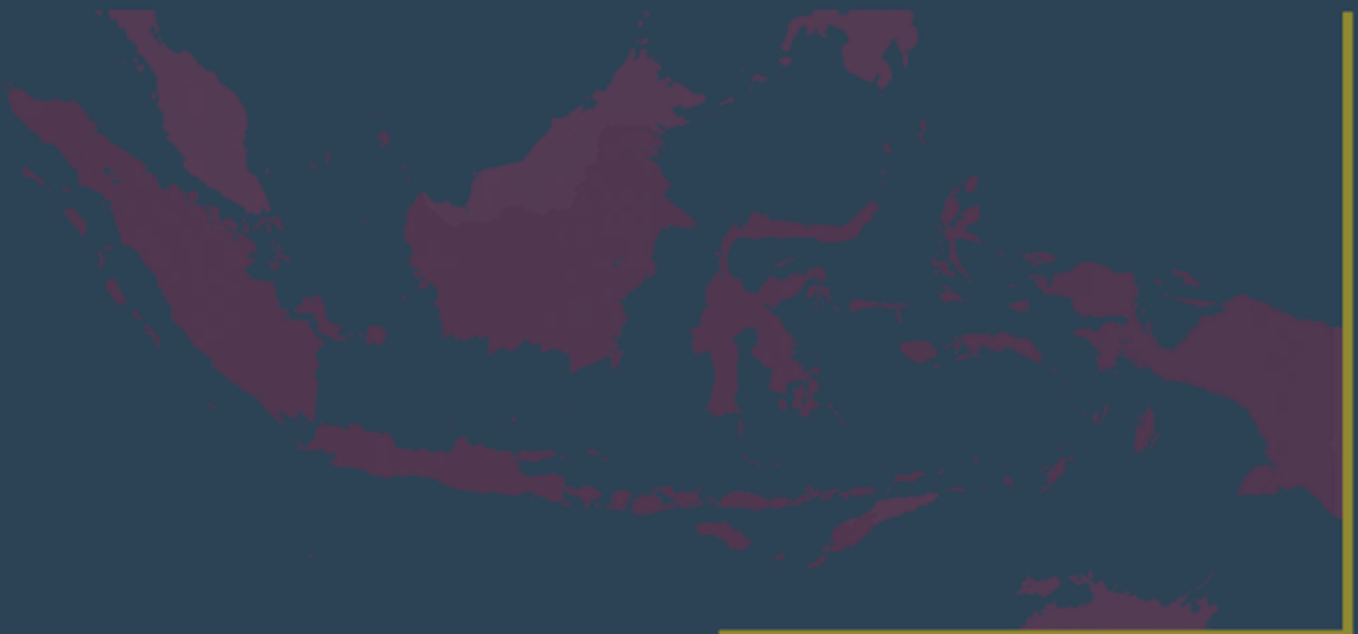


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II.

**Transforming Foreign Policy, Economic Growth,
and Business Innovation**

MCC Center for International Economy



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Transforming Foreign Policy, Economic Growth and Business Innovation

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Foreword

Indonesia, with its rich cultural heritage, diverse population, and vast economic potential, stands at a pivotal moment in its history. As the world's fourth most populous country and largest economy in Southeast Asia, Indonesia's trajectory in shaping its foreign policy, driving economic growth, and fostering innovation in business will have far-reaching implications not only for the nation itself but for the region and beyond.

Indonesia stands at a critical juncture in its journey towards economic prosperity, global engagement, and sustainable development. With a burgeoning young population, abundant natural resources, and strategic geographical position, Indonesia has the potential to emerge as a key player on the world stage. The volume seeks to shed light on the transformative pathways that can propel Indonesia towards achieving its full potential in foreign policy, economic growth, and business innovation.

Within the pages of this volume, you will find scholarly analyses, practical insights, and thought-provoking recommendations that aim to inform the readers, policymakers, business practitioners, and academics alike. From exploring the dynamics of Indonesia's foreign relations to unlocking the drivers of economic growth and fostering a culture of innovation in business, the contributions in this volume offer a comprehensive and multidimensional perspective on Indonesia's evolving landscape.

This book complements the International Conference Indonesia Rising: Transforming Foreign Policy, Economy Growth, and Business Innovation, organized by the Matthias Corvinus Collegium (MCC) Center for International Economy, which was held on September 16th, 2024.

However, the examination of relations between Indonesia and Hungary in the pages of this publication provides a comprehensive overview of the historical context, current cooperation's and future prospects that characterize the bilateral partnership from political dialog and economic cooperation to cultural exchange and people-to-people relations.

Water diplomacy cooperation between Indonesia and Hungary: improving water management infrastructure in the Jakarta metropolitan region

Balázs Várnai

1. Abstract

This paper explores the potential for water diplomacy cooperation between Indonesia and Hungary with a focus on enhancing water management infrastructure in the Jakarta metropolitan region. It begins by highlighting the evolving relationship between the two countries and the increasing collaboration in various development projects. The importance of water diplomacy in the 21st century is then emphasized, addressing the challenges of water security, equitable distribution of freshwater resources, and the impending global freshwater supply-demand gap. The paper delves into Hungary's expertise in water management and Indonesia's growing water scarcity issues, laying the groundwork for potential collaboration. Insights gained from direct engagement with government officials, experts, and on-site observations in Jakarta and Yogyakarta inform the proposed cooperation. The significance of addressing water-related challenges in the context of overpopulation and climate change is underscored. This paper aims to provide a foundation for expanding water management cooperation between Indonesia and Hungary, particularly in the Jakarta metropolitan region, and offers a comprehensive framework for future collaborative endeavors.

2. Introduction

The political relationship between Indonesia and Hungary dates back to a long time. The two countries established diplomatic relations in 1955 and two years later Hungary opened its diplomatic mission in Jakarta. Although the relationship between the two countries has been limited by geographical distance and differing foreign policy ambitions, cooperation between Budapest and Jakarta has improved significantly since the Hungarian government's 'Open to the East' policy in 2012. There have been several ministerial-level meetings between the two countries in recent years, and Hungarian Prime Minister Viktor Orbán has visited the Asian country twice¹.

Currently there are 11 ongoing Hungarian development projects in Indonesia worth USD 5 million⁰. In the field of development projects, the two main areas of cooperation are technology transfer and various educational programmes. Perhaps the most significant of these is the Hungarian company that has won a tender to develop a toll payment system for

¹ Cabinet Office of the Prime Minister, (2016). *Prime Minister Viktor Orbán to pay official visit to Indonesia*. <https://2015-2022.miniszterelnok.hu/prime-minister-viktor-orban-to-pay-official-visit-to-indonesia/>

⁰ Nemzeti Fejlesztési Együttműködés, (2020). International Development Cooperation Mapping Tool. https://idcmap.mfa.gov.hu/bilateral_projects/738

Indonesian highways⁰. The Hungarian-Indonesian Joint Committee for Economic Cooperation was established to strengthen economic relations between the two countries. Trade flow between the two countries amounted to USD 184 million in 2021, an increasing trend compared to previous years⁰.

I had the chance to visit the Ministry of Foreign Affairs of Indonesia in Jakarta, where we had an overview of Indonesian-Hungarian relations. Hungary is the No. 5. partner of Indonesia in terms of imports in the CEE region, and the No. 2. partner with regards to investing. For Hungary, Indonesia is the 5. largest commercial partner in the ASEAN region. However, trade relations between the EU and Indonesia have generally improved, as Jakarta considers the EU and the US more reliable partners than China.

Hungarian-Indonesian economic relations are reported to have extended to renewable energy, but water cooperation is still the main area of cooperation highlighted by most interviewees. Hungary is a country with great expertise in the water and sanitation industry, while in Indonesia water scarcity is a growing issue. Currently 5 of the 11 ongoing Hungarian projects in Indonesia are related to water management, with a value of USD3.3 million⁰. In my paper, I try to expand on this already existing cooperation to other issues regarding water management in Indonesia, mainly in the Jakarta metropolitan region.

As part of the research project, I had the opportunity to spend one week in Jakarta and Yogyakarta. During my stay, I was able to showcase my idea in front of government officials, experts, university students and individuals, who gave useful insights in the Indonesian water industry, the possible advantages and challenges of such a project. Moreover, I also had a personal insight on the shortcomings of water purification in Indonesia, in particular Jakarta Metropolitan Region. In this paper, I will mix the initial research idea with the on-site experiences.

3. The importance of water diplomacy in the 21st century

As overpopulation and climate change become an ever-concerning problem in modern society, the issue of water security is also becoming a major issue in international diplomacy. There are three main problems regarding the distribution of freshwater: if it is too much, too little, or too polluted⁰. In the first case, too much water can cause massive floods, which threaten the infrastructure, the nearby cities, and people's lives. Too little and too polluted freshwater means shortages of food and drinking water and slower economic development, leading to poverty and famine. The inequitable distribution of freshwater resources is also a source of conflict between neighboring states. Upstream countries, such as Ethiopia on the river Nile or China on the river Mekong can control the flow of water by building dams, which makes downstream countries like Egypt or Vietnam highly dependent on their upstream neighbors⁰.

⁰ Magyarország jakartai nagykövetsége, (2023). Gazdasági kapcsolatok - Indonézia. <https://jakarta.mfa.gov.hu/page/gazdasagi-kapcsolatok-indonezia>

⁰ Magyarország Kormánya, (2022). Megtartotta hatodik ülését a Magyar-Indonéz Gazdasági Együttműködési Vegyes Bizottság. <https://kormany.hu/hirek/megtartotta-hatodik-uleset-a-magyar-indonez-gazdasagi-egyuttmukodesi-vegyes-bizottsag>

⁰ Nemzeti Fejlesztési Együttműködés, (2020). International Development Cooperation Mapping Tool. https://idemap.mfa.gov.hu/bilateral_projects/738

⁰ Tóth, J. I., (2012). 136 Külügyi Szemle Magyarország a vízdiplomáciai erőfeszítések középpontjában. Külügyi szemle, 11(4), 136-149.

Based on current water use trends, global freshwater demand will exceed the available freshwater supply globally by 40% by 2030⁰. Currently, 2 billion people live in areas lacking drinking water and around 3,6 billion people (almost half the world's population) lack basic sanitation⁰. This means that freshwater scarcity is already a major threat to global society.

To address this threat, governments are also working on a regional and global level to mitigate the water crisis. Regional cooperation usually means transboundary cooperation between countries sharing river basins. On one hand, these cooperations aim to prevent potential conflicts between upstream and downstream countries, instead, emphasizing diplomatic solutions⁰. On the other hand, they can make water management more effective, by aligning individual goals and sharing information.

In addition to regional cooperation, there is also a global framework for water diplomacy. The United Nations is addressing this issue in many ways. The UN's main development framework, the Sustainable Development Goals (SDGs) includes a goal dedicated to water security⁰. Among other things, SDG6 aims to achieve universal access to drinking water, universal access to adequate sanitation, improve water quality, increase water use efficiency, and implement integrated water resource management (IWRM) at all levels⁰. The annual Global Water Summit is also an important platform in global water diplomacy, where the participants can showcase the latest water management technologies and build a global network of experts, businesses, government leaders and investors, who can work together to ensure water safety around the world.

4. Hungary's water diplomacy approach

In recent decades, Hungary has become an important actor in the field of water diplomacy. Due to geographical reasons, Hungarian tradition of water management goes back to a long time and over the centuries, the Hungarian water sector has acquired a great deal of expertise in this field. As the country is located in the Carpathian Basin, about 96% of Hungary's freshwater comes from outside its borders⁰. As the whole country is located in the Danube River basin, in a valley, the area has always been prone to flooding. Furthermore, as a downstream country, Hungary is dependent on the neighboring countries' water management actions. This has led to many conflicts between Hungary and its neighbors, such as the construction of the Gabčíkovo–Nagymaros dams by Slovakia, or the Baia Mare cyanide spill in Romania, both of which severely affected the Hungarian environment.

In order to reduce exposure from its neighbors, Hungary is actively trying to initiate and shape regional water cooperation. During the Hungarian presidency in the Council of the

⁰ World Economic Forum, (2022). Ensuring sustainable water management for all by 2030. <https://www.weforum.org/impact/sustainable-water-management/>

⁰ 2030 Water Resources Group, (2022). 2030 WRG annual report 2022 , WRG.

⁰ Lasetzky, K., (2020). A discourse and practice analysis of Hungary's water diplomacy approach. Noragric Department of International Environment and Development Studies.

⁰ Molnár, K., Cuppari, R., Schmeier, S. & Demuth, S., (2017). Preventing Conflicts, Fostering Cooperation – The many Roles of Water Diplomacy, Stockholm: UNESCO's International Centre for Water Cooperation.

⁰ UNDP, (2023). Goal 6: clean water and sanitation. [https://www.undp.org/sustainable-development-goals/clean-water-and-sanitation?](https://www.undp.org/sustainable-development-goals/clean-water-and-sanitation?gclid=Cj0KCQjw0vWnBhC6ARIsAJpJM6djs_xNjN_iZwSaRcWN9dbhO1az8pjzMFv1vpOcDVxlOcVLaDI8P-IaAo1MEALw_wcB)
gclid=Cj0KCQjw0vWnBhC6ARIsAJpJM6djs_xNjN_iZwSaRcWN9dbhO1az8pjzMFv1vpOcDVxlOcVLaDI8P-IaAo1MEALw_wcB

⁰ Hungarian Investment and Trade Agency, (2013). The Hungarian Water and Sanitation Industry in the 21st century. Budapest, HITÁ.

European Union, the EU created its own Danube Regional Strategy⁰. This included targets aiming for socio-economic development, water security, modernization of transport corridors and increasing the efficiency of water management. This strategy is complemented by bilateral agreements with neighboring countries which set out further principles of shared water management. These are drought prevention and mitigation, sustainable utilization of water resources and encouraging common research and technology development activities⁰.

In addition to regional water cooperation, Hungary also plays an active role in global water diplomacy. Budapest is an active facilitator of global water management cooperation in many ways. Hungary is part of many environmental treaties, such as the Kyoto and Paris agreements, which also address the issue of water security⁰. Hungary is also at the forefront of the international community in raising awareness of global water issues. At the Rio+20 conference, Hungary's role was crucial to develop a water-based SDG. As one of the main negotiators, Hungary had the opportunity to influence the agenda and shape the final proposal⁰. Hungary is also working to implement the measures of SDG6 in the national water management system and to advocate for these principles internationally. To further strengthen its status as a water management expert, Budapest hosted the largest annual meeting of water diplomacy representatives, the Global Water Summit in 2019⁰.

