views, including from foreign associations, on the overall efficacy of the regulation vis-à-vis its original intent. • We recommend deepening public-private sector dialogue and partnership on the benefits of cross-border e-commerce and work closely with e-commerce platforms toward mutually beneficial outcomes in support of Indonesia's growing digital economy and local communities.

2. Import Policies

Key Highlights

- Indonesia's import policy and trade restrictions have significantly changed in recent years, particularly in terms of non-tariff barriers. One of the main changes is the issuance of MoT Regulation No. 36/2023, which aims to clarify and improve import procedures in Indonesia. In practice, however, it tightened import restrictions and added import licensing requirements in the form of technical approvals (Pertek).
- MoT has already revised the rules regarding imported goods three times and may soon revise them for the fourth time due to significant backlash from companies and consumers. The frequent changes in import policy, which indicate there is no higher-level ecosystem strategy in place, have created massive legal and business uncertainty for all stakeholders.
- Trade barriers can increase the cost of imported goods, limit access to high-quality products, and lead to delays and increased costs for companies that rely on global supply networks. This can ultimately affect the competitiveness of Indonesian industries in the global market. Thus, trade policies should be reshaped to promote growth and prosperity.

2.1 Overview

One of the core aspects of Indonesia's import policy is the protection of domestic industries. To achieve this, the government has imposed tariffs and non-tariff barriers on various imported goods. These measures aim to shield local manufacturers from foreign competition and encourage the growth of homegrown industries. For instance, high tariffs are levied on imported products that compete directly with locally produced goods, such as textiles, electronics, and automotive parts. Indonesia also employs non-tariff barriers like import quotas, licensing requirements, and stringent standards for certain products. Moreover, Indonesia is considering relocating the customs clearance process to ports in eastern Indonesia for certain commodities, to make imported goods more expensive and more complicated to obtain. These barriers can complicate the import process, making it more challenging and costly for foreign companies to enter the Indonesian market.

Indonesia's import policy and trade restrictions have significantly changed in recent years, particularly in terms of non-tariff barriers. One of the main changes is the issuance of MoT Regulation No. 36/2023 on Import Policies and Arrangements (Regulation 36), which became effective on March 10, 2024. This regulation introduced substantial changes to clarify and improve import policies and arrangements. However, in practice, it tightened import restrictions and added import licensing requirements in the form of technical approvals (*Persetujuan Teknis*, Pertek). In addition, Indonesia restricts imports via e-commerce platforms under Regulation 31.

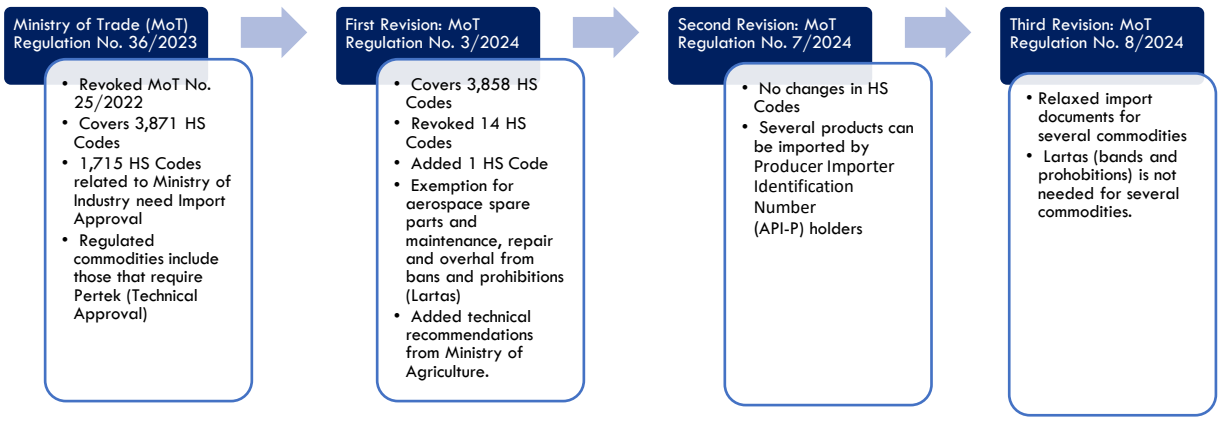
The government's import restrictions on a wide range of products have faced significant backlash from both companies and consumers. Consequently, within a two-month period, the MoT revised its import rules three times, creating massive legal and business uncertainty for all stakeholders.

This could be a major impediment to long-term growth and development. Trade barriers can increase the cost of imported goods, making them more expensive for consumers and limiting their access to high-quality products. Moreover, companies that rely on global supply networks may find it challenging to comply with these regulations, leading to delays and higher costs. This can ultimately affect the competitiveness of Indonesian industries in the global market. Thus, trade policies should be reshaped to promote growth and prosperity. Domestic policies to address trade-related adjustments are crucial to ensuring that the gains from trade are inclusive (World Bank, 2022). Trade reforms are critical to unleashing the benefits of trade for economic growth and the well-being of the Indonesian people.

2.2 Complex Import Procedures

Regulation 36 was issued to clarify and improve import procedures in Indonesia, revoking the government's previous regulation governing import rules.[57] Some of the key provisions from the earlier regulation remain in place under Regulation 36, including the applicability of a Business Identification Number (*Nomor Induk Berusaha,* NIB) as an Importer Identification Number (*Angka Pengenal Importir*, API), and the requirement that importers secure a business license to operate as a Registered Importer, Producer Importer, and/or for Import Approval.

Figure 2: Revisions of Regulation 36



Regulation 36 is generally a set of import licensing procedures that require importers to obtain various documents, such as Pertek, Import Approvals (PI), and Survey Reports (LS). Such import licensing requirements are common non-tariff measures used by governments to regulate the entry of foreign goods into their markets. The World Trade Organization (WTO) defines import licensing as "administrative procedures requiring the submission of an application or other documentation (other than those required for customs purposes) to the relevant administrative body as a prior condition for the importation of goods."

The WTO Agreement on Import Licensing Procedures sets global standards and norms to ensure these practices are transparent, predictable, and fair, aiming to prevent them from becoming unnecessary trade barriers. This agreement classifies import licensing schemes into two main categories: automatic and non-automatic, each with distinct guidelines and

[57] MoT Regulation No. 20/2021 on Import Policies and Arrangements as amended by MoT Regulation No. 25/2022 (MoT, n.d.)

purposes. Automatic licensing is primarily used for monitoring imports and is not intended to restrict the volume of imports. In contrast, non-automatic licensing can be applied for various reasons, including protecting public health and the environment or managing shortages of essential products.

Import licensing practices should adhere to several principles to prevent them from becoming unnecessary trade barriers. According to Article 1 (General Provisions) of the WTO agreement, these principles include transparency, predictability, and fairness. Furthermore, import licensing also serves to address policy objectives, playing a critical role in safeguarding public health by allowing only products that meet specific safety and health standards to enter the domestic market. This is particularly important in the regulation of food, pharmaceuticals, and medical devices.

Many countries require import licenses for pharmaceuticals and medical devices to ensure that only safe, effective, and quality medical products enter the market. For instance, the US Food and Drug Administration (FDA) oversees the importation of pharmaceuticals and medical devices, requiring specific documentation and compliance with regulations to protect public health. By requiring import licenses for these products, governments can verify that they comply with local safety standards and regulations before they reach consumers.

In product safety, import licensing plays a crucial role in preventing the circulation of dangerous goods that do not meet established safety criteria. This includes consumer goods such as toys, electrical appliances, and automobiles, which are subject to strict safety regulations to protect consumers from harm. Through import licensing, authorities can ensure that these products have undergone necessary safety testing and certification before being allowed into the country. This mechanism is crucial for mitigating the risk of accidents and injuries associated with defective or substandard products. By controlling the entry of potentially hazardous goods, import licensing contributes to a safer consumer environment and fosters public trust in the market. In 2020, for example, 25 WTO members introduced import licensing procedures on hazardous chemicals to protect human, animal, or plant life or health (WTO, 2021).

National security is another critical area where import licensing is essential. Countries control the import of strategic materials, such as uranium, and technologies with military applications for this reason. For instance, the US Department of Commerce's Bureau of Industry and Security requires licenses to import certain items that could contribute to the proliferation of weapons of mass destruction or be diverted to unauthorized uses. Import licensing allows governments to regulate the flow of dual-use technologies and materials that could be used to develop weapons. This includes military items and certain chemicals, biological agents, and advanced technologies with both civilian and military applications. Import licensing allows for the careful evaluation of these goods and the entities involved in their trade, helping to prevent their diversion to unauthorized uses or users. In this way, import licensing is vital to national and international security efforts, working alongside export controls to counter proliferation and safeguard national security interests.

Beyond the immediate benefits of protecting health, safety, and security, import licensing has broader implications for public welfare. By enforcing standards through import controls,

governments can encourage domestic and foreign producers to adhere to higher quality and safety standards, improving the quality of products available in the market.

However, the current implementation of Regulation 36 does not align with these fundamental principles. This has led to significant delays, with thousands of containers stuck in ports due to incomplete documentation. The regulation has been revised three times in an attempt to address the backlog of containers, but this has also created considerable legal uncertainty for businesses. Additionally, the allocation of quotas lacks transparency, as illustrated by cases where importers receive less allocation than proposed, without a disclosed formula for determining quotas (CIPS, 2022). This lack of transparency increases the risk of illegal rent-seeking and corruption (Sembiring, 2024).

2.3 Best Practices from Other Countries

2.3.1 International Practices on Import Licensing/Procedures

Transparency is a significant concern within the operations and monitoring of the WTO, particularly with regard to compliance with notification obligations, or the formal requirement for member countries to inform the WTO about specific actions, measures, or policies they are implementing that may affect international trade. Developing countries, such as Indonesia, often find it challenging to meet these complex requirements, and even developed countries sometimes fail to comply or do so selectively. The ability of developing countries to meet these obligations is closely tied to their economic development and resource availability, as highlighted by a WTO communication from the African group, Cuba, and India (TRIPS Council Statement by H.E. Ambassador Lundeg Purevsuren, South Africa) (WTO, n.d.). The constraints on capacity and resources in developing countries are substantial. To meet notification requirements, countries need a comprehensive understanding of various WTO agreements, robust institutional frameworks, and skilled human resources, which are often insufficient in many developing countries.

Efforts in this area should focus on supporting and incentivizing developing countries to overcome these challenges, particularly concerning transparency obligations. Notification requirements should be adjusted to match each member's level of development. Developing countries, Small and Vulnerable Economies (SVEs), and Least Developed Countries (LDCs) should not be expected to meet obligations that exceed their capabilities. This issue was discussed back in 1996 within the Working Group on Notification Obligations and Procedures, where several developing countries pointed out that the growing workload and limited resources in smaller delegations made it difficult to advise their governments on all aspects of the required notifications. They mentioned the complexity and technical nature of the information demanded, creating significant barriers to fulfilling these obligations. Despite recognizing that notifications were part of their WTO membership responsibilities and expressing their willingness to comply to the best of their abilities, they faced severe constraints due to their limited resources.

In addition, the OECD Guidelines for Multinational Enterprises on Responsible Business Conduct (2023) also address the issue of international trade. The guidelines aim to encourage responsible trade and investment and multiply their benefits through continuous engagement

and improvement. In the guidelines, the OECD states that multinational enterprises should avoid entering into or carrying out anti-competitive agreements, such as fixed prices and collusive tenders, and should not establish output restrictions or quotas.

These issues are also relevant to Indonesia, where suboptimal administrative and technical capacity, resource constraints, coordination and governance challenges, and institutional capacity issues characterize the current situation. Increased transparency and awareness are important in import licensing, as states can only start the state-to-state consultation process under free trade agreements (FTA) or WTO mechanisms to resolve import license concerns based on sufficient information.

The Proposed Import License Reporting Mechanism should avoid duplication and aim to complement the existing notification and consultative mechanisms under the WTO and regional/bilateral trade agreements. As the state-to-state consultation process under FTA or WTO mechanisms is already established, there is no need to duplicate the institutional framework. Instead, the Proposed Import License Reporting Mechanism should focus on addressing transparency and awareness. Designing an effective import licensing framework requires coordinated efforts from various stakeholders, including government ministries, agencies, and business chambers.

Below is a mechanism based on what European countries use to implement an import licensing framework, along with the tasks and responsible stakeholders:

Table 3: Tasks and Stakeholders Involved in Import Licensing Framework

Task	Description	Stakeholder
1. Policy Formulation	Define the goals and objectives of the import licensing framework, including protection of domestic industries, consumer safety, and national security.	Ministry of Trade in consultation with relevant ministries (e.g., Agriculture, Health, Industry), and input from business chambers.
2. License Classification	Determine the types of licenses required (automatic, non-automatic, quota-based) and specify which goods fall under each category.	Ministry of Trade, in collaboration with relevant ministries, such as on agriculture, industry, and health, based on product-specific risks and market needs.
3. Application Process Design	Design the application process, including forms, documentation requirements, and electronic submission mechanisms.	Ministry of Trade, in partnership with the IT department or a digital innovation agency, to integrate electronic systems and ensure smooth functioning.
4. Customs Integration	Integrate licensing checks into customs procedures to ensure compliance before goods enter the country.	Customs and excise office, in collaboration with the Ministry of Trade, to ensure seamless integration of licensing checks with customs procedures.

Task	Description	Stakeholder
5. Risk Assessment and Management	Develop a risk-based approach to licensing, ensuring that high-risk goods undergo thorough scrutiny while low-risk goods pass through quickly.	Various ministries, such as on health, agriculture, and industry, in collaboration with customs and excise office, to ensure adequate risk assessment measures for different goods.
6. Enforcement and Compliance Monitoring	Monitor imports for compliance with licensing requirements, investigate violations, and impose penalties as needed.	Ministry of Trade, customs and excise office, and relevant ministries, working together to enforce licensing regulations and deter non-compliance.
7. Stakeholder Engagement	Engage with businesses and trade associations to gather feedback and ensure the framework meets their needs while protecting national interests.	Ministry of Trade, in collaboration with business chambers and trade associations, to ensure ongoing dialogue and feedback.
8. Capacity Building	Train personnel involved in licensing administration, including customs officials, and improve technological infrastructure.	Ministry of Trade, customs and excise office, and digital innovation agencies, in partnership with international organizations (e.g., WTO) or private-sector partners for training and technology development.
9. Periodic Review and Updates	Review the licensing framework periodically, assess its effectiveness, and update policies to reflect changes in market conditions and international trade agreements.	Ministry of Commerce, in consultation with relevant ministries and business chambers, to ensure the framework remains relevant and effective.

Source: ARISE-PLUS (2023)

2.3.2 Lessons from Other Countries

Some of the key elements from other import licensing frameworks that can be considered for the design of Indonesia's import licensing mechanism are as follows:

Table 4: Lessons from Other Import Licensing Reporting Frameworks

Mechanism	Example	Elements to Consider
Electronic Licensing Systems	The European Union (EU) has implemented electronic systems for import licensing, including the TARIC database, which provides information on tariffs and trade measures, including licensing requirements.	These systems streamline the licensing process, reduce paperwork, and provide real-time information on requirements, helping to avoid delays and confusion. The Indonesia National Single Window (INSW) falls under this category. However, the INSW system is facing operational issues due to its unpreparedness to implement Regulation 36 requirements (e.g., certain HS codes were not available in the INSW system).
Automated Customs Procedures	Singapore has developed an efficient customs system that includes TradeNet, an electronic platform for submitting import license applications and customs declarations.	This system enables seamless integration of customs procedures, expediting the licensing process and reducing costs. Other countries can adopt similar systems to improve trade flow and efficiency.
Risk-Based Licensing	Australia has a risk-based licensing system for agricultural imports, requiring licenses only for high-risk goods and reducing unnecessary barriers to trade.	This system helps balance trade facilitation and protection, ensuring only high-risk goods are subject to licensing. Other countries can adopt similar approaches, focusing resources on managing imports that pose significant risks.
Licensing for Consumer Protection	The US implements licensing requirements for goods such as food, drugs, and electronics to ensure they meet safety standards.	This mechanism protects consumers from potentially harmful products. Countries can adopt similar frameworks to enforce quality standards for consumer goods entering their markets.
Trade Agreement Integration	The North American Free Trade Agreement (NAFTA) and its successor, the US-Mexico-Canada Agreement (USMCA), harmonized licensing requirements across member states.	This integration reduces trade barriers, streamlines processes, and ensures that member states have consistent licensing requirements. Other countries can benefit from harmonizing their licensing frameworks with trade partners.

Mechanism	Example	Elements to Consider
Capacity Building for Licensing Administration	Various developing countries, with support from international organizations, have built institutional capacity to manage import licensing effectively.	This includes training personnel, improving technology, and establishing efficient systems to avoid delays and corruption. Capacity-building initiatives can significantly enhance the effectiveness of licensing mechanisms.