However, Hungary's role in water diplomacy is not only through active participation in international conferences and regional cooperation, but also through infrastructure development projects in developing countries, where help is most needed. Hungarian expertise is very useful in countries where efficient water management methods do not exist. For example, Hungarian companies have implemented irrigation systems in Ethiopia, and various water management projects in Mongolia⁰.

To summarize, Hungary is pursuing a kind of niche diplomacy with its water diplomacy efforts. This means that Hungary, as a small country, is trying to specialize in a certain sector and become an expert in it instead of being active in fields where it cannot compete with the great powers⁰. On the one hand, the Hungarian approach to water diplomacy ensures the country's water security through regional cooperation and bilateral agreements. On the other hand, by hosting and actively participating in international water conferences and summits, Hungary seeks to present itself to the world as a water management expert committed to mitigating the effects of the water crisis. This soft diplomacy approach enhances the prestige of the country and means business for export-oriented water companies.

⁰ Hungarian Investment and Trade Agency, (2013). The Hungarian Water and Sanitation Industry in the 21st century. Budapest, HITA.

⁰ Hungarian Investment and Trade Agency, (2013). The Hungarian Water and Sanitation Industry in the 21st century. Budapest, HITA.

⁰ Lasetzky, K., (2020). A discourse and practice analysis of Hungary's water diplomacy approach. Noragric Department of International Environment and Development Studies.

⁰ Lasetzky, K., (2020). A discourse and practice analysis of Hungary's water diplomacy approach. Noragric Department of International Environment and Development Studies.

⁰ OECD, (2022). Hungary's water diplomacy harnesses international action. <https://www.oecd.org/development-cooperation-learning/practices/hungary-s-water-diplomacy-harnesses-international-action-4c561d9b/>

⁰ Hungarian Investment and Trade Agency, (2013). The Hungarian Water and Sanitation Industry in the 21st century. Budapest, HITA.

⁰ Lasetzky, K., (2020). A discourse and practice analysis of Hungary's water diplomacy approach. Noragric Department of International Environment and Development Studies.

5. Indonesia's water management approach

At first glance, Indonesia does not appear to be a country with serious freshwater supply problems. The country has a tropical climate and nearly 5,700 freshwater rivers⁰. Indonesia also has no upstream neighbors, so they have full control over its rivers. Despite all these endowments, Indonesia is very much affected by water shortages. This can be traced back to the following factors:

First, Indonesia is the world's 4th most populous country in the world, with a population of 275 million. Although Indonesia is the 15th largest country in the world, more than half of the Indonesian population lives on the island of Java, making it one of the world's most overpopulated areas. Furthermore, Indonesia's population has a growth rate of 0,84%/year, which means that by 2050, there will be approximately 310 million people living in Indonesia⁰. Population growth requires an increase in food production and available freshwater resources. The required amount of freshwater can only be achieved through more efficient water management methods.

Second, Indonesia is a rapidly developing economy. The country is often referred to as a "Tiger Cub Economy", a term that refers to five Southeast Asian developing countries (Malaysia, Indonesia, the Philippines, Thailand, and Vietnam)⁰. These countries are following the example of "Tiger countries", like South-Korea or Singapore, in achieving a developed economy and a welfare state. To achieve this, Indonesia needs to shift from an agriculture-based economy to an industry- and service-based economy. The industrialization associated with this economic shift is a highly water-intensive process, and the freshwater supplies are also heavily polluted by industrial production. It is also worth mentioning that industrialization and population growth together trigger a boom in urbanization, which is also a water-intensive process.

The third factor is the geographical difference in the concentration of population and freshwater resources. As mentioned above, the center of population in Indonesia is the island of Java, which is also the center of the Indonesian industry and economy. In contrast, the largest freshwater supply can be found in West Papua, at around 280,000 m³ per capita per year. By comparison, Java Island has about 2,000 m³ per capita per year available freshwater⁰. This disparity between supply and demand creates problems for water supply.

Last but not least, the pollution of Indonesia's rivers is a major challenge for the country. Rapid industrialization and urbanization have severely damaged the environment, resulting in the pollution of major rivers. Due to the lack of water purification systems, the quality of water in urban areas is very poor and unfit for human consumption. More than 30% of Indonesian households have to rely on this poor-quality water, while drinking water is being commercialized⁰. In addition, the contaminated water used for irrigation also degrades the quality of the food grown. It implies that contaminated food and water pose significant health risks to poorer people.

⁰ USAID, (2022). INDONESIA High-Priority Country Plan, USAID.

⁰ Purnomo, B., (2018). Indonesia's Demographic Future. Jakarta, Universitas Praseyitiya Mulya.

⁰ Panha, H. & Niblock, S. J., (2014). Rise of the 'tiger cub' economies: an empirical investigation of Southeast Asian stock market efficiency. *International Journal of Economics and Business Research*, 8(4), 474-489.

⁰ Fulazzaky, M. A., (2014). Challenges of Integrated Water Resources Management in Indonesia. *Water*, 6(1), 2000-2020.

⁰ Fulazzaky, M. A., (2014). Challenges of Integrated Water Resources Management in Indonesia. *Water*, 6(1), 2000-2020.

Regarding water purification, two things were very striking during my stay in Jakarta. First, the rivers and canals in Jakarta are very polluted, due to irresponsible environmental management. Linked to this is one of the biggest problems with Jakarta, highlighted by my interviewees: the city is sinking. According to current estimates, the coastal part of Jakarta could be under water by 2050, as the city is sinking by about 20 cm a year⁰. This can be traced back to three factors. First, overpopulation and rapid urbanization in the Jakarta metropolitan region led to excessive groundwater extraction. Second, unregulated development causes uncontrolled deforestation and land subsidence. Third, climate change and rising sea levels are posing a danger on the shores of North Java Island⁰. That is the main reason why the Indonesian government is so invested in the Nusantara project, which is about building a new administrative capital city on Borneo Island.

The second issue regarding water management in Indonesia is that tap water is not drinkable at all, due to the high level of contamination. In this case, poor water treatment practices are only one side of the coin: There is no will on the part of the government and economic actors to change this, as the extraction and bottling of mineral water is a fairly lucrative industry in the country, and making tap water drinkable would therefore be against economic interests. Moreover, there is no social demand for potable tap water. However, this method is a major source of environmental pollution, as the recycling of many plastic bottles is not solved.

6. Implementation of IWRM in Indonesia

Nowadays the most widely accepted comprehensive water management method is Integrated Water Resources Management (IWRM). In SDG6 about clean water and sanitation, one of the explicit goals set for 2030 is to implement Integrated Water Resources Management at all levels around the world⁰. IWRM recognizes that water is a finite and vulnerable resource that is essential for human survival, economic development, and environmental well-being. This approach seeks to balance the various needs and demands on water resources while also considering the long-term sustainability of water ecosystems.

Under the IWRM approach, all stages of the water cycle, including groundwater, surface water and rainwater are taken into account⁰. IWRM also manages water for multiple uses, for example drinking water, irrigation, and water for industrial purposes. This approach is designed to ensure that as much of the water used as possible is returned cleanly to the natural water cycle.

In IWRM, it is also important to create the possibility of stakeholder engagement in all sectors regarding water management⁰. In order to work effectively on water conservation, government agencies, local authorities, water management companies, NGOs and foreign investors need to cooperate closely. This is important because IWRM's main tool to achieve

⁰ Pradana, A. et al., (2023). It's Sinking: Coastal Cities of Jakarta and Semarang, Indonesia. online, Cambridge University Press.

⁰ Pradana, A. et al., (2023). It's Sinking: Coastal Cities of Jakarta and Semarang, Indonesia. online, Cambridge University Press.

⁰ UNDP, (2023). Goal 6: clean water and sanitation. https://www.undp.org/sustainable-development-goals/clean-water-and-sanitation?gclid=Cj0KCQjw0vWnBhC6ARIsAJpJM6djs_xNjN_iZwSaRcWN9dbhO1az8pjzMFv1vpOcDVxlOcVLaDI8P-IaAo1MEALw_wcB

⁰ World Bank, (2021). A National Framework for Integrated Urban Water Management in Indonesia, Washington D.C.: World Bank.

⁰ Fulazzaky, M. A., (2014). Challenges of Integrated Water Resources Management in Indonesia. *Water*, 6(1), 2000-2020.

sustainability in water management is integrating the different sectors that have any water-related activities and make mutual plans for resource management. This can happen through Water Agencies, a governmental organization whose task is to regulate and coordinate basin-level management among divergent water-using sectors⁰. These agencies can specialize in different types of water management, such as wastewater treatment or flood control, based on the needs of local stakeholders.

The framework of IWRM is taken on a national level and consists of five main areas: law and regulation, governance, planning and implementation, information management and financing⁰. At law and regulation, the government has to create the legal framework for the implementation of IWRM. At governance, the government has to create the institutional framework and coordinate the actions of the actors. Planning and implementation are needed to ensure the effectiveness of resource-management. Information management is essential to get feedback and to make the planning process more effective. Financing is also an important question: the funding needs to be diversified in order to avoid financial problems⁰.

7. Hungarian water management project opportunities in Jakarta metropolitan area

Jakarta and its surrounding area (which consists of Bogor City, Depok City, Bekasi City, Tangerang City, and their surrounding areas) is the heart of Indonesia⁰. More than 30 million people live in the Jakarta metropolitan area, and it is the center of Indonesian industrial production. Jakarta has already faced water security issues, resulting from centuries of poor water management and climate change. The city is situated on low-lying coastal land and is prone to flooding during the rainy season, exacerbated by rapid urbanization, and sinking land due to excessive groundwater extraction. The main river in Jakarta, called Citarum is the world's most polluted river, due to the irresponsible and environmentally destructive water use by Indonesian industrial companies⁰.

As it was mentioned before, Hungary and Indonesia have already had a successful water management cooperation. In 2013, 36 Indonesian cities were provided with low-capacity mobile water treatment systems worth USD 36 million under an investment awarded by a Hungarian municipal company Fővárosi Vízművek (Budapest Waterworks)⁰.

I found the sector of wastewater management and water purification to be the most adequate area to initiate further cooperation between Hungary and Indonesia. Hungary has many companies that have the innovative mindset and the international experience to undertake such a project.

⁰ Fulazzaky, M. A., (2014). Challenges of Integrated Water Resources Management in Indonesia. *Water*, 6(1), 2000-2020.

⁰ World Bank, (2021). *A National Framework for Integrated Urban Water Management in Indonesia*, Washington D.C.: World Bank.

⁰ World Bank, (2021). *A National Framework for Integrated Urban Water Management in Indonesia*, Washington D.C.: World Bank.

⁰ Aritenang, A. F., (2023). Identifying post-suburbanization: The case of the Jakarta metropolitan area (JMA). *Habitat International*, 138(102857), 1-9.

⁰ Ardinsyah, F., Marthen, A. A. & Amalia, N., (2015). *Forest and land-use governance in a decentralized Indonesia: A legal and policy review*, Bogor: Center for International Forestry Research.

⁰ Magyarország jakartai nagykövetsége, (2023). *Gazdasági kapcsolatok - Indonézia*. <https://jakarta.mfa.gov.hu/page/gazdasagi-kapcsolatok-indonezia>

Take the example of Organica, a Budapest-based company that specializes in wastewater management and has created many innovative technologies in that sector. They have built several wastewater plants in metropolises like Vancouver and Shanghai. Organica's technology is based on a green method where wastewater is cleansed by complex ecosystems⁰. The water flows through different reactors, where microorganisms, aquatic flora and fauna consume the contaminants. In addition to being cost-effective and sustainable, Organica's wastewater treatment plants also offer advantages over conventional water treatment plants in terms of urban planning. These plants are much smaller than the conventional wastewater facilities, and due to the botanical garden-like design, these plants fit aesthetically into a green cityscape.

This investment would be greatly helped by the company's existing relationship with the Indonesian water sector: in 2015, Organica completed the expansion of the wastewater treatment plant in Indonesia's largest industrial park, MM2100⁰. As the cooperation was successful, the first Organica wastewater treatment plant in Karawang province was completed in 2016, as part of a government project to clean the Citarum River⁰. Currently there are four operating facilities in Indonesia built by Organica, and another four are yet to be constructed. They also have a regional office in Jakarta.

Another way to strengthen the already existing wastewater management cooperation between Hungary and Indonesia is exporting more HERON Small Capacity Water Treatment Units. This technology was invented by Budapest Waterworks in order to solve the problem of wastewater management in smaller/segregated communities and to create a temporary solution in case of a water crisis⁰. It would also be useful in parts of the Jakarta metropolitan area where constructing new wastewater treatment facilities would not be possible due to the high level of urbanization. However, HERON mobile units are not capable of providing a clean freshwater supply to a large population, as the capacity of a unit is about 30-40 m³/day, which is far below the capacity of an average wastewater treatment plant of 10,000 m³/day⁰.

Organica and Budapest Waterworks already have links with the Indonesian water sector, and this provides an excellent opportunity for other Hungarian companies to work with them to bring their products to the Indonesian market. The cooperation among Hungarian water management companies is managed through the Hungarian Water Treatment Cluster, whose goal is to bring together Hungarian companies related to the water sector in order to enhance the cooperation among them, harmonize their development and innovation projects and create joint projects abroad⁰. Take the example of Aquacust, a Hungarian company and a member of the Hungarian Water Treatment Cluster, which specialized on water-loss analysis and network monitoring⁰. Expertise on the field of analysis and monitoring is essential to assess the weaknesses of Indonesian wastewater treatment and to effectively react to any issue that

⁰ Organica, (2023). Process background. <https://www.organicawater.com/process-background>

⁰ Organica, (2023). Surya Cipta, Karawang, Indonesia. <https://www.organicawater.com/case-study/surya-cipta-karawang-indonesia/>

⁰ Organica, (2023). Bekasi, West Java, Indonesia. <https://www.organicawater.com/case-study/bekasi-west-java-indonesia/>

⁰ Budapest Waterworks, (2024). Heron - Small Capacity Water Treatment Unit. <https://www.vizmuvek.hu/en/home/international-solutions/heron>

⁰ Budapest Waterworks, (2024). Heron - Small Capacity Water Treatment Unit. <https://www.vizmuvek.hu/en/home/international-solutions/heron>

⁰ Hungarian Investment and Trade Agency, (2013). The Hungarian Water and Sanitation Industry in the 21st century. Budapest, HITA.

⁰ Aquacust, (2023). *Water-loss analysis and detection of hidden leakages*. <http://www.aquacust.hu/en/water-loss-analysis-and-detection-hidden-leakages>

arises. Geotermia is another member of the HWTC, whose experience is crucial for the development of the Jakarta wastewater network. Geotermia specializes in geospatial analysis and system development for utility companies.

In my further discussions with local actors, two other areas emerged where Hungary could cooperate with Indonesia in water management. The first is the use of nanotechnology in water management. This technology can be an effective and cheap way to purify water from nano-level molecules. Carbon nanotubes and graphene oxide are very effective against heavy metals and organic pollutants. However, this method alone is not sufficient to fully purify the wastewater, it can only complement other water purifying methods⁰. There are several Hungarian companies that specialize in the use of nanotechnology, and Hungarian universities are also doing research in this field, so there is potential for scientific cooperation in this area.

The second area, in which Hungary could cooperate with Indonesia is wastewater management in industrial parks. In my research project, I mentioned Organica wastewater plants as a possible solution to mitigate the water pollution caused by industrial parks.

8. Conclusion

Hungary and Indonesia are basically two culturally and economically quite distant countries, but the issue of water diplomacy brings the two countries to the same table. Hungary has a wealth of experience in water management due to its geography and history. In order to apply this expertise in international business, Hungary must also be at the forefront of international water diplomacy efforts. Hungary is committed to the mitigation of the water crisis internationally and to meeting the water-related goal of the UN Sustainable Development Goals. Through its water diplomacy activities, Hungary is sending a message to the world that it is a reliable and experienced partner in water management.

On the other hand, Indonesia is facing a continuous and significant population growth, which, together with industrialization and urbanization, is pushing the country into a major water security crisis. This is most acute in the Jakarta metropolitan area, which has the highest concentration of population and industrial production, and this has a very negative impact on the quality of the local freshwater supply.

Hungarian water companies have the necessary experience to at least partially address the water shortage caused by inadequate wastewater treatment in the Jakarta metropolitan area. To this end, several Hungarian water projects have been implemented in Indonesia in recent years. However, the aim should be to continue these successful cooperations and to involve more Hungarian companies in investments in the Far East.

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Shared Futures: Empowering Cooperation between Hungary and Indonesia

Csanád Medgyesi

1. Abstract

The paper "Shared Futures: Empowering Cooperation between Hungary and Indonesia" explores the potential for cooperation between Hungary and Indonesia in various domains such as history, culture, economics, and diplomacy. Despite their apparent differences, the two countries share historical parallels and face similar challenges, presenting opportunities for collaboration. The abstract delves into the history of Indonesia, drawing parallels with Hungarian history and highlighting significant events such as the Kingdom of Srivijaya, Dutch colonial rule, and Indonesia's struggle for independence. It also addresses key areas of cooperation, including economic relations, tackling overpopulation, mitigating natural disasters, enhancing diplomatic ties, and improving health cooperation. By examining Indonesia's foreign policy and drawing lessons from history, the paper aims to advocate for stronger relations between Hungary and Indonesia, emphasizing the importance of expanding ties with this diverse and strategically significant Southeast Asian nation.

2. Introduction

„*Unity in Diversity*”⁰ is the motto of a Far Eastern country⁰ with a population 278 times larger and a land area more than twenty times larger than Hungary, which is less known in detail by Hungarian society. Hungarian and Indonesian culture, history, economics, goals, and interests seem to be very different, but if we take a closer look at the two countries, we can find many similarities. But what are these similarities? Why should Indonesia's foreign policy be an example for us? What lessons can Indonesian politicians learn from Hungarian history? In which sectors can Hungarian-Indonesian joint ventures cooperate? And why is it important for us to have good relations with Indonesia and how can we expand our opening to the East? These are the questions I want to answer in the following.

3. History and Culture

3.1. A short history of Indonesia spiced with Hungarian parallels

The name of the Far Eastern country is a combination of two Greek words, *Indos* (India) and *Nesos* (island).⁰ The first strong and perhaps the most important state in Indonesian history was the Kingdom of Srivijaya, which reached its peak of prosperity during the foundation of the Hungarian state and the reign of the Árpád monarchs. The kingdom was based on the island of Sumatra and lived from maritime trade. Silk, spices, tortoiseshell, and camphor were

⁰ Szarka, E. (2016). *Egység a sokféleségben, A távoli Indonézia közelről*. Pécs: Publikon kiadó. p. 21. (in original language: *Bhinneka Tunggal Ika*)

⁰ Britannica. (2024). *Indonesia: Facts & Stats*. <https://www.britannica.com/facts/Indonesia>

⁰ Szarka, E. (2016). *Egység a sokféleségben, A távoli Indonézia közelről*. Pécs: Publikon kiadó., p. 13.

the main commodities traded in the region. At the height of the empire, they extended their power to the island of Java and the Malay Peninsula, as well as to the present-day Philippines. The rich maritime country was a desirable target for pirates and the region's powers, and in the 12th century it began to show signs of decline, exacerbated by the fact that, in addition to constant external attacks, a significant proportion of the people of Srivijaya had converted to Islam. Eventually, almost simultaneously with the demise of the Árpád dynasty, the Kingdom of Singhasari conquered the weakened state, which by the 1400s had disappeared into the mists of history. Dapunta Hyang Sri Jayanasa, the founder of the kingdom of Srivijaya, was unable to create a lasting state like St. Stephen's in our country.⁰

At the beginning of the 16th century, the dominant powers in the region fell apart, with first the Portuguese, then the Spanish, and later the Dutch setting foot in the archipelago. The Dutch established the United East India Company, which gave the Netherlands a thriving colonial empire and influence in the region for over 200 years.⁰ It was during this period that Batavia, now known as Jakarta and the capital of Indonesia, developed as a center. It is important to note that the founding of the city is linked to the victorious battle against the Portuguese a year after the Battle of Mohács.⁰ Dutch rule lasted until the early 19th century, when the French conquered the Dutch mainland, and its colonies were annexed by France. These overseas territories were recovered by the Netherlands at the end of the century. During the Second World War, the islands were invaded by the expanding Japanese, who were cruel to the population. Following the Japanese surrender in 1945, Sukarno proclaimed the independent Republic of Indonesia.⁰ The Dutch attempted to retake the former colony in yet another act of war but were unable to stop the de facto independence of the 18,000-island nation in 1949 under President Sukarno.⁰ Suharto, who had led the country for more than two decades, was succeeded as president by Suharto, who during his reign promulgated the so-called *Orde Baru*, or New Order policy, which sought centralization and saw a real increase in general prosperity, rising wages and improved living conditions until his fall in 1998. These thirty-three years, and especially the 'Suharto consolidation', have been compared to the János Kádár consolidation in Hungary.⁰ Two leaders, two different lives, but similar destinies. Two Heads of State who were initially disliked by the people, but who later, over time, grew accustomed to them, and then, after their downfall, remained as divisive characters in the history of their countries.

3.2. The colorful culture of Indonesia

Indonesia is not a homogeneous country, it is extremely colorful and, in many cases, divided along linguistic and religious lines. Ethnic relations are as fragmented as they were in pre-Trianon Hungary, with the very important difference that the people of Indonesia are united by the so-called Pancasila state philosophy, which encapsulates the most essential Indonesian values in the five national principles and creates a sense of belonging among the islanders. If we try to find a similar idea of community cohesion in the history of our country, then, with a deliberately imperfect historical parallel, the Pancasila principle is a bit like the „*Hungarus*

⁰ Szczepanski, K. (2020). The Srivijaya Empire. ThoughtCo, 23 January 2020. [thoughtco.com/the-srivijaya-empire-195524](https://www.thoughtco.com/the-srivijaya-empire-195524).

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⁰ Szczepanski, K. (2020). The Srivijaya Empire. ThoughtCo, 23 January 2020. [thoughtco.com/the-srivijaya-empire-195524](https://www.thoughtco.com/the-srivijaya-empire-195524).

⁰ Szarka, E. (2016). Egység a sokféleségben, A távoli Indonézia közelről. Pécs: Publikon kiadó., p. 20.

⁰ Novák, T. (2018). *60 Years of Hungarian Indonesian Relations*. Budapest: Budapesti Gazdasági Egyetem. p. 11.

consciousness” idea that united the peoples of the medieval and early modern Kingdom of Hungary, giving them a sense of belonging to the country regardless of nationality.

The first principle of Pancasila is „*Kebangsaan Indonesia*”, which emphasizes that Indonesia is a united nation, characterized by solidarity between ethnic groups and the territorial integrity of more than 18,000 islands. The second is „*Internasionalisme*” the idea of equal treatment for all Indonesians in the country, regardless of nationality or ethnicity.⁰ The third is the „*Musyawarah*” a democratic state organization based on a deliberative and consensual approach by elected decision-makers, giving a voice to all the people of the country.⁰ The fourth is the „*Kesejahteraan Sosial*”, which seeks to advance the welfare of the people through social equality and justice.⁰ Finally, the fifth is the „*Ketuhanan yang Berkebudayaan*” which strengthens religious communities in the country by mandating compulsory monotheism for all.⁰

Apart from ethnic and religious divisions, Indonesia is of course not united in terms of languages. More than 800 languages are spoken in different parts of the country, of which Java, Sundanese, and Malay are the most prominent, with approximately half of the population speaking these three languages as their first language.⁰ The only official language spoken on the island is *Bahasa Indonesia*, or Indonesian,⁰ spoken by nearly 200 million people today⁰ and, like English in India, it is understood by almost everyone. Indonesian uses Latin letters and has adopted many expressions from English, Dutch, Arabic, and Chinese. It is an isolating language and, in most cases, like Hungarian, it does not use gender in conjugation and often uses the relative clause in communication.⁰

Cooperation between higher education institutions is one of the main pillars of Indonesian-Hungarian cultural relations. The *Stipendium Hungaricum*, established in 2013, provides the most talented foreign students with the opportunity to study in Hungary. Since 2016, Indonesian students have also had the opportunity to study in a Hungarian higher education institution.⁰ Hungarian students can even apply for the *Darmasiswa* scholarship program, which offers the lucky student the opportunity to study in 54 higher education institutions in Indonesia. Hungary has been a member of the scholarship program since 1976, which was established in 1974.⁰

4. Hungarian-Indonesian Economic Relations

The two countries established diplomatic relations a year before the 1956 revolution. During these short seventy years, Hungarian-Indonesian relations have been on a pragmatic and

⁰ Szarka, E. (2016). *Egység a sokféleségben, A távoli Indonézia közléről*. Pécs: Publikon kiadó., p. 20.

⁰ Mulyani, M. (2017). *The Analysis of Soekarno's Speech on Nation Foundation: Demystifying the Ideology of Pancasila Using Foucauldian Methods*. Atlantis Press.

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⁰ Darfin, D., Koryati & Masna Evawati, N. (2022). Introducing the values of Pancasila. *Holistics Journal: Hospitality and Linguistics*, 14(1), pp. 1-12.

⁰ UNOCHA. (2010). *2010 Indonesian Population Census*. OCHA Admin boundaries for Indonesia.

⁰ Constitution of the Republic of Indonesia (1945) CHAPTER XV; Article 36

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⁰ Novák, T. (2018). *60 Years of Hungarian Indonesian Relations*. Budapest: Budapesti Gazdasági Egyetem. p. 14.

⁰ Darmasiswa Indonesian Scholarship. (2016) *About Us*. Bureau of Cooperation and Public Relations. <https://darmasiswa.kemdikbud.go.id/about-us-2/>

developing path. In 1988, the Joint Commission on Bilateral Affairs (JCEC) was established⁰, but the first significant agreement had to wait until October 1989, when the double taxation treaty was concluded.⁰ Economic relations between the two countries were briefly hampered by the end of the Indonesian *Orde Baru* and the subsequent economic collapse. After the 2000s, the economy of the Far Eastern country and bilateral relations were reinvigorated. In 2003, the parties agreed to protect investments in both countries, which contributed to a nearly six-fold increase in trade between Indonesia and Hungary in 10 years, between 1993 and 2003.⁰ In 2005, an economic cooperation agreement was signed between the two parties and in 2007, Hungary's trade with Indonesia reached a total value of nearly USD 115 million.⁰

The relationship between the two countries has not deteriorated since the change of government in 2010, and in 2016 Prime Minister Viktor Orbán and President Joko Widodo held bilateral talks to expand cooperation between the two countries in the energy, services, rail transport and financial sectors. Hungary also decided to invest USD 20 million in the construction of a 5-megawatt solar power plant in North Sumatra.⁰ Bilateral trade in goods has continued to grow every year, with Hungarian exports to Indonesia increasing by 18% year-on-year in the first 10 months of 2018. At the end of the decade, the main sectors were health, telecommunications, and water management. By the end of 2019, Hungarian companies had built 36 mobile water treatment plants in Indonesia.⁰ During the nearly ten years of Orbán's administration, Hungary's trade turnover in the Far East has increased by 29%.⁰

The year 2020 is rightly associated with the horrific coronavirus pandemic, but it is an extremely important date for Hungarian-Indonesian relations, as the two countries established diplomatic relations 65 years ago. In November this year, for the second time after 2018, a virtual forum and conference called #HUNINDOTECH was held to showcase the potential of Hungarian companies operating in the region.⁰ Closely linked to this forum was the success of Roatex Ltd. Zrt., the biggest economic deal between the two countries to date. The Hungarian company won the contract to build and operate the electronic toll collection network for the whole of Indonesia. This is a big feather in its cap, as it beat out competitors such as experienced Russian businessman Arkady Rotenberg's company.⁰ Of particular note is that the USD 300 million contract is one of the largest technology exports in the country's history. The

⁰ Ministry for Foreign Affairs of the Republic of Hungary. (2014). *The Hungarian - Indonesian economic relations* http://www.mfa.gov.hu/kulkepviselet/ID/en/en_Bilateralis/en_bi_eco.htm?printable=true

⁰ ASEAN Briefing. (1989). *Agreement between the government of the Republic of Indonesia and the government of the Hungarian People's Republic for the avoidance of double taxation and the prevention of fiscal evasion with respect to taxes on income*