2.4 Recommendations

Indonesia currently has a complex import policy with various tariffs and non-tariff barriers, exacerbated by significant and frequent changes over the past few years. While the changes in import policy and trade restrictions are intended to protect domestic consumers and encourage the growth of domestic industries, they increase trade barriers, which could pose a major obstacle to the country's long-term economic growth and development. Therefore, several recommendations are suggested for the government to improve the current import policy.

A. Create a more coherent long-term trade strategy	
Issue	Recommendations
• No higher-level trade ecosystem strategy is in place to ensure the coherence of import policies.	.1 Conduct a holistic ecosystem analysis to guide trade policy strategies. A thorough ecosystem analysis for each sector of the economy can provide insights into how import policies on certain HS codes will impact the broader supply chain, not just the targeted HS code. This is due to the interconnectivity of global supply chains across various products and industries. Such an analysis should also guide the formulation of local content requirements and quota allocations. .2 Ensure import restriction measures are temporary, not permanent. Import restrictions aimed at promoting the growth of domestic industries should be "temporary" in nature and not adopted as the "norm". Protectionist policies, if implemented long term, can have harmful and counterproductive effects on domestic industries, potentially stifling innovation and competitiveness.

B. Increase the quality and transparency of trade policy formulation and implementation	
Issues	Recommendations
• Ministry of Trade regulations have been frequently revised within a short period of time, often as a reactive response to public pressure. • The import system administration is inefficient. • There is a lack of transparency in setting quota allocations.	1. The policymaking process should be guided by a higher-level ecosystem strategy and be conducted more deliberately, with adequate room for public consultation. 2. Ensure that information on tariffs and other trade measures, including licensing requirements and quota allocation processes, is easily accessible. 3. Streamline and integrate the import administration system, including by reducing paperwork and providing real-time information on requirements to avoid delays and confusion.

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Chapter VII

Travel and Tourism Sector

1. Overview of the Sector

Key Highlights

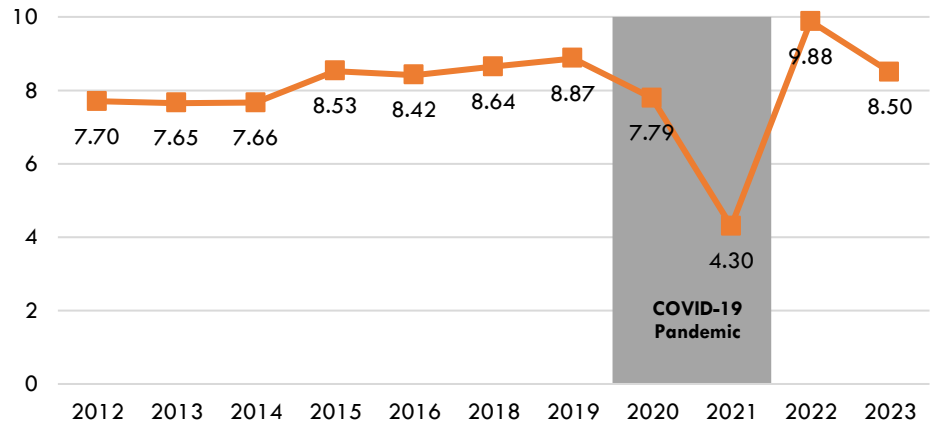
- Tourism is recognized as an important contributor to Indonesia's economic growth, particularly in Bali, where it accounts for approximately 61% of Gross Regional Domestic Product, creating substantial employment opportunities. However, this growth has increasingly been concentrated in certain destinations, especially in southern Bali.
- Sustainable tourism strategies are essential to address the impact of concentrated tourism in certain areas, ensure long-term ecological balance, and harness tourism as a positive force for Indonesia's future.
- The Indonesian government has implemented various policies and regulations to promote sustainable tourism. These include the National Development Plan 2005-2025, Law No. 10 /2009 on Tourism, and the Ministry of Tourism and Creative Economy Regulation No. 9/2021 on Guidelines for Sustainable Tourism Destinations. These policies emphasize the importance of integrating sustainability into tourism development.
- To reduce overcrowding in popular spots like Bali, the Indonesian government has identified five "Super Priority Destinations" as part of its "New Bali" initiative. Additionally, the Tourism Village program, which comprises 6,027 tourism villages across Indonesia, aims to decentralize tourism, promote local economic growth, preserve natural and cultural heritage, and alleviate pressure on traditional hotspots.
- For the Tourism Village program to succeed in addressing the issues created by concentrated tourism, the government needs to ensure the program is accompanied by robust infrastructure development and additional skills training programs for local residents.
- The government can further promote tourism that respects and preserves local culture and the environment through effective marketing and education campaigns targeted at tourists, such as by showcasing intangible cultural heritage and festivals. Finally, fostering collaboration between the government, local communities, and the private sector is pivotal for a more integrated and sustainable tourism development.

The COVID-19 pandemic has catalyzed significant shifts in the travel and tourism industry, giving rise to several megatrends reshaping the sector. One prominent trend is the rise of extended stays and the blending of work and leisure, often called "bleisure" travel. With the increase in remote work capabilities, many individuals opt to spend more extended periods at their travel destinations, combining work responsibilities with leisure activities. The Asian Development Bank (ADB) and UN Tourism (UNWTO) (2022) highlighted the growing popularity of beach destinations offering long-stay packages and remote work-friendly accommodations. Places such as Boracay, Palawan, and Bali have become hotspots for digital nomads who seek to balance productivity with recreation.

Figure 1 provides a detailed overview of the average duration of stay for foreign tourists in Indonesia over time. Notably, the peak occurred in 2022, with foreign tourists spending an average of about 10 days in the country. This represents a significant increase of nearly 30% compared to 2012, when the average stay was 7.7 days. However, this trend was disrupted

during the COVID-19 pandemic in 2020-2021, which severely restricted international travel and affected tourism globally. This led to a sharp decline in the average length of stay to its lowest point of 4.3 days in 2021. Excluding the anomalous COVID-19 period, the data indicates that, prior to 2020, the average length of stay for foreign tourists was 8.21 days per visit. After travel restrictions eased, the average duration of stay rebounded to 9.19 days per visit in 2022-2023, indicating a shift in travel behavior or preferences post-pandemic.

Figure 1: Average Length of Stay by Foreign Tourists (Days)



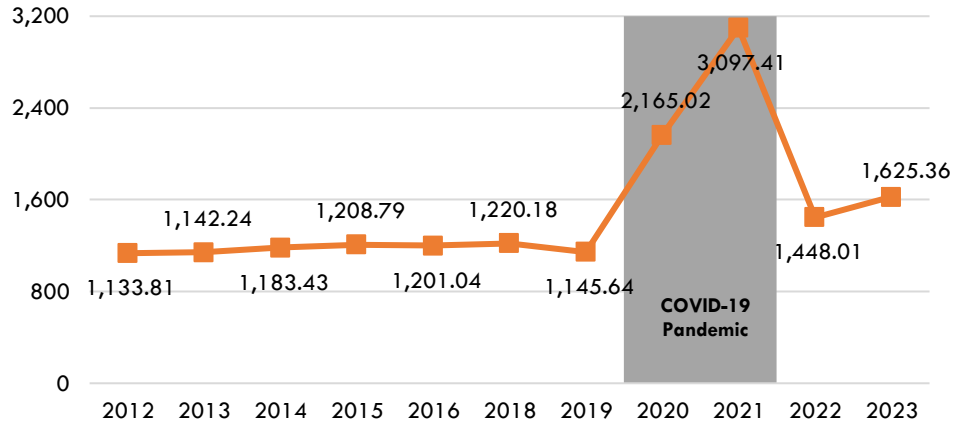
Source: Statistics Indonesia

Extended stays by foreign tourists offer the opportunity to immerse more deeply in local cultures and lifestyles while contributing to the economic well-being of host communities. As travelers spend more time in a destination, their use of local services, facilities, and businesses increases, leading to a more pronounced economic impact. From 2012 to 2023, excluding the COVID-19 pandemic years of 2020-2021, spending by foreign tourists in Indonesia demonstrated an upward trend. Before the pandemic, the average expenditure per visit was USD 1,176.45 (IDR 18.8 million).[58] With tourists staying an average of 8.21 days, this translates to an average daily spending of USD 143.29 per tourist.

The COVID-19 pandemic temporarily disrupted this trend. During the 2020-2021 period, the average length of stay and spending patterns were affected, with increased spending primarily driven by quarantine costs. In the post-pandemic years of 2022-2023, average spending per visit recovered to USD 1,536.39, accompanied by an increase in the average length of stay to 9.19 days. This shift resulted in an increase in average daily spending to USD 167.21 per tourist. The post-pandemic figures suggest that as international travel resumed, tourists not only returned to Indonesia but also spent more per day on average, contributing to the ongoing recovery and growth of the local economy.