⁰ Ministry for Foreign Affairs of the Republic of Hungary. (2014). *The Hungarian - Indonesian economic relations* http://www.mfa.gov.hu/kulkepviselet/ID/en/en_Bilateralis/en_bi_eco.htm?printable=true

⁰ Budapest Business Journal (2016). Orbán discusses economic cooperation in Jakarta. *Budapest Business Journal*, 1 February 2016. <https://bbj.hu/politics/foreign-affairs/visits/orban-discusses-economic-cooperation-in-jakarta>

⁰ Indonesia Investments (2016). Indonesia & Hungary: Bilateral Trade, Investment & Relations. *Indonesia Investments*, 2. February 2016. <https://www.indonesia-investments.com/news/todays-headlines/indonesia-hungary-bilateral-trade-investment-relations/item6451>

⁰ Magyarország Kormánya. (2019). *Dinamikusan fejlődnek a magyar-indonéz kapcsolatok*. <https://2015-2019.kormany.hu/hu/kulgaszdasagi-es-kulugyminiszterium/gazdasagdiplomaciaert-felelos-allamtitkar/hirek/dinamikusan-fejloznek-a-magyar-indonez-kapcsolatok>

⁰ Magyarország kormánya. (2020). *Tíz év alatt 29 százalékkal nőtt Magyarország kereskedelmi forgalma Indonéziában*. <https://kormany.hu/hirek/tiz-ev-alatt-29-szazalekkal-nott-magyarorszag-kereskedelmi-forgalma-indoneziaban>

⁰ HunIndoTech (2023). *Technology based Hungarian-Indonesian Business Forum*. <https://www.hunindotech.id/>

domestic company has developed a state-of-the-art cash and contactless payment system on Indonesia's 6,000 km road network.⁰ In the same year, the two countries' foreign ministers signed a Memorandum of Understanding to establish a joint (Indonesia-Hungary Investment Fund (IHIF)) USD 250 million investment fund, mainly to support infrastructure development in Indonesia.⁰

5. Opportunities, obstacles, and solutions for cooperation between the two countries

5.1. Overpopulation

When I asked the enthusiastic and kind young students at Atma Jaya University in Yogyakarta how we could solve the demographic deficit in Europe and Hungary, one of them replied: *"I think that in Europe they overcomplicate it, because they want a career first, then they want to have a decent financial existence, and then they want to start a family, whereas in our country the priority is to start a family and it is based on the principle of 'I like you and you like me, then let's have a child'"*, which means that we always put the family first.

The South-East Asian country also has demographic problems, but while ours is a demographic deficit, they have a huge population increase. In Indonesia, there is a saying: *„Indonesian children grow faster than wheatear”*.⁰ Population growth in former colonial countries, which are developing at an extremely rapid pace, is a huge challenge. This major problem affects most countries in Southeast Asia, such as Thailand, Malaysia, and the Philippines. This challenge has been faced by the incumbent government since the creation of the Indonesian state. While there were roughly 165 million⁰ people living on the islands in the mid-1980s, this has risen to nearly 280 million⁰ by 2023, an increase of almost 59% in nearly 40 years.⁰ With this gigantic increase, the Southeast Asian country can claim to be the fourth most populous country on Earth, ahead of big players such as Pakistan, Russia, and Brazil. On the surface, this is only a problem because of the distribution of land, but on the one hand, the enormous population growth has made and is making already congested areas even more congested and the population is not evenly distributed in a country of one million eight hundred thousand square kilometers, and on the other hand, with this explosive population growth, the state is unable to solve the various infrastructural, social and ecological problems that are arising. In the transport sector, for example, the Indonesian State Railways, or *Kereta Api Indonesia*, is not fully able to meet the increased demand, even though successive Indonesian governments have made many improvements to public

⁰ Brückner, G. (2021). A magyar cég, amelyik legyőzte Putyin dollármilliárdos dzsúdós haverját Indonéziában. *Telex*, 4. February 2021. <https://telex.hu/gazdasag/2021/02/04/a-magyar-ceg-amelyik-legyozte-putyin-dollarmilliardos-dzsudos-haverjat-indoneziaban>

⁰ Ferkelt, B. (2021). Indonézia, a nagy tigris - magyar sikerek és lehetőségek. *Corvinák*, 25 March 2021 <https://corvinak.hu/gazdasag/2021/03/25/indonezia-a-nagy-tigris-magyar-sikerek-es-lehetosegek>

⁰ Rahman, D. F. (2021). Hungary commits \$250m to new joint investment fund. *The Jakarta Post*, 22 April 2021. <https://www.thejakartapost.com/news/2021/04/22/hungary-commits-250m-to-new-joint-investment-fund.html>

⁰ Szarka, E. (2016). Egység a sokféleségben, A távoli Indonézia közéről. Pécs: Publikon kiadó., p. 27

⁰ Indonesia Central Bureau of Statistics (2023). *Mid Year Population (Thousand People), 1960-2015*. <https://www.bps.go.id/en/statistics-table/2/MTk3NSMy/mid-year-population--thousand-people-.html>

⁰ CIA World Factbook (2024). *Indonesia*. <https://www.cia.gov/the-world-factbook/countries/indonesia/#people-and-society>

⁰ Lantos, Zs. (2018). Indonézia: Népesedési trendek és gazdasági következmények. In: Cs. Moldicz, (Ed.), *Kína, Indonézia és Vietnam-Geopolitikai összefüggések a 21. században..* Budapest: Budapesti Gazdasági Egyetem, pp. 87-114. p. 89.

transport by rail in recent decades. Another very important issue is the increase in living standards. Going back to my earlier point, rapid population growth cannot be matched by wage growth, as sustainable economic growth is essential to ensure that population growth does not push many into poverty. The poverty problem just mentioned is particularly striking in Indonesia because 16.2% of the total population lives in extreme poverty, which is equivalent to 40 million people, or four times the number of people in Hungary living in such poor conditions.⁰ Extreme poverty means that these people live on average on less than USD 1.25 a day per person.⁰ In the Southeast Asian region, only the Philippines has a similar level of poverty, while many similar countries, such as Thailand and Malaysia have much more moderate indicators.

5.1.1. Proposed solution to the problem of overpopulation

Generally speaking, the greater the problem of poverty and the related problems of access to health care, poor living conditions, and drinking water in a country, the greater the problem of overpopulation. The correlation between poverty and overpopulation is evident, particularly in developing countries and disadvantaged regions. In smaller towns and villages, family planning becomes less predictable due to various socioeconomic factors. One anthropological reason behind this is the lack of predictability in childbirth survival, leading parents to plan for more children as an insurance policy for the family line and traditions. This is mainly the case in developing countries, where it is also prevalent in the more disadvantaged regions and especially in smaller towns and villages. In my opinion, there is an anthropological reason for this. For those of us who belong to the western, developed part of the world, it is quite natural that we hardly ever see any cases of a mother dying during childbirth in our circle of acquaintances, so that family planning is more predictable. Unfortunately, this is not the case everywhere, as in many places, including Indonesia, parents plan to have more children in order to ensure that 8 or 9 of the 12 children they plan to have, for example, live to adulthood and carry on the family line and traditions. This is a kind of conscious and somewhat exaggerated subsistence that can be eliminated from people's mentality by improving living conditions and spreading education, as we have seen in the history of Western Europe, for example. In the past, important but insufficient results were achieved by the *Dua Anak Cukup!* movement, which was based on the idea that two children are enough for a family and that no more than that is needed for a family to survive. This campaign respected the religiously diverse Indonesia, where Muslims typically have many children, while Christians oppose artificial birth control.

Currently, the proportion of Indonesians over 15 years of age who are completely uneducated and drop out of primary school is nearly 12.5%, while the proportion of university graduates is only 10.1%.⁰ To address overpopulation, there is a need for a multifaceted approach, with a focus on improving living conditions and spreading education. The success (or so-called success) of Western Europe in controlling population growth through improved living conditions and education serves as a precedent. Historical initiatives like the mentioned *Dua Anak Cukup!* movement, advocating for two children as sufficient for a family, yielded partial success but faced challenges in religiously diverse Indonesia, where different faiths have varying views on birth control. To stop overpopulation, an education policy similar to the plan

⁰ Lantos, Zs. (2018). Indonézia: Népesedési trendek és gazdasági következmények. In: Cs. Moldicz, (Ed.), *Kína, Indonézia és Vietnam-Geopolitikai összefüggések a 21. században..* Budapest: Budapesti Gazdasági Egyetem, pp. 87-114. p. 105.

⁰ Lantos, Zs. (2018). Indonézia: Népesedési trendek és gazdasági következmények. In: Cs. Moldicz, (Ed.), *Kína, Indonézia és Vietnam-Geopolitikai összefüggések a 21. században..* Budapest: Budapesti Gazdasági Egyetem, pp. 87-114. p. 105-106.

⁰ Statista.com (2023). *Share of Indonesian population over 15 years old in 2022, by highest education level.*

of the eminent cultural politician Kuno Klebersberg should be implemented in the Far Eastern country. But what does this mean? It means bringing quality education to the smallest villages and providing it for all. If more people have access to knowledge, then there will be a much greater proportion of graduates in society, which in the long term could lead to the emergence of a new career path in which a mass of women and men want to build intellectual careers. Implementing an education policy plan could be instrumental in curbing overpopulation. This entails bringing quality education to even the smallest villages, ensuring accessibility for all. A well-educated society tends to delay family planning. Couples will thus also want to plan a family later and with fewer children. Excellent, ambitious, and competent Hungarian electronics start-ups and companies like Roatex could help spread education and bring the two countries closer together. Furthermore, an education reform in Indonesia, named after a national hero like Pramodya Ananta Toer, could draw inspiration from Hungary's internationally recognized education system. Exporting the achievements of the Hungarian education system to Indonesia would contribute to addressing the challenges associated with overpopulation. Through collaborative efforts and shared expertise, Hungary and Indonesia could work towards a sustainable solution for their respective demographic issues.

5.2. Natural disasters

The entire region of Southeast Asia has a tropical climate, as it is close to the equator, so the weather is usually mild and humid from April to October, making Indonesia a popular destination for holidaymakers. Despite the excellent tropical weather, it is important to note the other side of the coin, the rainy, wet season from November to March. This is the period when tourists are less likely to visit the country, but unfortunately, Indonesia is very exposed to natural disasters. In 2022, Indonesia suffered the most natural disasters after the United States of America, with the Far East having to deal with 20 natural disasters that year.⁰ Furthermore, last year nearly 900 people lost their lives or went missing in natural disasters, the worst of which, the West Java earthquake, claimed at least 600 lives in the country.⁰ What is quite astonishing is that 20.07 thousand homes were severely damaged in 2022. Natural disasters are recurring problems that place a huge burden on the Indonesian people and state, and while it is not possible to completely prevent every hurricane, earthquake, or tsunami, modern and advanced technology can reduce the material damage and human casualties. In the face of natural disasters, prioritizing human life becomes paramount, recognizing its unique and irreplaceable nature. While material damage can be restored, every individual lost is an irreversible loss. Consequently, extending the activities of the non-profit organization Hungary Helps to the Southeast Asian region, particularly Indonesia, emerges as a crucial step.

5.2.1. Proposed solutions to alleviate the difficulties caused by recurrent natural disasters

In natural disasters, the most important thing is human life, as material damage can be repaired, but every life is unique and unrepeatable, so the first place to extend the activities of the non-profit organization Hungary Helps would be to the Southeast Asian region, especially Indonesia. On the one hand, as the famous saying goes, "*a friend in need is a friend in need*", so regular humanitarian aid could bring the friendship between the two countries even closer, and on the other hand, the Hungary Helps program could also serve one of the main purposes of the aid, namely to help Christian communities far from Hungary, as 7% of the country's

⁰ Statista.com (2023). *Statista.com, Countries with the most natural disasters in 2022.*

⁰ Statista.com (2023). *Number of persons killed or reported missing by natural disasters in Indonesia in from 2016 to 2022*

population belongs to a Protestant denomination and 2.9% are Catholic⁰, so there are nearly 30 million Christians living in Indonesia.

The other is a kind of fusion of cultural and economic cooperation. We Hungarians do not have a particularly large military capacity or economic power, so we can rely on our wisdom and creativity in most cases. So it is with these Hungarian achievements that we must gain prestige in international politics. We need even closer cooperation with the developers, inventors, and contractors of electronic systems for the prevention of natural disasters in both countries. A good example is the Hungarian research group Wigner FK, which is studying volcanic eruptions. Their results so far suggest that cosmic muon imaging of volcanoes may explain the relationship between the frequency of volcanic eruptions and ground deformation.⁰ The success of the research would be particularly important for Hungarian-Indonesian relations, as Indonesia has the most active volcanoes in the world, with 10 major ones erupting last year.⁰ Interestingly, Indonesia is also home to the Krakatau volcano, whose 1883 eruption is even depicted in Edvard Munch's painting *The Scream*, as the gigantic eruption has given rise to a worldwide phenomenon of celestial interest.⁰ Moreover, the National University of Public Service's Coastal Research Workshop⁰ aims to develop research plans and objectives focused on flood management. By studying the dynamics of coastal areas and conducting related flood research, this initiative can provide valuable insights to aid Indonesia in enhancing its defenses against floods and tidal surges. The research framework includes an exploration of effective flood prevention strategies, which, when implemented, can significantly contribute to Indonesia's resilience against the threats posed by floods and inundations. In conclusion, Hungary's multifaceted approach, combining humanitarian aid and technological collaboration, showcases the nation's commitment to global responsibility and cooperation. By extending its helping hand to Southeast Asia, Hungary not only addresses immediate challenges but also lays the foundation for enduring friendships and shared endeavors in disaster resilience and scientific innovation.