[58] USD 1 = IDR 16,000

Figure 2: Average Expenditure Per Visit by Foreign Tourists (USD)



Source: Statistics Indonesia

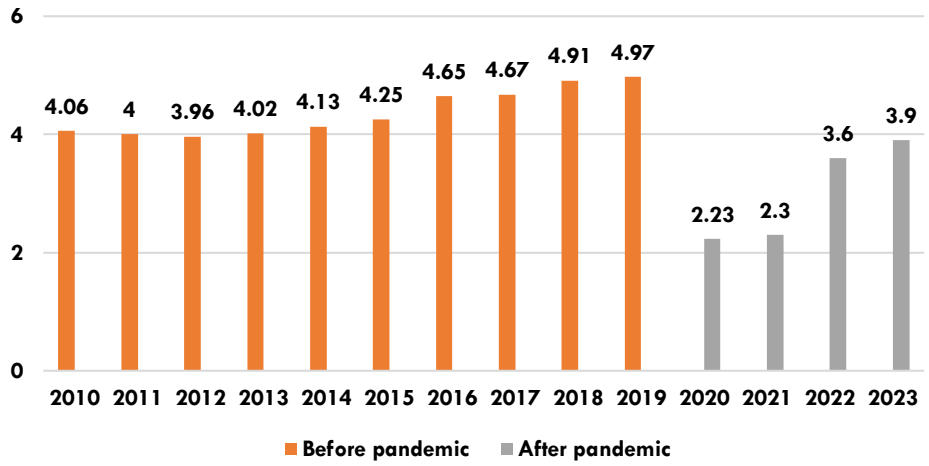
While the global "bleisure" travel trend has positively impacted many destinations, boosting local economies and promoting deeper cultural exchange, it also highlights the challenges of managing increased tourist volumes, particularly in popular areas like Bali. As Bali experiences a surge in both international and domestic tourists, drawn by its appealing remote work facilities and vibrant local culture, it is crucial to consider the implications of such growth.

2. Key Issues

2.1 Overview of Tourism Sector

Between 2010 and 2019, the tourism sector contributed an average of 4.36% to the Indonesian economy. However, in 2020, due to global mobility restrictions aimed at containing the spread of the COVID-19 virus, this figure dropped by more than half to only 2.23%. As the world began to recover from the pandemic, the tourism sector in Indonesia also saw a gradual rebound. By 2023, the sector's contribution had risen to 3.9% of the national GDP, near pre-pandemic levels. In terms of employment, the tourism sector supported 14.96 million jobs in 2019, accounting for about 11.83% of total employment, almost double from 8.02 million jobs in 2011, which made up 7.46% of total employment that year.

Figure 3: Share of Tourism Sector to GDP (%), 2010-2023



Source: Ministry of Tourism and Creative Economy and Indonesia.go.id

In Bali, the impact of tourism on the local economy and its micro, small, and medium enterprises (MSMEs) is profound. Known as the "Island of the Gods," Bali boasts an economy predominantly driven by tourism, which serves as the backbone of its economy. This sector fuels a vibrant service industry, with thriving local businesses catering to millions of travelers and providing numerous jobs. Tourism accounted for approximately 61% of Bali's Gross Regional Domestic Product (GDRP) and employed 328,000 workers in 2019 (Subawa et al, 2022). Not only does tourism drive direct economic growth, but it also supports MSMEs, which play a critical role in providing services and products to visitors (Lei et al., 2023; Antara & Sumarniasih, 2017). Beyond immediate financial gains, tourism creates substantial employment opportunities. Krisnadi & Maharani (2021) suggests that approximately 409 jobs are generated for every 1,000 foreign tourists.

2.2 Concentrated Tourism

Bali remains the most popular gateway to Indonesia, with 44.94% of international visitors entering Indonesia through the island in 2023. Beyond its allure for international visitors, Bali is also a major destination for domestic tourists. In 2023, the island welcomed 9.88 million domestic visitors, equivalent to over 93% of the pre-pandemic level of 10.55 million in 2019. This marked a 22.66% increase from the previous year, highlighting a significant rebound in domestic tourism. However, the surge in tourist numbers brings challenges related to concentrated tourism.

A concentrated tourism destination is a geographic area where tourism activities are densely clustered. In 2023, this issue became more pronounced in Bali, especially in the southern regions of the island. However, this is not a new problem; Bali was already grappling with issues related to high tourist numbers before the pandemic. The large influx of visitors has been linked to several environmental and social issues, such as an accumulation of waste, mainly plastic waste. Additionally, a water crisis exacerbated by drought threatens food

security, the quality of life for residents, and the preservation of traditional culture.[59] Interviews with government officials confirm these findings, indicating that the high volume of tourists is also associated with deteriorating infrastructure and increased congestion.

In September 2024, the Minister of Tourism and Creative Economy, Sandiaga Uno, announced a planned moratorium on the construction of hotels and villas in Bali.[60] This policy aims to regulate the rapid increase in tourism infrastructure, particularly hotels and villas, which is putting pressure on Bali's agricultural land and causing traffic congestion due to the growing number of visitors. The moratorium, which is expected to last for three to five years, will be reviewed for effectiveness during its implementation. The policy is in response to concerns that Bali is reaching its tipping point in terms of development density, particularly in the Sarbagita region (Denpasar, Badung, Gianyar, and Tabanan). Bali Governor Sang Made Mahendra Jaya stressed that the policy is designed to manage land use better, especially to prevent the further conversion of agricultural land into tourism facilities, and not about tightening construction permits. This move comes as Bali suffers increasing infrastructure strain, both in terms of land availability and traffic management, in the face of growing tourism numbers.

A high volume of tourists can impact various aspects of a destination, including environmental, social, economic, and cultural dimensions. In Bali, the environmental effects are particularly concerning, with water scarcity emerging as one of the most urgent challenges. By 2025, it is predicted that Bali will face a clean water deficit, with water needs increasing from around 6,000 liters per second in 2021 to about 8,000 liters per second in 2025 (Ministry of Environment and Forestry, 2021). This rising demand strains the island's water resources, exacerbating the risk of shortages for residents and visitors.

Waste management is another critical concern. In 2023, Bali produced approximately 933,000 tonnes of waste, with 26.58% left unmanaged (Bali Forestry and Environment Agency, 2024).[61] The accumulation of unmanaged waste, especially plastic, poses severe environmental and health risks, polluting the land and water sources and contributing to the island's waste crisis. The declining health of Bali's marine ecosystems further underscores the environmental toll of concentrated tourism. As of 2018, only 55% of Bali’s coral reefs were in good condition, while 30% were declining and 15% were in poor condition (Wiratmini, 2018). The degradation of coral reefs, vital to marine biodiversity and local fisheries, is caused mainly by increased coastal development, pollution, and unsustainable tourism practices. These environmental issues highlight the urgent need for sustainable tourism practices in Bali to preserve its natural resources and ensure long-term ecological balance.

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[59] Siddharta, A. T. (2019, October 14). Bali fights for its beautiful beaches by rethinking waste, plastic trash. *National Geographic*. https://www.nationalgeographic.com/science/article/bali-fights-for-its-beautiful-beaches-by-rethinking-waste-plastic-trash, CNN Indonesia. (2019, December 29). Menilik kelola sampah makanan dan serbuan turis di Ubud. *CNN Indonesia*. https://www.cnnindonesia.com/gaya-hidup/20191229132431-269-460761/menilik-kelola-sampah-makanan-dan-serbuan-turis-di-ubud, Times of India. (2019, December 3). Bali heading toward drought-like situation, over-tourism one of the causes. *Times of India*. https://timesofindia.indiatimes.com/travel/destinations/bali-heading-toward-drought-like-situation-over-tourism-one-of-the-causes/articleshow/72348958.cms

[60] Ginta, Y. V. S., & Susanti, R. (2024, September 21). Sandiaga sebut moratorium hotel di Bali diberlakukan awal Oktober 2024. *Kompas.com*. https://denpasar.kompas.com/read/2024/09/21/160746678/sandiaga-sebut-moratorium-hotel-di-bali-diberlakukan-awal-oktober-2024

[61] Bali Satu Data. (n.d.). Data pengelolaan sampah per kabupaten/kota di Provinsi Bali. Bali Satu Data Provinsi Bali. https://balisatudata.baliprov.go.id/laporan/data-pengelolaan-sampah-per-kabupatenkota-di-provinsi-bali?district_id=&sub_district_id=&year=2023&month=&date=

A study by Chong (2019) highlights that mass tourism in Bali has also led to significant socio-cultural challenges, including tourist misbehavior, cultural dilution, and congestion-driven migration. Tourist misbehaviors, often fuelled by alcohol and a lack of respect for local customs, disturb the island's deeply religious and culturally rich community. Cultural dilution occurs as local traditions and ceremonies are modified to cater to tourists, eroding the unique identity of Bali. Additionally, severe traffic congestion due to increased tourist vehicles has forced local residents to migrate away from popular tourist areas, disrupting community structures and further commercializing the island.

The crucial role of sustainable tourism strategies becomes evident considering the environmental and social challenges faced by destinations like Bali, where concentrated tourism threatens the ecological balance and quality of life. These strategies are essential not only for mitigating the immediate impacts of tourism but also for safeguarding the long-term viability and allure of such destinations. By implementing robust and sustainable tourism practices, Bali can address critical issues like water scarcity, waste management, and the degradation of marine ecosystems. More than just protective measures, these strategies ensure that tourism development is conducted equitably, benefiting all stakeholders, from local residents to international visitors.

2.3 Efforts to Address Concentrated Tourism: Super Priority Destinations

To reduce overcrowding in popular spots, the government has identified five "Super Priority Destinations" (*Destinasi Super Prioritas*, DSP) that it is prioritizing for development and promotion as part of its "New Bali" initiative. These destinations have been selected based on their potential to attract international tourists, drive economic growth, and enhance Indonesia's tourism sector.

One of the chosen destinations is Lake Toba in North Sumatra, the largest volcanic lake in the world, known for its stunning natural beauty and cultural experiences. Another is Borobudur Temple in Central Java, the country's most visited single tourist attraction and a UNESCO World Heritage site. Mandalika in West Nusa Tenggara is also on the list, a premium destination recognized for its beautiful beaches and as the host of the 2021 MotoGP world racing event. Labuan Bajo in East Nusa Tenggara serves as the gateway to Komodo National Park, home to the unique Komodo dragons. Finally, Likupang in North Sulawesi is highlighted as a marine tourism destination renowned for its beautiful beaches and underwater panoramas.

By developing these DSPs, the government aims to boost tourism revenue, create job opportunities, and stimulate local economies. Several key strategies have been outlined to achieve these goals.[62] First, there is a strong emphasis on infrastructure development, which includes enhancing transportation networks such as airports, roads, and ports to facilitate easier tourist access. Second, the government is also focused on improving the quality of telecommunication networks to ensure that visitors have reliable and high-speed internet access, enhancing their overall experience. Third, the promotion of creative economy products is a priority. This involves supporting local artisans and businesses to create unique,

[62] Ministry of Tourism and Creative Economy. (2021, April 29). Alasan Menparekraf fokus kembangkan 5 destinasi super prioritas. *The Ministry of Tourism and Creative Economy*. https://kemenparekraf.go.id/ragam-pariwisata/Alasan-Menparekraf-Fokus-Kembangkan-5-Destinasi-Super-Prioritas

high-quality products that reflect the rich cultural heritage of each destination, thereby offering tourists an authentic experience while driving economic growth. Lastly, the government is committed to preparing a skilled workforce by investing in education and training programs that equip local communities with the skills they need to thrive in the tourism sector.

According to the Minister of Tourism and Creative Economy, the planned developments for the five DSPs are expected to be finalized by the end of October 2024, coinciding with the end of President Joko Widodo's administration.[63] The next administration, particularly the appointed minister, will determine the direction of the program. However, the ministry has already established a framework for high-quality and sustainable tourism development.

In Presidential Regulation No. 88/2024, the government outlines a 20-year plan for developing Borobudur in five stages. The first phase (2024) focuses on integrating institutions, managing space use, raising cultural awareness, and improving transport and technology. The second phase (2025–2029) aims to accelerate tourism by enhancing human resources, diversifying attractions, and improving transport, including railway reactivation, to position Borobudur and Prambanan as world-class destinations. The third phase (2030–2034) will improve public services like electricity, water, waste management, and transport, while expanding tourism through MICE and special-interest offerings. The fourth phase (2035–2039) integrates Borobudur with the Joglosemar region, developing new attractions and strengthening transport links between Yogyakarta, Semarang, and Solo. Finally, the fifth phase (2040–2044) focuses on sustainable tourism by further diversifying attractions, improving skills, and enhancing transport to ensure long-term growth.

Similarly, Presidential Regulation No. 89/2024 outlines the 2024-2044 development plan for Lake Toba. Phase one (2024) focuses on revitalization by improving stakeholder commitment and environmental conditions and upgrading infrastructure and tourism services. Phase two (2025–2029) emphasizes sustainable tourism, standardization, and improved transportation as environmental conditions stabilize. In phase three (2030–2034), efforts shift to attracting new markets with diverse, high-quality products and promoting green practices. Phase four (2035–2039) aims to establish Lake Toba as a competitive destination through further product and market diversification. Finally, phase five (2040–2044) continues diversifying tourism products and integrating the tourism supply chain with other sectors for cohesive regional development.

The development of DSPs has made progress, but challenges remain. According to the 2025 State Budget Plan (*Rancangan Anggaran Pendapatan dan Belanja Negara*, RAPBN) and Work Plan Report *(Rencana Kerja dan Anggaran*, RKA),[64] several obstacles continue to hinder the advancement of these destinations. The lack of adequate infrastructure, for instance, has made it difficult to attract investors for key sites like Lake Toba, Borobudur, and Labuan Bajo. An interview with government officials revealed plans to address infrastructure issues in the DSPs through a pentahelix approach, which involves collaborations between the government, private sector, academia, communities, and media. The government has already established local authorities in each DSP to coordinate, synchronize, and facilitate planning, development, construction, and oversight within designated tourism zones.

[63] Pusparisa, Y. D. R. (2024, August 21). Destinasi prioritas: Proyek ambisius dengan ragam tantangan. *Kompas.id*. https://www.kompas.id/baca/ekonomi/2024/08/20/destinasi-prioritas-proyek-ambisius-dengan-ragam-tantangann

[64] Pusparisa, Y. D. R. (2024, August 21). Destinasi prioritas: Proyek ambisius dengan ragam tantangan. *Kompas.id*. https://www.kompas.id/baca/ekonomi/2024/08/20/destinasi-prioritas-proyek-ambisius-dengan-ragam-tantangan

While intended to oversee development, the local authorities established in these locations need the power to build essential infrastructure, such as clean water networks, electricity, wastewater treatment plants, and internal roads. This limitation has caused investors to reconsider investing in the designated tourism zones. Another major hurdle is the unresolved land disputes with local communities, which have stalled development within the tourism zones. Land acquisition must be completed with fair compensation for those whose property lies within these designated areas. Funding and inter-agency coordination issues have further slowed progress, particularly in regions like Likupang and Lake Toba, where challenges in area planning, accessibility, and environmental management persist. Despite these hurdles, government officials noted that the number of tourists and overall spending in DSPs has grown faster than in other tourist areas. This suggests that despite the challenges, the development efforts in these regions are starting to deliver tangible benefits, making the areas increasingly attractive to tourists and boosting local economies.

While the strategy to build "New Bali" destinations is commendable, it is equally important that the existing issues in Bali itself are addressed. Otherwise, there is a risk that Bali's long-term appeal could be diminished, potentially undermining the broader goals of Indonesia's tourism sector. Therefore, a balanced approach that encompasses both the enhancement of Bali's sustainability and infrastructure and the development of new destinations is essential for the success of the country's tourism strategy.

2.4 Efforts to Address Concentrated Tourism: Tourism Villages

In addition to developing five “New Bali” destinations, the government is trying to mitigate concentrated tourism through an existing program. In the early 2010s, the Ministry of Tourism and Creative Economy (MoTCE) introduced the Tourism Village program. This initiative was designed to ensure that tourism benefits are equitably distributed throughout the community. Gaining significant structure and momentum over the years, by 2024, the program boasted 6,027 tourism villages across the archipelago, including 168 in Bali alone. These tourism villages boost local economies, preserve natural and cultural heritage, and act as catalysts for other industries.

The primary advantage of tourism villages lies in their potential to decentralize tourism, offering appealing alternatives to traditional hotspots and alleviating the burden on overcrowded areas. Tourists are encouraged to explore lesser-known regions, reducing pressure on popular destinations and promoting a more equitable distribution of tourism benefits. This approach is especially impactful in rural areas, where economic opportunities are often limited, allowing the revenue generated from tourism to be reinvested in community infrastructure, education, and healthcare services.