5.3. Diplomatic cooperation

The distinct international spatial positions of Hungary and Indonesia create a unique landscape for diplomatic collaboration. While Hungary holds a relatively modest position within the European Union and acts as a middle power in Central-Eastern Europe, Indonesia, with its potential for future global influence, stands on the brink of becoming a world power. Two crucial aspects shaping Indonesia's trajectory are its remarkable economic growth and its judicious foreign policy. Indonesia could potentially become a world power in the future, as it has everything it needs. Probably the two most important aspects of Indonesia's development are high economic growth and a prudent foreign policy. The first aspect seems to be coming true, as all the signs are that within a few years the Indian and Indonesian economies will be the fastest growing in the world. On the second point, Indonesia is effectively a country of a thousand friends and zero enemies. It is equally capable of maintaining excellent economic

⁰ U.S. Department of State. (2022). *2022 Report on International Religious Freedom: Indonesia* <https://www.state.gov/reports/2022-report-on-international-religious-freedom/indonesia/>

⁰ Papdi-Pécskő, V. (2023). *Hungarian instrument could be the solution to volcanic eruptions*. Index. 4. March 2023 <https://index.hu/techtud/2023/03/04/japan-vulkan-szakuradzsim-kozmikus-muon-kepalkotas-kitores-talajmozgas-elkh-wigner-fk/?token=e0b781baa1dca43a2741e95cab267430>

⁰ Smithsonian Institution Global Volcanism Program. (2024). *What was erupting in the year?* <https://volcano.si.edu/faq/index.cfm?question=eruptionsbyyear&checkyear=2022>

⁰ Panek, R. (2004). ART; 'The Scream,' East of Krakatoa. *The New York times*, 8. February 2004. <https://www.nytimes.com/2004/02/08/arts/art-the-scream-east-of-krakatoa.html>

⁰ NKE Víz Tudományi Kar. (2023). *Kutatási terv és célrendszer*. <https://vtk.uni-nke.hu/kutatas-es-tudomanyos-élet/hullamteri-kutatomuhely/kutatasi-terv-es-celrendszer>

relations with the United States and China. Furthermore, since the outbreak of the Russian-Ukrainian war, President Joko Widodo has held talks with Vladimir Putin⁰ and Volodymyr Zelensky⁰. This skillfully applied neutrality is a guiding principle because it is in no one's interest to weaken the Indonesian economy, on the contrary, the two current world superpowers have an interest in boosting Indonesia.

5.3.1. A solution to boost diplomatic relations

In aligning Hungary's diplomatic strategy with its unique position as a "ferry country" at the crossroads of Western and Eastern Europe, an opportunity emerges for a shared approach with Indonesia. Drawing inspiration from the Hungarian swing policy, which seeks to engage Eastern and Western world powers, such as China, India, the United States, Germany, and France, the diplomatic cooperation between Hungary and Indonesia gains significance. Both nations can stand together on common goals within international organizations, leveraging their somewhat similar foreign policy environments. Because of this somewhat similar foreign policy environment, diplomatic cooperation between Indonesia and Hungary should be strengthened by the two countries regularly standing together for common goals in international organizations. The Russian-Ukrainian war is the most topical case in point, as Indonesia also supports a ceasefire and peace as soon as possible.⁰ Furthermore, it is crucial to emphasize that throughout its history, Hungary has never belonged to the exploitative, colonizing nations. Therefore, in collaboration with Indonesia, there is no need to overcome the burdens of the past. Hungary and Indonesia share a common understanding that negotiations should be conducted with peace, respect, and humility, reflecting a mutual commitment to these principles.

5.4. Health Cooperation

Hungary is not in a very good position either, but the Indonesian health sector has long faced significant obstacles. Amongst other things, the unequal distribution of the population often means that different religious and cultural communities need to be integrated into the same community without compromising the identity of either community.⁰ On a positive note, while in 2000 the average per capita spending on health was USD 15, 11 years later it has risen to USD 99.⁰ Furthermore, by 2014, the government had developed a new, more advanced social security system aimed at improving health services. Nevertheless, the measures taken are not sufficient, as Indonesian public spending on health is still among the lowest in the Southeast Asian region.⁰

1.1.1. Proposed solution to alleviate the difficulties of the Indonesian health sector

First and foremost, the four medical universities in Hungary (University of Pécs, University of Szeged, University of Debrecen, and Semmelweis University) and the most relevant Indonesian medical universities, such as the University of Indonesia, Andalas University,

⁰ Office of Assistant to Deputy Cabinet Secretary for State Documents & Translation. (2022). *President Jokowi Meets President Putin in Kremlin*. <https://setkab.go.id/en/president-jokowi-meets-president-putin-in-kremlin/>

⁰ Reuters. (2022). Indonesian president offers to take message from Ukraine's leader to Putin. *Reuters*, 30. June 2022. <https://www.reuters.com/world/asia-pacific/indonesian-president-visits-ukraine-peace-mission-2022-06-29/>

⁰ Kapoor, K. (2023). Indonesia proposes demilitarised zone, UN referendum for Ukraine peace plan. *Reuters*, 3. June 2023. <https://www.reuters.com/world/indonesia-proposes-demilitarised-zone-un-referendum-ukraine-peace-plan-2023-06-03/>

⁰ Szarka, E. (2016). *Egység a sokféleségben, A távoli Indonézia közelről*. Pécs: Publikon kiadó., p. 85.

⁰ World Bank (2020) *Spending for Better Results – Indonesia Public Expenditure Review*

⁰ Szarka, E. (2016). *Egység a sokféleségben, A távoli Indonézia közelről*. Pécs: Publikon kiadó., p. 87.

Gadjah Mada University, etc. As part of this, the Semmelweis- Mangoenkoesoemo scholarship program should be established, where the most talented Hungarian and Indonesian medical students can spend 1-1 year studying in another country. A mandatory criterion for the one-year opportunity would be that the selected medical student should spend at least 3 months out of 12 in a hospital in a deprived area and then write a 10-page proposal for a possible solution to the health problems there at the end of the scholarship program.

The second facet of the proposed solution involves the digitalization of Indonesia, presenting a viable pathway not only for educational challenges but also for health-related issues. Collaborative efforts between Hungarian healthcare startups like IT-Medicine⁰, specializing in women's diagnostic tools, and Indonesian innovators such as Astrid Dita⁰, working on a global cloud-based healthcare software, hold the potential to revolutionize healthcare systems in both countries. By merging technological advancements and medical expertise, this partnership could significantly contribute to addressing the pressing health concerns and fostering a more resilient healthcare infrastructure in Indonesia.

6. Conclusion

Over the nearly seven decades of diplomatic ties between Hungary and Indonesia, the relationship has consistently demonstrated a harmonious and pragmatic character. Notably, post-2010 has witnessed a significant upswing in Hungary's proactive efforts to elevate bilateral engagement to new heights. While acknowledging the apparent disparities between the two nations, I remain convinced that Hungary, within the Central-East European region, occupies a role akin to Indonesia's influence in Southeast Asia.

This evolving partnership holds promise, reflecting shared values and interests that transcend geographical distinctions. Despite the challenges posed by differences, both nations recognize the potential for collaborative endeavors that extend beyond the immediate bilateral scope. As Hungary focuses on strengthening its ties with Indonesia, a parallel commitment to regional leadership underscores the mutual aspirations for stability, growth, and influence.

Looking ahead, the hope is that the excellent rapport cultivated over the years will serve as a foundation for even deeper cooperation. Both Hungary and Indonesia, with their unique roles in their respective regions, are positioned to contribute significantly to the broader narrative of diplomatic collaborations. The ongoing commitment to excellence in the relationship between these two nations is a testament to the enduring strength and potential for further growth in the years to come.

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⁰ Mun, N. W. (2022). Tapping the cloud to power Indonesia's digital healthcare shift. *Eco-Business*, 16 March 2022. <https://www.eco-business.com/news/tapping-the-cloud-to-power-indonesias-digital-healthcare-shift/>.

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Indonesia at the Crossroads: Economic and Developmental Challenges from the Perspectives of Cyber Governance

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1. Abstract

Indonesia, the world's fourth most populous nation and a burgeoning economy, stands at a critical juncture in its development trajectory. As the country aspires to elevate its status from a developing to a developed nation, it faces multifaceted economic and developmental challenges. The 2024 presidential election, which led to Prabowo Subianto's victory is criticized to have casted a dark shadow over the future of Indonesian Democracy. With the absence of a powerful social force capable of countering oligarchic power, Indonesia's cyberspace has mainly become a new playground for elite contestation. This is hand, is intensified by the increasing number of cyberattacks which raised by 22% since 2021. Such magnitude of Indonesia's cyberspace vulnerabilities becomes a hurdle for Archipelago's economic and democratic development. This paper explores how digital policies and cybersecurity frameworks impact Indonesia's economic growth and developmental goals. The analysis begins with an overview of Indonesia's economic landscape, highlighting key sectors driving growth and areas of vulnerability. It then delves into the role of cyber governance in shaping the nation's economic policies and infrastructure. With the rapid digitization of services and the proliferation of internet users, Indonesia's cyber governance framework has become pivotal in ensuring secure and sustainable economic development. Key challenges addressed include cybersecurity threats, digital divide, regulatory inadequacies, and the need for a uniform law implementation. Additionally, this paper will also discuss on the implications of international cyber regulations and partnerships on Indonesia's domestic policies. By drawing comparisons with global best practices, it proposes strategic recommendations for enhancing Indonesia's cyber governance to bolster economic resilience and foster inclusive development. In conclusion, the paper posits that effective cyber governance is crucial for Indonesia to navigate its economic and developmental challenges. By strengthening its digital policies and cybersecurity measures, Indonesia can leverage technological innovations to achieve sustainable growth and improve the quality of life for its citizens.

2. Introduction

Indonesia, the world's fourth most populous nation and a burgeoning economy, stands at a critical juncture in its development trajectory. As the country aspires to elevate its status from a developing to a developed nation, it faces multifaceted economic and developmental challenges. The 2024 presidential election, which led to Prabowo Subianto's victory is criticized to have casted a dark shadow over the future of Indonesian Democracy. With the absence of a powerful social force capable of countering oligarchic power, Indonesia's cyberspace has mainly become a new playground for elite contestation. This is hand, is

intensified by the increasing number of cyberattacks which raised by 22% since 2021.⁰ Such magnitude of Indonesia's cyberspace vulnerabilities becomes a hurdle for Archipelago's economic and democratic development.

Cyber infrastructure is now a critical pillar of the global economy, deeply integrated across industries and national borders. The information and technology sector has seen a rapid geographical shift, with a significant portion of digital products now emerging from the Asia-Pacific region. Countries such as China, India, and the U.S. dominate the production of digital innovations, reflecting a broader shift in economic power towards the Pacific Rim. This shift has significant implications for global governance, especially in the realm of cyber governance. Historically, Europe held a dominant position in international governance structures, but the rise of these new economic powers, coupled with the evolution of the international security environment, has disrupted this balance.⁰

One of the most notable challenges this creates is the increased conflict and competition in cyberspace, where traditional norms of sovereignty and security are harder to enforce. Acts against the law using internet technology have become a separate discourse for the in transnational governance. Especially in the aspect of technology misuse that violates public spaces and privacy. The internet has successfully invited groups and individuals to act and seek profits. This then gave rise to a legal phenomenon that is often referred to as cybercrime. Cybercrime has started to be widely discussed since many cases have emerged by utilizing advances in technology and the internet, such as illegal content, cyber espionage, data forgery, cracking, unauthorized access to computer systems and services, an offense against intellectual property, cyberstalking, cybersquatting, infringements of privacy.⁰ These various modes of cybercrime can be quickly and effectively carried out through the use of technological advances themselves.⁰

The global governance structures are currently ill-equipped to address such practices, partly due to the lack of universally agreed-upon norms and regulations governing different crimes in cyberspace. The absence of clear norms leads to a dangerous ambiguity in the international cyber environment. Without a shared framework for distinguishing between economic espionage, cybercrime, and outright cyber-attacks, misunderstandings could escalate into full-scale cyber conflicts or even military confrontations. For instance, what one nation considers legitimate intelligence gathering might be interpreted by another as an act of aggression, potentially triggering retaliatory actions. This situation is compounded by the frequent use of proxies in cyber operations, further blurring the lines between state-sanctioned activities and independent criminal actions.

In terms of cyber governance, the Asia-Pacific region holds significant influence, with cyber powers such as the U.S., China, Russia, Taiwan, North and South Korea, and Australia

⁰ Estey Chen, As Cyber Threats Grow, Indonesia's Data Protection Efforts Are Falling Short <https://thediplomat.com/2022/06/as-cyber-threats-grow-indonesias-data-protection-efforts-are-falling-short/>, accessed on 11th September 2024

⁰ James Lewis, Hidden Arena: Cyber Competition and Conflict in Indo-Pacific Asia, Executive Summary, Prepared for the Lowy Institute MacArthur Asia Security Project

⁰ I Nyoman dan Wayan, "Law Implementation of Cybercrime in Indonesia Department of Business Administration", Journal of Social Sciences and Humanities, No.2, (2018): 5.

⁰ Maulia Jayantina Islami, "Tantangan Dalam Implementasi Strategi Keamanan Siber Nasional Indonesia Ditinjau Dari Penilaian Global Cybersecurity Index," Journal of Masyarakat Telematika dan Informasi, No. 8, (2017): 137

driving much of the global discourse on cyber security and governance. Interestingly, Southeast Asia does not yet have a major player in the global cyber power structure, although the region is increasingly vulnerable to cyber threats given its growing economic and digital infrastructure. Indonesia stands at the juncture of balancing between economic progress and technological development. One of the critical challenges moving forward is how to regulate cyber competition. The boundaries between cybercrime, cyber espionage, and cyber-attacks are often fluid, and existing international frameworks struggle to keep pace with the rapid evolution of technology.

Digital policies and cybersecurity frameworks impact Indonesia's economic growth and developmental goals. It is without a doubt that cyber governance plays a crucial role in shaping the Indonesia's economic policies and infrastructure. With the rapid digitization of services and the proliferation of internet users, Indonesia's cyber governance framework has become pivotal in ensuring secure and sustainable economic development. Some of the key challenges to which Indonesia faces in the context of its cyberspace governance include cybersecurity threats, digital divide, regulatory inadequacies, and the need for a uniform law implementation. Cyber governance is crucial for Indonesia to navigate its economic and developmental challenges. By strengthening its digital policies and cybersecurity measures, Indonesia can leverage technological innovations to achieve sustainable growth and improve the quality of life for its citizens.