An interview with government officials revealed that their strategy to develop the tourism villages emphasizes active engagement with local communities to maximize benefits and support capacity building. A central aspect of this effort is a six-phase awareness campaign designed to promote responsible tourism and enhance local character. A key initiative within this strategy is the Tourism Village Awards, which recognize and elevate the potential of these villages by focusing on essential areas such as human resources, institutional development, products, amenities, accessibility, and resilience. This balanced approach addresses the three

Ps: planet, people, and profit. Additionally, the government has introduced programs like "*Senandung Dewi*," aligning tourism villages with sustainability values. A network of tourism villages serves as a valuable reference for stakeholders seeking information and data on sustainable tourism practices.

The interview highlighted several benefits of the tourism villages program, including the promotion of decentralization to reduce dependency on major tourist areas. The program also encourages behavioral changes that enhance visitor experiences and empower local economies by tapping into local tourism potential, ensuring that income generated from tourism directly benefits communities. Furthermore, the program emphasizes the preservation of culture and the environment through effective waste management, nature conservation, and the use of eco-friendly energy.

In Bali, Astawa et al. (2019) analyzed six tourism villages, highlighting their economic and social impacts. Economically, tourism has stimulated local growth by creating jobs and increasing village revenue. However, the anticipated rise in household income and investment opportunities has yet to materialize fully. Socially, while infrastructure improvements and an improved village image are notable successes, issues like living standards and poverty reduction have yet to see significant progress. Despite the influx of tourists, there has been no increase in crime or social unrest, reflecting successful cultural adaptation and maintained village harmony. The authors recommend more focused planning and community-driven approaches to maximize benefits and mitigate negative impacts, stressing the need for sustainable and community-aligned tourism development for long-term success. To date, no comprehensive study has directly assessed whether establishing tourism villages has successfully alleviated the pressure on Bali's traditional tourist hotspots.

The officials also explained that the government classifies tourism villages into four stages: beginner, developing, advanced, and independent. As of September 2024, over 50% of these villages are still in the beginner stage. To ensure residents are aware of their community's tourism designation, conducting a self-assessment upon official designation by the local governor or regent is beneficial. This assessment helps residents understand their status and identify specific needs based on their classification.

Three critical issues emerge in the development of tourism villages. First, there is an urgent need to strengthen human resources and institutional frameworks within these communities. The key institutions involved include local government, village-owned enterprises (*Badan Usaha Milik Desa*, BUMDES), youth organizations (*karang taruna*), and community empowerment groups (*Pemberdayaan Kesejahteraan Keluarga*, PKK). Harmonizing these entities is crucial for effectively supporting tourism initiatives. Second, many villages face challenges in identifying their unique characteristics that could attract tourists. This often results in the replication of established tourism models, which diminishes their individuality and appeal. Third, not all residents engaged in tourism possess adequate knowledge of the sector. Informal workers, in particular, require substantial training in tourism principles. For example, villages with mountain climbing attractions must have certified guides to ensure safe and professional experiences for visitors. These three challenges highlight the importance of village leaders developing a comprehensive understanding of tourism and aligning their programs with BUMDES objectives. Local regulations should promote tourism while honoring traditional customs.

Moreover, the interview with government officials indicated that the current target demographic for tourists includes millennials and Generation Z, with a notable targeted increase of 30% in their engagement. Two key initiatives are in place. First, *Kampanye Sadar Wisata* (KSW), a program aimed at developing tourism villages through activities such as Focus Group Discussions (FGDs), training, mentoring, partnerships, and impact measurement. Of the 155 tourism villages participating in KSW, 65 have already demonstrated positive results. Second, *Anugerah Desa Wisata* Indonesia (ADWI) is an award-giving event that recognizes excellence in tourism villages, with a target of recognizing 225 villages.

To further diversify tourism destinations, the ministry has initiated the 3B program to encourage visitors to explore northern Bali, shifting focus from the heavily concentrated southern Bali.[65] The Marketing Deputy of the MoTCE has formulated a collaborative tour package that includes Banyuwangi, Buleleng, and West Bali. Tourists visiting Buleleng are encouraged to continue their journey to West Bali, specifically Jembrana. To support this initiative, the MoTCE is prepared to collaborate with other ministries and agencies to enhance road accessibility.

Despite these efforts, several challenges persist. One significant issue is the uneven infrastructure across the island, which affects accessibility to various tourist locations (Suthayana, 2023). Although Denpasar benefits from well-developed transport infrastructure, regencies such as Buleleng, Tabanan, Jembrana, and Karangasem face significant accessibility challenges. These areas suffer from long travel distances, poor road conditions, and limited transportation options, leading to uneven economic development within the province. Addressing these issues through infrastructure improvements, such as road widening, toll road construction, and railway development, is crucial for enhancing accessibility and fostering equitable economic growth throughout Bali.

Another challenge is marketing and demand, particularly in promoting tourism beyond southern Bali. A noteworthy promotional tool is how platforms like Airbnb have introduced features such as 'I'm Flexible' and 'Categories' to encourage the exploration of less-traveled areas. By showcasing unique products and experiences in these lesser-known regions, these platforms can effectively redirect tourist traffic from overcrowded destinations. This strategic marketing approach not only helps to distribute visitor numbers more evenly but also creates economic opportunities in underserved areas, contributing to a more balanced and sustainable tourism landscape across Bali.

In addition to infrastructure challenges, human resource development poses an issue in Bali. Among the 2,617,816 individuals in the workforce in 2023, 32.06% only have primary school education, and 11.92% have only completed junior high school. This educational background indicates that a substantial portion of the labor force has limited skills and qualifications, which can impact the overall quality and productivity of human resources in the region. The tourism sector requires a skilled workforce to meet the demands of both domestic and international tourists. A workforce with limited qualifications may need assistance or interventions to provide the high level of service expected in hospitality, tour guiding, culinary arts, and management roles. As a result, the supply of labor may not align with the industry's needs, potentially

[65] CNN Indonesia. (2024, August 12). Jurus Kemenparekraf cegah Bali alami overtourism: Program 3B. CNN Indonesia. https://www.cnnindonesia.com/gaya-hidup/20240812225556-269-1132233/jurus-kemenparekraf-cegah-bali-alami-overtourism-program-3b

hindering the sector's growth and its ability to deliver exceptional visitor experiences. This misalignment can impede the tourism industry's ability to expand and compete effectively on a global scale.

Empowering Indonesia's Next Generation of Tourism Entrepreneurs

By the foot of the majestic Mt Agung in eastern Bali, amid the lush rice fields of the quiet village of Sideman, foreign tourists are increasingly drawn to the authentic local experience offered by a charming cottage owned by entrepreneur Wira.

Natural View Sidemen Cottage has been a part of the village for a number of years, but it wasn't until Wira joined the Airbnb Entrepreneurship Academy in 2023 that he learned how to effectively reach a global audience.

"It has not only impacted my life by equipping me with the skills to thrive in the hospitality industry, but it also created jobs in our local community," Wira says, reflecting on the academy's impact.

Wira's story demonstrates the impact of the academy, which was launched as part of Airbnb's commitment to fostering quality tourism in Indonesia. In partnership with the Ministry of Tourism and Creative Economy, Airbnb introduced this program last year to support the economic recovery of Indonesia's tourism sector, which was still reeling from the pandemic.

Wira, along with 196 other homestay entrepreneurs from 27 tourism villages across Bali, Borobudur, and Lombok, received training on a range of essential topics, from the fundamentals of tourism entrepreneurship to the intricacies of digital content and social media marketing. Led by top-rated and experienced Airbnb hosts, the sessions were designed to provide not just skills, but instill confidence among the participants, many of whom have no background in the hospitality industry.

Beyond business skills, the academy also fostered community connections and empowered local entrepreneurs to tell their stories on a global platform.

This was particularly important for Haidar Imama, as his Niagara Homestay in Magelang, Central Java, has several competitors for tourists wanting to see the largest Buddhist temple in the world, the world-famous Borobudur Temple. Reaching international markets, he says, is essential for his small business.

The same is true for Habiburrohmah, who manages the Solha Homestay in Lombok. At the Academy, he says he learned how to use different marketing strategies, including relying on digital platforms like Airbnb, to attract a broader customer base.

The success of the 2023 pilot has laid a solid foundation for the Academy's continued expansion, with plans to tailor the program further to meet the unique needs of participants from diverse regions across Indonesia. By enhancing post-training support and developing a hosting toolkit, Airbnb aims to sustain the momentum and ensure long-term success for these local entrepreneurs.

This comes at an opportune time amid the global resurgence of travel, particularly with the growing trend of travelers seeking out less crowded, off-the-beaten-path destinations rather than traditional tourist experiences.

"The Airbnb Entrepreneurship Academy is a vital initiative that empowers communities by introducing them to hosting on our platform," says Amanpreet Bajaj, the General Manager for Airbnb Southeast Asia, India, Hong Kong and Taiwan.