3. The digital economy and cyber infrastructure in Indonesia

Indonesia boasts the largest digital economy in Southeast Asia. With an expanding youth population and increasing internet access, the country's digital economy has the potential to drive growth, even in the face of an impending economic slowdown. While e-commerce and fintech currently hold a dominant position, Indonesia's digital economy is gradually diversifying.⁰ The growth of Indonesia's digital economy is fuelled by rapid internet penetration and a sizable youth population that will play an even more prominent role in the future.⁰ To support this expansion, both the Indonesian government and the private sector have introduced several initiatives. These efforts focus on developing physical and digital telecommunications infrastructure, investing in start-ups and micro, small, and medium-sized enterprises, and enhancing the overall ease of doing business.⁰

Indonesia is well-positioned to emerge as a leader in the global e-commerce industry, supported by strong human resources and a promising local market. By the end of 2015, the country's e-commerce sector was valued at approximately USD 18 billion, and it is projected to reach USD 130 billion by 2020, with an annual growth rate of about 50%. This growth could make Indonesia the largest digital economy in Southeast Asia by 2020. In line with this, the government has set a goal to cultivate 1,000 new technopreneurs by 2020, with a combined business valuation of USD 10 billion.⁰ However, many emerging e-commerce

⁰ Militcyano Samuel Sapulette and Pyan A. Muchtar, Redefining Indonesia's Digital Economy, Policy Brief No.2022-06, Economic Research Institute for ASEAN and East Asia, 2023

⁰ Alisjahbana, A.S., M. Setiawan, N. Effendi, T. Santoso, and B. Hadibrata (2020), 'The Adoption of Digital Technology and Labor Demand in the Indonesian Banking Sector', International Journal of Social Economics, 47(9), pp.1109-22.

⁰ Spulette and Muchtar, Op. Cit.

⁰ Yenni Sofiana Tambunan, et. al., The Role of Students in Supporting Indonesia Become Qualified Economic Actors in the Digital Era, Jurnal Ekonomi, Vol.11, No.03, 2022

businesses and digital start-ups in Indonesia face challenges such as breach data protection and cybersecurity which are linked to the low level of digital security awareness.

Based on studies conducted on the state of cybersecurity policy in ASEAN countries, Indonesia is recognized as one of the hot spots for suspicious web activities. This is due to four main reasons. First, it is obvious that these attacks would want to target a country with a massive number of internet users, possessing billions of user data. Second, Indonesia's policy and legal framework regulating cyber security is limited and mostly overlapping. Third, the number of human resources and expertise in both public and private domains is considerably low. Last, there is a common perception of corporations to not regard cyber security as a priority.

The security awareness of internet users concerning their personal data is generally considered to be low, influenced by various factors previously discussed. Research indicates that although younger users tend to exhibit a higher level of security awareness compared to older users,⁰ there remains a subset of young individuals who are particularly vulnerable. This vulnerability often stems from a lack of knowledge on how to enhance security measures, such as utilizing privacy settings⁰ or creating strong password combinations.⁰ In Indonesia, the security awareness among smartphone users is notably low, as evidenced by the common practices of storing sensitive data on smartphones and installing unauthorized applications.⁰ Despite the existing body of research, there is a noticeable gap in studies specifically addressing the level of personal data security awareness among higher education students, who constitute the largest demographic of social media users in Indonesia.

4. Paradox of Indonesian Digital Economic Development

Indonesia's digital economy is brimming with opportunities that could significantly transform the nation's economic future. These opportunities span across e-commerce, fintech, startups, smart manufacturing, and e-governance, offering Indonesia the potential for unprecedented prosperity and innovation.⁰ E-commerce and digital payments, in particular, have become powerful drivers of change within Indonesia's economic landscape. The e-commerce sector experienced remarkable growth, with transaction volumes reaching \$53 billion in 2022, highlighting the vast potential of the industry. Beyond financial figures, this growth is

⁰ Koyuncu, M.; Pusatli, T. Security Awareness Level of Smartphone Users: An Exploratory Case Study. *Mob. Inf. Syst.* 2019, 2019,2786913

⁰ Padmavathi, D.J.; Mohanlal, S.A.K. A Study on Extent of Awareness Among College Students in Security and Privacy Issues in Social Media. *Int. J. Sci. Res. Comput. Sci. Eng. Inf. Technol.* 2021, 7, 676–682
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⁰ Alqahtani, M.A. Factors Affecting Cybersecurity Awareness among University Students. *Appl. Sci.* 2022, 12, 2589

⁰ Amin, M.; Tasmil; Herman; Bahrawi; Alam, N.; Dhahir, D.F.; Hadiyat, Y.D. Security, and privacy awareness of smartphone users in Indonesia. *J. Phys. Conf. Ser.* 2021, 1882, 012134
(1) (PDF) *Analysis of Higher Education Students' Awareness in Indonesia on Personal Data Security in Social Media*. Available from:

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⁰ Jurriens, E., & Tapsell, R. (2017). Challenges and opportunities of the digital 'revolution' in Indonesia. *Digital Indonesia: Connectivity and Divergence*, 2020, 275-288.

creating jobs and revolutionizing the way Indonesians shop.⁰ Additionally, the rise of digital payments is playing a crucial role in advancing financial inclusion, allowing a larger portion of the population, including previously underserved individuals, access to essential financial services.⁰

According to Rumata and Sastrosubroto, the regulation of digital economy is influenced by both domestic and international regulatory frameworks. Particularly in the context of e-commerce, this creates regulatory, market growth paradox.⁰ First, the paradox of regulation arises when it lacks adequate enforcement by the government or relevant stakeholders.⁰ Effective law enforcement requires more than just government action; it depends on a broader governance framework that includes various non-state actors exercising control. This governance approach calls for regulations with well-defined and focused objectives. However, creating such regulations is challenging due to the involvement of multiple parties with different interests. The primary challenge remains enforcing laws on application and content providers, particularly in establishing a level playing field between local and global electronic transaction and system providers, especially in the e-commerce sector.⁰ While local e-commerce companies must adhere to domestic regulations, these laws often do not seem to apply to global e-commerce firms. One key issue is the permanent status registration requirement.⁰

Second, the IT market paradox rises when IT investments fail to deliver the expected benefits for organizations.⁰ This paradox occurs when a company or organization allocates a substantial budget for IT implementation, but productivity does not increase as anticipated. This concept can also be applied at a national level. If a government does not balance IT investment with productivity gains, it could lead to deficits. Currently, Indonesia is one of the largest net importers of IT products. In 2017, the country's import value for telecommunications equipment reached 7.426 billion USD, doubling from the previous year⁰. China has recently become the leading exporter of telecommunications products to Indonesia, with the Ministry of Communication and Information (MCI) issuing 4,053 certificates (out of 7,308 total certificates) for imported telecommunications tools and devices from China in 2017.

⁰ Salampasis, D., & Mention, A. L. (2018). FinTech: Harnessing innovation for financial inclusion. In Handbook of Blockchain, Digital Finance, and Inclusion, Vol. 2, pp. 451-461

⁰ Adih Supriadi et.al., Economic Transformation of Indonesia in the Era of Digital 5.0: Challenges and Opportunities, International Journal of Economic Literature, Vol.1 (2), 2023, pp.122-135

⁰ Rumata, Vience & Sastrosubroto, Ashwin. (2020). The Paradox of Indonesian Digital Economy Development. 10.5772/intechopen.92140.

⁰ Haines F. The Paradox of Regulation: What Regulation Can Achieve and What It Cannot. Cheltenham: Edward Elgar Publishing Limited; 2011

⁰ Rumata VM, Sastrosubroto AS. The Indonesian E-commerce governance challenges in addressing the penetration of global user generated commerce platforms. International Conference on Computer, Control, Informatics and Its Applications: IC3INA 2017:Emerging Trends in Computational Science and Engineering. Indonesia: IEEE; 23-26 October 2017. p. 7-11. DOI:978-1-5386-3978-8/17 (1) (PDF) The Paradox of Indonesian Digital Economy Development. Available from: https://www.researchgate.net/publication/341890292_The_Paradox_of_Indonesian_Digital_Economy_Development [accessed Sep 11 2024].

⁰ Rumata, Vience & Sastrosubroto, Ashwin. (2020). The Paradox of Indonesian Digital Economy Development. 10.5772/intechopen.92140

⁰ Ward J, Peppard J. Strategic Planning for Information System. 3rded. England: John Wiley & Sons; 2002.p. 624

⁰ Rumata, Vience & Sastrosubroto, Ashwin. (2020). The Paradox of Indonesian Digital Economy Development. 10.5772/intechopen.92140

5. Conundrum of Indonesia's cyberspace governance

Cyberspace encompasses political, social, economic, cultural, and financial networks, each occupying its own space within the digital realm. The borderless and flexible nature of cyberspace demands a balanced approach to governance, avoiding both absolute freedom and authoritarian control. Regulability in cyberspace refers to the government's ability to regulate the behavior of its citizens online. Internet governance involves both the technical management of digital resources by private entities and the legal actions taken by state authorities through national laws and international agreements.

The two primary approaches of cyberspace governance include the freedom-based model and the protectionist model.⁰ If applied to the Indonesian context, Indonesia occupies a middle ground. On one hand, Indonesia acknowledges the need to adapt its laws to the rapid advancements in technology, gradually expanding opportunities for citizens to access and benefit from the internet. On the other hand, the country places a high priority on national and public interests, as reflected in its laws, such as the Information and Electronic Transaction Law, Personal Data Protection Law, Anti-Pornography Law, and cybersecurity regulations.

Although Indonesia's constitution and various regulations technically allow for free speech, this freedom is frequently limited in practice. The right to freedom of expression and other fundamental rights is protected by the Human Rights Law, which was passed shortly after the democratization process in 1998, and further strengthened by the Second Amendment to the Constitution in 2000. Despite constitutional guarantees of freedom of speech and the right to access information and communicate freely, the application of these rights is often adjusted to align with the country's ideological values. The constitution includes provisions that allow the state to limit these rights based on political, security, moral, and religious grounds, giving decision-makers wide discretion in interpreting these laws. This flexibility in interpretation raises complex questions about Indonesia's legal and philosophical foundation for cyberspace governance. Nonetheless, Indonesia has made significant progress in developing a more comprehensive, integrated, and balanced framework for cyberspace regulation.

6. Cybersecurity challenges and never-ending cyberattacks

The advancement of technology in Indonesia has led to an evident escalation in the sophistication of hackers' methods for carrying out their activities. This is evidenced by the proliferation of various types of viruses or malware that target government and educational institutions, banks, media outlets and individuals. In the past 1.5 years, Indonesia has suffered at least five major data breach incidents. These attacks did not only target government institutions, but also private sectors. From data of healthcare and social security agencies, general elections, up to the information of citizen's life insurance are sold illegally to Raid Forums. Such cases do not only portray the current condition of Indonesia's personal data protection, but also reflect the country's weak cybersecurity system. Every public and private sector is susceptible to cyberattacks and Indonesia has had a sizable experience. From e-

⁰ Al Asyari, H. (2023). Between Freedom And Protection: A Critical Review Of Indonesia's Cyberspace Law. *Prophetic Law Review*, 5(1), 79–103.

commerce of Tokopedia's data breach,⁰ general election KPU's data breach,⁰ to the most recent health sector of *peduli lindungi* data breach.⁰ It should be highlighted that banking sectors are always a desirable target for their interconnection with other sectors.

In early 2022, via the Dark Tracer account, Bank Indonesia was confirmed to have been hit by an attack from the Conti ransomware hacker. It said the hacker group was based in Russia under the pseudonym Wizard Spider and used phishing attacks to install Trojan Trickbot and BazarLoader with the aim of gaining remote access. In the same month, a ransomware attack occurred in the Ministry of Finance's Directorate General of Taxes (DJP Ministry of Finance) system. This was traced through a taxpayer accessing DGT's website which had been hit by a malware virus before. Still in the same year, November 2022 a ransomware attack targeted Air Asia airlines with confirmation of the leak of 5 million passenger and employee data by the hacker group Daixin Team

Indonesia does not have a specific cybersecurity law to date. The existing legal basis still refers to the ITE and PDP law, which is sufficient to address cyber-related and data protection offenses but falls short in addressing the protection of information infrastructure or the need for human capital in the field of cybersecurity.⁰ Nonetheless, as one of the first cases after the enactment of PDP Law, the BSI ransomware attack could be an opportunity for the PDP Act to show its teeth and enforce the provisions of personal data protection law in Indonesia. The criminal and administrative sanctions set under the PDP law are enforceable towards individual persons and corporations who are found to have committed data protection offenses. Notwithstanding the existing legal framework, Indonesia still urgently requires a specific law to address cybersecurity along with a national strategic plan that sets out priorities in protecting the national cyber infrastructure. The reliance on the cybersecurity system is highly important to protecting Indonesia from cyber-attacks. It is crucial for the Government and other stakeholders to establish a shared understanding in cybersecurity management. A solid legal framework must be sought to enable coordinated responses and heighten awareness regarding potential threats.

7. Indonesia at the crossroad: balancing economic innovation and robust cyber governance

In order for Indonesia to realize the full potential of its digital economy, there are two major aspects that the government needs to prioritize. First, in terms of connectivity. Despite Indonesia's high internet penetration rate, it only ranks 57th out of 100 countries in the Economist Intelligence Unit's Internet index based on its combined scores on internet availability, affordability, relevance, and readiness.⁰ The issue of connectivity is especially severe in many underprivileged communities located in the remote areas of the archipelago, where approximately 12,500 villages still lack consistent internet access. Estimates indicate

⁰ <https://www.thejakartapost.com/news/2020/05/04/tokopedia-data-breach-exposes-vulnerability-of-personal-data.html>

⁰ <https://www.thejakartapost.com/news/2020/05/22/calls-mount-for-comprehensive-audit-into-data-breach-affecting-2-3-million-voters.html>

⁰ <https://www.thejakartapost.com/paper/2022/11/22/care-and-protect-apparent-govt-health-app-breach-raises-deeper-data-concerns.html>

⁰ https://digitalsociety.id/2021/07/28/analyzing-indonesias-national-cybersecurity-strategy/#_edn8

⁰ The Inclusive Internet Index 2020, the Economist Intelligence Unit, in Deloitte Indonesia Perspective, Second Edition 2021

that only about 43% of businesses in these villages are able to sell their products online, compared to 57% in urban areas. This disparity is largely due to the unreliability of telecommunications networks, including weak cellular signals and unstable internet connections, which remain significant obstacles for MSMEs attempting to fully capitalize on the expanding online platforms and the broader markets they provide. Second, the problem of human capital. One of the main factors of MSMEs' failures in digital economy is the technological gap. MSMEs. Inability to possess the know-how of using digital platforms, disables them from embracing the digital potential such as analysing market needs and running an online business. Based on the data, only about 15% of MSMEs, who ventured online have managed to successfully conduct their operations.⁰

Ensuring the protection of citizens and businesses against cyber threats requires a robust cybersecurity framework. To strengthen the legal basis for cybersecurity, Indonesia can expand on already-existing legislation like the Personal Data Protection Law and the Law on Information and Electronic Transactions. Regulations that guarantee safe online transactions without impeding technical advancement are crucial. The borderless nature and flexibility of cyberspace requires a balance in its governance, that neither prevails absolute freedom nor authoritarian restraints. The regulability of cyberspace refers to the ability of a government to regulate the behaviour of its citizens on the internet. Internet governance includes issues directly related to the technical administration of electronic resources, including private entities, as well as any and all actions performed by state authorities using legal instruments and international organizations exerting a direct impact on activities performed using the electronic medium, including those outside a regulating state.

Furthermore, Indonesia needs to find a middle ground between promoting economic innovation and making sure regulations are appropriate. The establishment of "regulatory sandboxes" by the government permits start-ups to test innovative technology under close oversight. In this manner, companies can innovate while the government keeps an eye out for possible threats and guarantees that cybersecurity regulations are followed.

Additionally, as suggested by Ira and Alifah, Co-regulation is necessary in order to properly regulate various sectors of the digital economy. Co-regulation is a regulatory strategy that prioritises the sharing of accountability between state and non-state actors, including large-scale private sector participants in the formulation and implementation of policies. It focusses on working together to create, adopt, implement, and update rules and regulations. It may give the state the information and understanding it needs to regulate the digital economy, act as a forum for discussion and adaptable legislative solutions to the rapidly evolving and novel digital economy, and make regulatory enforcement easier.⁰

8. Conclusion

Cyberspace promotes equality and inclusivity, as seen in the threshold upheld by United Nations, as well as with the characteristics cyberspace itself which helps by providing access towards information for every of its users. The notion of equality and inclusivity in cyberspace, however, will of course result in perpetrators who violate such rights, thus

⁰ Deloitte Indonesia Perspective, Second Edition 2021

⁰ Aprilianti, Ira; Dina, Siti Alifah (2021) : Co-regulating the Indonesian Digital Economy, Policy Paper, No. 30, Center for Indonesian Policy Studies (CIPS), Jakarta

committing cybercrimes. Cybercrimes vary from hacking, spreading hate, and misusing personal information to distributing child pornography, grooming and terrorism. Penalties for cybercrimes are also similar in many countries such as large amount of fine, imprisonment for years depending on the severity of the cybercrime, and also the obligation to provide restitution for the victims in some countries the United States, and reparation like in Europe.

In terms of cybersecurity, Indonesia needs to urgently follow up on the draft Bill on Cybersecurity and Resilience to which it must involve public participation. The bill must provide an overview of Indonesia's long term cyber strategy and having consistency between the principles, aims, scope, and applicability. The National cybersecurity strategy must also include legal remedies, technical efforts conveying standards and operations, organizational and institutional structuring of cybersecurity subscribes, capacity building, human resource, and international cooperation. Such strategy must also consider the most relevant threats that Indonesia have been facing as its priority.

With the rapid digitization of services and the proliferation of internet users, Indonesia's cyber governance framework has become pivotal in ensuring secure and sustainable economic development. Key challenges addressed include cybersecurity threats, digital divide, regulatory inadequacies, and the need for a uniform law implementation. Additionally, this will also affect the implementation of international cyber regulations and partnerships on Indonesia's domestic policies. By drawing comparisons with global best practices, we propose strategic recommendations for enhancing Indonesia's cyber governance to bolster economic resilience and foster inclusive development. In conclusion, we suggest that effective cyber governance is crucial for Indonesia to navigate its economic and developmental challenges. By strengthening its digital policies and cybersecurity measures, Indonesia can leverage technological innovations to achieve sustainable growth and improve the quality of life for its citizens.

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New Opportunities for Indonesian-Hungarian Economic Relations

Márk Horváth

1. Abstract

This paper aims to propose project ideas for further strengthening economic cooperation between Indonesia and Hungary. It emphasizes the potential for technology transfer between the two countries and focuses on proposing a new project in the field of biomass energy. The proposed biomass energy project aims to leverage Hungary's expertise in the bioenergy sector to aid Indonesia in developing its energy infrastructure. By leveraging modern technologies and advancements in biomass energy, the project aims to contribute to Indonesia's efforts in achieving its climate and energy goals. The document stresses the economic and environmental benefits of this proposed collaboration and the potential for mutual growth and development between Indonesia and Hungary. Furthermore, the paper proposes a possible cooperation of developing a digital health tool for the Indonesian healthcare system. Creating a centralized database can facilitate the work of the Indonesian health sector nationwide. Finally, technology transfer and cultural cooperation can also help Indonesia to adopt the latest technologies in precision agriculture.

2. Introduction: Economic relations

The goal of this document is to create project proposals for economic cooperations between Indonesia and Hungary. In order to find the most valuable fields of interest, I find it worthwhile to summarize the already existing economic relations between our countries, highlighting the successes of the Eastern Opening policy of Hungary, thus working as a paved road to show what has worked so far.

Indonesia's dynamic economic development over nearly a decade, its huge domestic market of 270 million people and its international trade role in Southeast Asia make it a key economic partner for Hungary in the region. Technology transfer has already been a key element of our external economic relations with Indonesia. Hungarian companies have achieved significant successes in the fields of ICT technologies, water management technology (Budapest Waterworks KSH project) and agrotech (isotope food gamma irradiator in Yogyakarta, Central Java)⁰.

Thanks to the aid loan agreement signed in December 2013, we can already see the fruits of our endeavor, which allowed Budapest Waterworks to implement a USD 36.4 million investment to supply water to 36 Indonesian municipalities and hundreds of thousands of inhabitants with small-capacity mobile water treatment plants. The project ended in 2019 with outstanding success. To ensure further influx of ideas and possibilities, a large-scale virtual

⁰ Magyarország jakartai nagykövetsége. (2023). *Gazdasági kapcsolatok - Indonézia*. <https://jakarta.mfa.gov.hu/page/gazdasagi-kapcsolatok-indonezia>

business forum #HUNINDOTECH 2.0, was held in November 2020. It focused on showcasing competitive Hungarian technologies and innovations and Hungarian companies interested in the Indonesian relationship⁰.

As another important milestone in our bilateral economic relations, on 27 January 2021, the Toll Regulatory Agency (BPJT) of the Indonesian Ministry of Public Utilities and Housing officially announced that the tender for the implementation of the cash and contactless Multi Lane Free Flow (MLFF) based electronic toll payment system on Indonesian highways had been awarded to Roatex Zrt. The system will involve an investment of more than USD 300 million. The construction of the new electronic toll network, which will cover the entire territory of the world's fourth most populous country, is one of the largest Hungarian technology exports ever⁰.

On 16 February 2021, Minister of Foreign Affairs and Trade Péter Szijjártó and Indonesian Foreign Minister Retno Marsudi signed the Memorandum of Understanding on the establishment of the Indonesia-Hungary Investment Fund (IHIF). The IHIF will support the implementation of infrastructure development projects in Indonesia with Hungarian participation⁰.

In my proposal, I would like to contribute core ideas to the successful projects mentioned above, focusing on technology transfer between our countries.

3. Project 1: Biomass energy

3.1. Executive Summary

Energy made from biomass either planned for this purpose or waste used as fuel is a great help for many countries in transitioning into being more sustainable, conscious, and independent in their energy sector. The Indonesian Bioenergy sector is currently heavily underutilized, characterized by outdated technologies and underdeveloped infrastructure. The representatives of the Hungarian Bioenergy sector could be of great aid for Indonesia in developing their energy sector in this particular field.

3.2. Project Background

As many other countries nowadays, Indonesia faces the challenge of the ever-increasing energy consumption as well. According to the latest data, around 95% of people have access to electricity in the country, so most of the increase comes from the quality of life and rising consumption. According to the Indonesia Green Growth Program, Indonesia is on its way to green and renewable energy sources. “The target proportion of emission reduction from the energy sector is 11%, while also aiming for 23% energy coming from new and renewable energy by 2025⁰.”

To achieve its goals, I would like to recommend a nowadays underutilized and promising way to achieve these climate goals while remaining economically feasible. Biogas is already used

⁰ Magyarország jakartai nagykövetsége. (2023). *Gazdasági kapcsolatok - Indonézia*. <https://jakarta.mfa.gov.hu/page/gazdasagi-kapcsolatok-indonezia>

⁰ Magyarország jakartai nagykövetsége. (2023). *Gazdasági kapcsolatok - Indonézia*. <https://jakarta.mfa.gov.hu/page/gazdasagi-kapcsolatok-indonezia>

⁰ Magyarország jakartai nagykövetsége. (2023). *Gazdasági kapcsolatok - Indonézia*. <https://jakarta.mfa.gov.hu/page/gazdasagi-kapcsolatok-indonezia>

⁰ Rianawati, E., et al. (2021). The potential of Biogas in Energy Transition in Indonesia, *IOP Conferece Series: Materials Science and Engineering*, 1143(1), 1-9

in Indonesia but the technological level and the energy level coming from the quality of gas still has a lot of potential to grow. Most biogas plants are disseminated in rural areas, the biogas produced is focused to be used directly for household purposes like water heating, cooking. A higher level of effectiveness can be achieved with better technologies, thus encouraging a transition into electrical utilization⁰.

From using oil-palm shell waste from crude palm oil factories, coconut shell waste from coconut plantations, as well as skimmed coconut oil and straw from rice cultivation, Indonesia, one of the world's largest producers of agricultural products, has huge potential of using biomass for electricity⁰.

3.3. Solution

There are plenty of ways to utilize biomass. It can be directly burned, as it usually is in Indonesia, but this contributes to Indonesia being heavily polluted by aerosols and smog in terms of air quality⁰. But also, it can be deconstructed through anaerobic ways to produce biogas, which is less destructive on the environment, enables the storage of energy as gas contrary to pure electricity, which is hard to store, and can be burned in a much cleaner way than biomass itself.

Biogas is a renewable source of energy, produced by the decomposition of organic matter under oxygen-free conditions, with the help of microbes. Its main feedstocks are animal manure, crop and slaughterhouse waste, energy crops, sewage sludge, and municipal organic waste, all of which are in abundance in a newly industrialized country such as Indonesia. From all of these, heat and electricity are produced, mostly in combined heat and power plants of different sizes and capacities, using a variety of microbial fermentation technologies. The main constituents of biogas are methane and carbon dioxide, but it also contains traces of nitrogen, hydrogen, hydrogen sulfide and ammonia, which can be used not only in other fields of industry but as an enriching, recycled product mixed with other biomass sources to achieve higher levels of energy rich gas⁰.

By purifying the biogas and separating the CO₂ content, biomethane is obtained, which is chemically, and calorific value is no different from the methane in fossil natural gas and can therefore be used as a partial substitute for natural gas for all the purposes for which we use fossil natural gas today. The biomass residue left over after fermentation can be composted, primarily for nutrient replenishment in topsoil, but also used to produce crop-specific functional soils in line with recent agricultural trends. This compost can be used to replace fertilizers produced in chemical plants using energy-intensive technologies⁰.

⁰ Rianawati, E., *et al.* (2021). The potential of Biogas in Energy Transition in Indonesia, *IOP Conferece Series: Materials Science and Engineering*, 1143(1), 1-9

⁰ statista.com (2023). *Bioenergy capacity in Indonesia from 2012 to 2021*. <https://www.statista.com/statistics/1019423/indonesia-bioenergy-capacity/>

⁰ Hardhi, M. (2022). "Biomass Energy," in *Indonesia Post-Pandemic Outlook: Strategy towards Net-Zero Emissions by 2060 from the Renewables and Carbon-Neutral Energy Perspectives*, Penerbit BRIN

⁰ Engling, G., He, J., Betha, R., & Balasubramanian, R. (2014). Assessing the regional impact of Indonesian biomass burning emissions based on organic molecular tracers and chemical mass balance modeling, *Atmos Chem Phys*, 14(15), 8043-8054

⁰ Toldi, O. & Bera, P. (2022). A biogáz-termelés helyzete és jövője Magyarországon – szakpolitikai elemzés, *Klímapolitikai Intézet* <https://klimapolitikaiintezet.hu/elemzes/biogaz-termeles-magyarorszag-szakpolitikai-elemzes>

⁰ Toldi, O. & Bera, P. (2022). A biogáz-termelés helyzete és jövője Magyarországon – szakpolitikai elemzés, *Klímapolitikai Intézet* <https://klimapolitikaiintezet.hu/elemzes/biogaz-termeles-magyarorszag-szakpolitikai-elemzes>

Small scale electricity production from biomass doesn't seem to be an economically feasible solution according to research⁰. Neither the technology, nor the infrastructure generally enable it to be competitive. At present, the application of gasifier technology for small-scale electricity production in the framework of international development co-operation seems to be justifiable only in very few cases⁰, thus more robust, medium to large sized bioenergy plants are needed.

Most low- and middle-income households in rural areas have a greater need for clean and affordable energy. The upfront cost of biogas plant installation is a significant impediment to the adoption of rural biogas plants among these households⁰. To enable the adoption of biogas technology for the development of an efficient energy source in target areas, Hungarian technology and policy lessons could be of great help.

3.4. Additional information

Using palm oil as a biomass energy source might seem like a convenient solution at first glance, but its widespread use comes with significant drawbacks that outweigh its benefits. After multiple discussions with representatives from Indonesia and university students, the following concerns have emerged:

The first concern is the environmental impact. The production of palm oil often involves large-scale deforestation, particularly in regions like Southeast Asia. Clearing forests for palm oil plantations leads to the destruction of vital ecosystems, loss of biodiversity, and contributes to climate change by releasing significant amounts of stored carbon dioxide.

The second one is habitat destruction as palm oil plantations encroach upon the habitats of endangered species like orangutans, tigers, and elephants, leading to habitat loss and endangerment of these species. This disruption of ecosystems can have cascading effects on the entire environment.

The third one contains land use conflicts. Land used for palm oil plantations often competes with land needed for food production. This can exacerbate food insecurity and raise concerns about ethical land use practices, especially in countries such as Indonesia where resources like landmass are already getting scarcer.

The fourth concern is social impact as palm oil production has been associated with various social issues, including land grabbing, labor abuses, and conflicts with indigenous communities. Workers in palm oil plantations often face poor working conditions and low wages. Until the needs of workers and safety concerns are not met, support from the public for the establishment of additional palm oil plantations is going to be hindered.