"Through our partnership with the Minister of Tourism and Creative Economy, we're committed to extending this opportunity to even more communities in Indonesia and enabling the locals to benefit from tourism in the places they call home."

2.5 Established Policies and Regulations for Sustainable Tourism Development

The National Development Plan 2005–2025 and Law No. 10/2009 on Tourism set the foundation for integrating sustainability into Indonesia's tourism sector. The National Development Plan emphasizes using tourism to boost economic activities, enhance local welfare, and create job opportunities while managing natural and cultural resources sustainably. The 2009 Tourism Law supports these goals by evaluating tourism development in terms of economic growth and improvements in welfare, poverty reduction, environmental conservation, and cultural development. Despite these commitments, specific regulations for sustainable tourism remain underdeveloped within these frameworks. As of early July 2024, the Indonesian House of Representatives Commission X, which oversees tourism, was forming a working group to review and revise the 2009 Tourism Law.[66] The working group will examine tourism attractions based on the 3A principles—accessibility, amenities, and attractions—and seek inputs from academics and tourism stakeholders to establish standards for tourism destination areas. They also plan to remove certain articles and align the law with recent legislation, emphasizing the importance of community participation and refining definitions related to tourism and cultural activities.[67]

The Strategic Plan on Sustainable Tourism and Green Jobs 2012[68] introduces concrete strategies for implementing sustainable tourism practices. It focuses on changing stakeholder mindsets, developing sustainable tourism indicators, and promoting green jobs. Key strategies include mainstreaming green jobs, applying voluntary sustainability standards, and incorporating sustainable planning into tourism development. Complementing these efforts, the ministry's Regulation No. 9/2021 provides detailed guidelines for sustainable tourism destinations, emphasizing sustainable management, cultural and socio-economic sustainability, and environmental protection. The "*Kita Mulai Sekarang*" (We Start Now) movement also encourages environmental awareness and responsible tourism practices to address implementation challenges and enhance the sector's sustainability.

[66] Savitri, P. (2024, July 1). DPR: RUU Kepariwisataan harus bedakan desa wisata dan wisata pedesaan. Antara News. https://www.antaranews.com/berita/4176786/dpr-ruu-kepariwisataan-harus-bedakan-desa-wisata-dan-wisata-pedesaan
[67] Thea, A. (2024, July 8). RUU Kepariwisataan bakal diboyong ke paripurna jadi usul inisiatif DPR. Hukum Online. https://www.hukumonline.com/berita/a/ruu-kepariwisataan-bakal-diboyong-ke-paripurna-jadi-usul-inisiatif-dpr-lt668ba425ccaee/
[68] The Strategic Plan on Sustainable Tourism and Green Jobs 2012 was initiated by the International Labour Organization (ILO), together with the MoTCE and the Ministry of Manpower under ILO's Green Jobs in Asia Project in Indonesia.

Our interview with government officials revealed several strategies employed by the government to address the challenges posed by concentrated tourism destinations. One initiative is the Indonesia Sustainable Tourism Award (ISTA), a certification program recognizing sustainable tourism practices. As of September 2024, 36 villages have achieved this certification, demonstrating their commitment to sustainability. In collaboration with Bank Indonesia, the government is also actively working to enhance tourism management nationwide. The MoTCE has also launched campaigns to promote sustainable tourism, extending these efforts beyond Bali. In Bali, the provincial government plays a vital role in this initiative, engaging in socialization and implementing activities that support sustainable practices. These include the use of a carbon footprint calculator and the certification of villages and safety protocols. Additionally, a significant focus is placed on waste management awareness in Bali. This campaign involves partnerships with various organizations, aiming to improve waste management practices and foster environmental responsibility. Through these comprehensive efforts, the government aims to shift tourism from the southern regions of Bali to the north, fostering a more balanced and sustainable tourism landscape across the island.

3. Best Practice from Other Countries

3.1 Comparison with International Sustainable Tourism Standards and Certifications

The Global Sustainable Tourism Council (GSTC) Criteria offer a globally recognized framework that helps stakeholders—including businesses and government agencies—integrate sustainability into their operations and policies. The GSTC Criteria align with international best practices in sustainability, such as ISO standards, and are supported by organizations, such as the ISEAL Alliance. While ISO standards, such as ISO 14001 for environmental management and ISO 26000 for social responsibility, focus broadly on quality, environmental, and social responsibility practices across industries, the GSTC Criteria are specifically designed for the tourism sector. Both frameworks promote effective sustainability planning, maximizing social and economic benefits for local communities, preserving cultural heritage, and minimizing environmental impacts, making them complementary in practice.

The GSTC Criteria serve as the basis for global standards for sustainability in travel and tourism. They are used for education and awareness-raising, policymaking for businesses and government agencies and other organization types, measurement and evaluation, and as basis for certification.

The GSTC standard harmonizes closely with the principles of sustainable tourism as advocated in Indonesian legislation. This alignment underscores Indonesia's commitment to integrating sustainable practices into its tourism industry, ensuring that development initiatives prioritize environmental conservation, socio-economic benefits for local communities, and the preservation of cultural heritage.

In 2016, GSTC announced that the Sustainable Tourism Destination Standard for Indonesia achieved 'GSTC-Recognized' status. This status confirms Indonesia's dedication to promoting sustainable tourism products and services. When a standard is GSTC-Recognized, it means that technical experts and the GSTC Accreditation Panel have reviewed it and deemed it equivalent to the GSTC Criteria.

3.2 Lessons Learned from Successful Strategies Implemented Globally

Japan's Strategy for Sustainable Tourism

Japan's tourism strategy has established the country as a global tourism hub, drawing millions of visitors annually to its cultural and natural landmarks. Major centers like Tokyo, Osaka, and Kyoto have experienced increased tourist visits, leading to concerns about overcrowding and its impact on local communities. In response, the Sustainable Tourism Promotion Headquarters released a policy in 2018 aimed at achieving sustainable tourism development. This policy emphasized tourism destination management, collaboration with local stakeholders, and effective communication with both residents and visitors. However, the COVID-19 pandemic disrupted the tourism industry, forcing authorities to shift focus from long-term strategies to crisis management and recovery efforts.

Silanteva (2024) wrote that as tourism rebounded post-pandemic, Japan introduced new initiatives to address the challenges of overtourism. The country's "Comprehensive Measures for the Prevention and Mitigation of Overtourism" aims to reduce congestion, promote regional tourism, and improve visitor behavior through better communication and engagement with local communities. These measures include diverting tourists from buses to railways, particularly in Kyoto, and supporting cashless transactions across multiple regions. While these strategies demonstrate innovation, challenges such as infrastructure limitations in Kyoto and the need for broader application of new technologies remain.

The success of Japan's efforts to create sustainable tourism will depend on balancing economic benefits with the well-being of local communities. Promoting regional tourism and creating unique experiences in lesser-known areas could alleviate pressure on crowded hubs and distribute tourism revenue more evenly. However, failure to manage the sudden influx of tourists could overwhelm local infrastructure and strain community resources. Involving local residents in policy discussions and adapting strategies to address emerging issues will ensure that Japan's tourism policies drive economic growth and foster long-term sustainability and community harmony.

The Tiaki Promise in New Zealand

Effective collaboration between government bodies and various stakeholders, including the private sector, is crucial in pursuing sustainable tourism. A notable example of successful collaboration is the Tiaki Promise, a collective initiative to promote responsible tourism in New Zealand. This initiative unites the efforts of government agencies, private tourism companies, and indigenous communities to cultivate a responsible tourism culture that benefits both the environment and local populations. Developed in response to the challenges of increasing tourist numbers and their impacts, the Tiaki Promise, which translates from Māori as "to care for people and place," is a testament to the strong synergy between governmental bodies and private entities like Tourism New Zealand, Air New Zealand, and the Department of Conservation, which are all working together to uphold sustainable tourism practices.

The framework of the Tiaki Promise provides tourists with clear guidelines on responsible behavior, covering everything from environmental respect to road safety and cultural

sensitivity. Promoted through various channels like visitor brochures, videos, and digital campaigns, the initiative ensures that its message reaches tourists at multiple touchpoints, from planning their trip to their actual stay in New Zealand. For instance, Air New Zealand integrates Tiaki messages into its in-flight videos and onboard magazines, effectively educating passengers upon entry. Similarly, Airbnb's partnership with the Tiaki Promise aligns with the trend of "conscious travel," encouraging guests to act as guardians of New Zealand's unique environment and culture. Through this collaboration, Airbnb promotes sustainable practices among its hosts and guests, significantly enhancing the travel experience and preserving New Zealand's natural and cultural heritage.

Airbnb was praised for using its extensive reach to disseminate the Tiaki message, underlining the impact of educational efforts, including minimizing environmental impact and respecting local customs. These initiatives reflect a broader commitment to fostering travel behaviors that benefit visitors and their destinations. The success of the Tiaki Promise is reflected in the positive behavioral changes among tourists and the widespread adoption of sustainable practices within the tourism sector, inspiring other nations to consider similar collaborative approaches to combat overtourism and enhance sustainability. Ultimately, the Tiaki Promise is a compelling model of how unified efforts can protect and sustain tourism ecosystems for future generations.

Using Technology to Disperse Tourism: Airbnb Case

Airbnb's global platform has transformed the tourism landscape by offering travelers alternatives to traditional accommodations, facilitating cultural exchanges, and spreading tourism to new destinations. In 2023, Airbnb guests traveled to more than 100,000 cities and towns around the world, making it the most dispersed year of travel ever on the platform.[69]

Innovative product features introduced by Airbnb, such as the 'I'm Flexible' and 'Categories' search tools, help to further drive tourism dispersal. These tools are designed to encourage travelers to explore lesser-known destinations and unique accommodations, diverting attention from overcrowded urban hubs and promoting more sustainable travel choices.

By connecting tourists with hosts in less-frequented areas, Airbnb disperses the benefits of tourism to more communities. As a digital platform, it removes the barriers to entry to tourism entrepreneurship. This allows underrepresented communities to gain equal access to global tourism revenue. Everyday people can share their homes, without start-up fees or overhead costs, and hosts keep the vast majority of what they charge for their listing, with most paying a 3% service fee per booking.[70]

Research from Oxford Economics found Airbnb activities supported more than 93,000 jobs in Indonesia in 2021 and contributed approximately USD 975 million (IDR 14.4 trillion)[71] to Gross Domestic Product. The report also highlighted the powerful multiplier effect Airbnb guest

[69] Airbnb. (2024, February 22). Last year, Airbnb guests traveled to more cities than ever before. *Airbnb Newsroom*. https://news.airbnb.com/last-year-airbnb-guests-traveled-to-more-cities-than-ever-before/
[70] Airbnb. (2020, November 16; updated 2024, September 19). How much does Airbnb charge hosts? Airbnb Resource Centre. https://airbnb.com.sg/resources/hosting-homes/a/how-much-does-airbnb-charge-hosts-2888
[71] Prevailing exchange rates at the time of study were applied, using proprietary data from Oxford Economics.

spending has within local communities. In 2022,[72] Airbnb guests spent a total of USD 1.1 billion (IDR 15.7 trillion) in Indonesia in areas such as transportation, restaurants, and retail stores, as well as arts and entertainment.[73]

Another critical tool in Airbnb's strategy is the City Portal, a platform specifically designed for local governments to better manage tourism within their communities. Launched in 2020, the City Portal provides municipalities with data insights to better understand Airbnb activity in their areas. This helps cities make informed decisions about tourism management, ensuring that they can balance the economic benefits of tourism with community well-being.

In addition to these technological innovations, Airbnb has rolled out numerous initiatives aimed at harmonizing tourism growth with the well-being of local communities. For instance, the company collaborates with local governments and organizations to foster responsible tourism. This includes educating hosts and guests on environmental conservation, promoting local experiences that support small businesses, and encouraging sustainable travel habits. Airbnb's recent campaign, With Love, Bali, encourages travelers to respect local culture, travel responsibly, support local businesses, and travel further afield on the island. The content was made in consultation with local hosts, community, and government, and Airbnb is partnering with influencers from key inbound markets such as Australia and India to promote this message of responsible travel in Bali.[74]

4. Recommendations

The Indonesian government can adopt a multifaceted strategy to enhance sustainable tourism in Indonesia.

1. First and foremost, there is an urgent need for robust infrastructure development. Enhanced transportation, utilities, and digital connectivity not only make tourism villages more accessible but also significantly improve visitor experience, which is crucial for attracting more tourists. Equitable infrastructure development across Bali and other tourism destinations is essential to ensure that the benefits of tourism are distributed evenly and that no area is left underserved. This approach helps to avoid overburdening popular destinations while supporting the growth of emerging areas. This perspective is bolstered by a 2017 UNWTO report that emphasizes the critical role of infrastructure in facilitating accessible and sustainable tourism.
2. Additionally, equipping the local populace with the necessary skills through comprehensive training programs in hospitality, business management, and eco-tourism is essential. Such training not only enhances the quality of services provided but also empowers local communities by building their capacity to manage and benefit from tourism activities effectively. By fostering expertise in these areas, local residents can contribute to the development of sustainable tourism practices, which are crucial for minimizing environmental impact and ensuring long-term viability. This approach

[72] This refers to the 12-month period up to and including March 2023, which represents the first full year after the reopening of international travel.
[73] Airbnb. (2023, November 7). Report: Airbnb's contribution to the Indonesian economy post pandemic. Airbnb Newsroom. https://news.airbnb.com/report-airbnbs-contribution-to-the-indonesian-economy-post-pandemic/h
[74] Airbnb. (n.d.). With love, Bali. Airbnb. https://www.airbnb.com.sg/e/ppid_withlovebalii

also helps to elevate the economic standing of local communities, creating job opportunities and supporting local businesses. Various global reports have underscored this strategy as a cornerstone of sustainable tourism development, highlighting that investing in human capital is critical for achieving both economic growth and environmental stewardship in the tourism sector.

Public-private partnerships (PPPs) can significantly enhance these training initiatives by providing the resources, expertise, and infrastructure needed for their successful implementation. Private companies, particularly those with a vested interest in tourism, can collaborate with local governments and educational institutions to develop tailored training programs that address the specific needs of the community. These partnerships can also facilitate internships and job placements, giving local residents hands-on experience in the industry. By sharing knowledge and resources, PPPs can help bridge the gap between global best practices and local realities, ensuring that the skills and knowledge gained through training programs are directly applicable and beneficial to the community. This collaborative approach not only strengthens the local workforce but also fosters a more resilient and sustainable tourism industry that benefits all stakeholders involved.

3. Efforts must also be made to foster tourism that respects and preserves local culture and the environment. Supporting cultural festivals and environmentally friendly practices is vital for maintaining the cultural heritage and ecological balance that often serve as the main attractions for tourist villages.

   Cultural festivals provide a platform for showcasing local traditions, arts, and crafts, offering tourists an authentic experience while simultaneously preserving and celebrating local heritage. These events not only attract visitors but also engage the local community, creating opportunities for cultural exchange and mutual understanding. By investing in and promoting such festivals, the tourism industry can contribute to the preservation of traditional practices and support local artisans and performers.

   Educating tourists about responsible travel practices is another component of sustainable tourism development. The government, in collaboration with local communities and tourism operators, can implement guest education programs that inform visitors about local customs, environmental conservation, and respectful behavior towards cultural sites. By raising awareness among tourists about the importance of minimizing their environmental footprint and respecting local traditions, these programs can help preserve the integrity of tourist destinations. Initiatives such as distributing informational materials, conducting orientation sessions upon arrival, and promoting eco-friendly behaviors through digital platforms can make a significant impact. Educated guests are more likely to engage in sustainable practices during their stay, such as reducing waste, supporting local businesses, and participating in conservation efforts, thereby contributing to the long-term sustainability of tourism in Indonesia.

4. Enhanced collaborations between the government, local communities, and the private sector can lead to more integrated and sustainable tourism development. Such

partnerships ensure that all stakeholders can contribute to and benefit from the growth of tourism. Digital platforms like Airbnb can play a pivotal role in this collaborative effort by partnering with government initiatives to help disperse tourism away from traditional hotspots and into lesser-known areas.

5. These platforms offer a unique opportunity to connect travelers with accommodation options in diverse and emerging destinations, thus encouraging tourists to explore new regions. By leveraging data and insights from these platforms, governments can identify potential tourism growth areas and develop targeted infrastructure and promotional strategies. Additionally, Airbnb and similar platforms can collaborate with local communities to provide training and support, ensuring that new hosts are well-prepared to offer high-quality, sustainable experiences.
6. Such digital platforms can also help address issues of concentrated tourism by distributing visitor traffic more evenly, reducing the pressure on popular destinations, and promoting a more balanced development across various regions. This approach not only benefits tourists by offering a wider range of experiences but also supports local economies and promotes sustainable tourism practices. For example, hosts can open their homes to travellers, utilizing existing structures and bringing tourism revenue into their community. By integrating digital solutions with traditional tourism management, stakeholders can work together to create a more equitable and resilient tourism ecosystem.

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