Finally, health concerns themselves have emerged due to the technologies currently in use. Burning palm oil for energy generation can release pollutants into the air, contributing to air quality issues and posing health risks to nearby communities. Air pollution in Indonesia is already an increasing problem as industrialization is faster than the technologies implemented towards cleaner waste products.

⁰ Situmeang, R., Mazancová, J. & Roubík, H. (2022) Technological, Economic, Social and Environmental Barriers to Adoption of Small-Scale Biogas Plants: Case of Indonesia, *Energies*, 15(14), 5105-5121

⁰ Dimpl, E. (2011) Small-scale Electricity Generation from Biomass, *Eschborn*. https://energypedia.info/images/9/93/Small-scale_Electricity_Generation_From_Biomass_Part-1.pdf

⁰ Dimpl, E. (2011) Small-scale Electricity Generation from Biomass, *Eschborn*. https://energypedia.info/images/9/93/Small-scale_Electricity_Generation_From_Biomass_Part-1.pdf

Instead of relying on palm oil as a biomass energy source, investing in alternative sustainable biomass sources or renewable energy technologies like solar. This option has less detrimental impacts on the environment, offers better long-term sustainability, and can contribute to reducing greenhouse gas emissions without compromising biodiversity or exacerbating social issues. Biomass reworked could be a potential energy source as well, but only through the use of waste such as unused parts of palm trees.

Deliverables and Goals

The Hungarian agricultural sector is on a great technological level characterized by continuous innovations on the field of biotechnology⁰. A great example is “NRG-AGENT Kft.” which provides combined energy and heat producing technology and facilities and its subsidiary company “ZÖLD NRG-AGENT Kft.” which focuses on gas produced from landfills.

Required Resources

- Research should be conducted by industry experts on the difference of biomass to bioenergy ratio between Hungary and Indonesia.
- Deliverable technologies and plans should be adjusted to Indonesian policies.

Conclusion

Taking into consideration the Indonesian policies, Hungary could deliver new technologies to Indonesia, enabling a greater level of energy production combined with being environmentally friendly and renewable.

4. Project 2: Digital Health

4.1. Executive Summary

Aiding transition into digital health and assessing local challenges. I wish to present the possibility of a fruitful cooperation between Indonesia and Hungary in developing a Digital Health tool for Indonesia. In the digital age, continuous data integration is an essential component for digital transformation, in which Hungarian expertise could be of a great help to Indonesia in achieving a sustainable transition into a centralized system.

4.2. Project Background

In terms of healthcare, Indonesia is in a rather particular situation. The country is made up of thousands of small, scattered islands beside the major ones, such as Java, Kalimantan, Papua, Sumatra and so on. This complicates several things like trade, electricity access and a standardized healthcare system as well⁰.

Indonesia is currently undergoing an epidemiological transition, with the disease burden shifting from communicable disease and early life mortality to non-communicable diseases. This came with an increased life expectancy and increases in median age at death but with the cost of NCD death cases being harder to cure and prevent⁰.

⁰ Magyar Biotechnológiai Szövetség. (2017). *Tagjaink*. http://hungarianbiotech.org/?page_id=205&lang=hu

⁰ Ministry of Health of the Republic of Indonesia (2021). *Blueprint for Digital Health Transformation Strategy 2024*, Jakarta. Ministry of Health of the Republic of Indonesia.

⁰ Bloom, D. E, *et al.* (2015) Economics of Non-Communicable Diseases in Indonesia, *World Economic Forum*

The health sector is currently characterized by inadequate regulations on data protection, standardization, patient rights, and privacy. In an investigation conducted by the “Ministry of Health of the Republic of Indonesia”, more than 400 health applications have been mapped with an estimate of even more unknown at local levels. This phenomenon is thanks to the booming innovation wave caused by the COVID-19 pandemic and could lead to an always growing market in the upcoming years^{0,0}.

Meanwhile, the medical records of a population of approximately 270 million are still in paper form, prescriptions and claims are handled on paper and hundreds of health applications rely on individual information as well. All this scattered data cannot be accessed by health workers easily, continuously and in real time, which leads to inadequate health support. The absence of a monitoring system on the readiness of health facilities, laboratory networks, human resources and medical equipment makes it harder to distribute the resources as needed as well⁰.

The will to transition is clear. President of the Republic of Indonesia, Joko Widodo, said that integrated data and a simpler healthcare system are aspects that need to be continuously improved to achieve a Healthy Indonesia⁰.

4.3. Solution

Some successes have already contributed to digitalized healthcare information management through immunization campaigns⁰ and in the handling of COVID 19 in Indonesia⁰ but there is much left to do.

A centralized database is needed not only for patients but for service providers as well. Hungary started its path into healthcare data digitalization well before the COVID-19 pandemic and made much of its data into the system “EESZT” during it with success⁰. The EESZT, operated by the State Health Care Supply Centre of Hungary, is a cloud-based communication platform that connects public and private health care providers - hospital, outpatient, and general practitioner services - pharmacies and the general public throughout

⁰ Ministry of Health of the Republic of Indonesia (2021). *Blueprint for Digital Health Transformation Strategy 2024*, Jakarta. Ministry of Health of the Republic of Indonesia.

⁰ Transform Health Indonesia. (2024). *Transform Health Indonesia*. <https://transformhealthcoalition.org/indonesia/>

⁰ statista.com (2023). *Bioenergy capacity in Indonesia from 2012 to 2021*. <https://www.statista.com/statistics/1019423/indonesia-bioenergy-capacity/>

⁰ Ministry of Health of the Republic of Indonesia (2021). *Blueprint for Digital Health Transformation Strategy 2024*, Jakarta. Ministry of Health of the Republic of Indonesia.

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⁰ Jusril, H. *et al.* (2020). Digital health for real-time monitoring of a national immunisation campaign in Indonesia: a large-scale effectiveness evaluation. *BMJ Open*, 10(12), 1-9

⁰ ‘Ainur Rohmah, A., Rachmawati, R. & Mei, E. T. W. (2023). Smart City Achievement through Implementation of Digital Health Services in Handling COVID-19 Indonesia. *Smart Cities*, 6(1), 639–651

⁰ Magyarország Kormánya (2020). *Sikeressé vált az egészségügyi felhő költöztetése*. <https://2015-2019.kormany.hu/hu/emberi-eroforrasok-miniszteriuma/egeszsegugyert-felelos-allamtitkarsag/hirek/sikeress-volt-az-egeszsegugyi-felho-koltoztetese>

Hungary. Patient data shared in this way facilitated faster, more accurate diagnosis and better targeted therapy^{0 0}.

Deliverables and Goals

Based on its past experiences and successful transition into digital health, Hungary could be a prime candidate for aiding the Indonesian government in the creation of its own digital health systems. By aiding them through a technology transfer and delivering an already functioning template, we stand as a great opportunity for them.

Required Resources

- A branch of experts made from the creators and staff of EESZT, with the sole purpose of working with the Indonesian authorities in order to help them create a functional Digital Health Platform.

Conclusion

A technology transfer on a similarly huge scale is already on its way, with the creation of the digital Multi Lane Free Flow system handling highway tolls. Using our past successes, we could leverage them as a stepping stone into the booming digital health market in Indonesia, cooperating with local authorities and establishing closer relations.

5. Project 3: Precision Agriculture and Biotechnology for addressing local challenges.

5.1. Executive Summary

Indonesian agriculture is pivotal not only for the economy of the country, but also for putting food onto the plates of Indonesian families. This sector is currently under a lot of pressure coming from multiple sides at the same time. Increasing demand and decreasing land combined with decreasing farmer numbers pose a great threat which can only be effectively addressed in the long term by implementing the latest technologies created through informatics and biotechnology. Hungarian examples and cooperative channels could aid Indonesia greatly, while Hungary could benefit in the long term from the collaboration of our scientific communities as well.

5.2. Project Background

The development of agriculture can be characterized by three eras. The first, pre-industrial era of agriculture lasted from the beginning of crop cultivation until the agricultural economy was dominated by the industrialization of the land. The second phase, industrial agriculture, started in the 19th century and turned into tractors, combining harvesters, fertilizers and hybrid seeds which enabled the emergence of large-scale commercial farms. The productivity of these developments meant that as little as half a hectare was enough to feed five people. The third phase is taking place today and could be the solution for the following problems⁰.

⁰ Magyarország Kormánya (2020). *Sikeres volt az egészségügyi felhő költöztetése*. <https://2015-2019.kormany.hu/hu/emberi-eroforrasok-miniszteriuma/egeszsegugyert-felelos-allamtitkarsag/hirek/sikeres-volt-az-egeszsegugyi-felho-koltoztetese>

⁰ Kónya, R. (2022). Digital health is not the future, but the present in Hungary. *Semmelweis Egyetem*, 24. October, [semmelweis.hu/english/2022/10/digital-health-is-not-the-future-but-the-present-in-hungary/](https://www.semmelweis.hu/english/2022/10/digital-health-is-not-the-future-but-the-present-in-hungary/)

Food security is a major concern in numerous countries, including Indonesia. Indonesia's agricultural heritage is deeply intertwined with its rich history and cultural diversity. For centuries, agriculture has been the backbone of Indonesian society, with rice as the predominant crop. Today, land productivity is continuously decreasing due to shrinking arable agricultural land, global warming, and land degradation. All the while, the increase in the

population of Indonesia⁰ combined with the higher and higher consumption rate creates an always growing demand for food. Countries and their farmers need to continuously look for

ways to increase their production, all the while considering their effect on the environment.

This includes waste management, pesticide usage, crop selection etc⁰.

To keep up with the increasing need for food and decreasing land size, Indonesia needs to

explore the latest trends in agriculture.⁰

5.3. Additional information

After consultations took place during the study trip in Indonesia, I have managed to expand on and add multiple key aspects of precision agriculture. Precision agriculture offers a range of tools and strategies that can greatly improve Indonesia's agricultural landscape, while also enhancing food security for the entire ASEAN region. By harnessing technologies such as GPS, sensors and data analytics, precision agriculture is revolutionizing agricultural practices, and optimizing resource use in Indonesia's diverse climate. This approach allows farmers to fine-tune inputs such as water, fertilizer and pesticides according to soil conditions and the needs of the crops they grow. By monitoring crop health, soil moisture and nutrient levels in real time, farmers can intervene precisely when needed, increasing yields and overall productivity. This increase in production plays a key role in meeting growing food demand, not only in Indonesia but also in neighboring ASEAN countries. It is in line with sustainable farming practices by reducing the overuse of chemicals and water. It helps to preserve the agricultural ecosystem, reduce soil erosion and reduce pollution, thus protecting the environment for future generations.

The introduction of precision agriculture also involves educating and training farmers in the latest techniques and technologies. This knowledge will enable them to make informed decisions, adapt to changing climate patterns and improve their livelihoods, contributing to the wider agricultural development of the region. Many of the technologies are already in use or farmers have the opportunity, what they lack is the finely tuned analyzation skills, which can only be provided through the education of people. This creates opportunities for international cooperations with other universities, student and fellow researcher exchanges for a continuous flow of expertise. This not only promises to improve agricultural productivity, but also offers opportunities for economic growth. It can create more jobs in the agricultural sector and stimulate innovation in the agro-tech industries, catalyzing economic development in these sectors.

As climate change affects agricultural patterns, precision agriculture is emerging as a resilient solution. This data-driven approach allows for rapid response to changing weather conditions, enabling farmers to mitigate risks and maintain consistent yields despite unpredictable climate variability. As a major player in the ASEAN community, Indonesia plays a key role in regional food security. By introducing precision agriculture, Indonesia can increase its agricultural production and thus become a more reliable supplier in the region. This would significantly strengthen stability and food security in neighboring ASEAN countries.

Precision agriculture is essentially poised to revolutionize Indonesia's agricultural landscape and offer a pathway to sustainable, efficient, and resilient agriculture. Its widespread adoption can enhance food security not only in Indonesia, but also in the entire ASEAN region, contributing to environmental conservation, economic growth, and stability.

5.4. Solution

The solution is precision agriculture and advanced biotechnology. Precision agriculture is characterized by a large amount of data collected through satellite systems and sensors on machines and plants. The large amount of data and the "Internet of Things" allow the analysis of many sources of information through various intelligent software, thus enabling farmers to base their decisions on scientific and precise data. This enables for minimal intervention and maximum yield.

Hungary has achieved significant results thanks to the implementation of precision agriculture and is continuously developing new systems and technologies to make its agriculture more competitive. Being a historical agricultural land, characterized by a good quality of soil, Hungary's history and culture is deeply rooted into its agriculture just as Indonesia. Systems

such as the “Precíziós Gazdálkodási Rendszer”⁰ make it possible for farmers to use the latest technologies containing a broad field of applications such as agrotechnology, technical and informatics solutions. Transferring the expertise into the fields of Indonesia would be beneficial for both sides. These relations could be further emphasized through joint research, competitions for university students and cultural exchange.

Our other possibility is biotechnology. Biotechnology enables us to modify crops either through genetic engineering or selective breeding. The former is characterized by actively making changes in the genetic code of plants and is heavily reliant on advanced genome

modification technologies such as CRISPR⁰. The latter is a more traditional way of shaping plants to our needs and humanity has been doing it since the dawn of civilization. Selective breeding is when we only replant the crops, we deem the best suited for our needs. One being more resistant to drought and pests, or one bringing the most plentiful yield. This selection process is safer but slower. Still, it can be accelerated to a faster pace than ever thanks to the genomes of plants being accessible for scientists and conducting selective breeding based on genes, not just hope and observation.

Hungary has a long history of research in the natural sciences with Nobel prize winning scientists such as Dr. Szent-Györgyi Albert being the first to synthesize Vitamin C while conducting research on the plant pepper. Standing on this legacy, Hungarian scientists have been relentlessly working on the field of Biology with such goals, which is greatly

represented by the Gabonakutató Nonprofit Közhasznú Kft. in Szeged⁰. Involving students from the University of Szeged as well, they work on creating crops such as wheat, corn, sunflower and soybean to be best suited for the characteristics of the land and climate.

Deliverables and Goals

Through technology transfer Hungary could be of service for Indonesia in making its agriculture more competitive while addressing the uncertainties of climate change. Linking universities could be of great service in the flow of not only the technologies but also the scientists who possess them. This cultural exchange leads to more opportunities for economic cooperations and Hungarian businesses that already have the means to transition into an evidence based, biotechnologically advanced and through informatics connected precision agriculture.

Required Resources

- Establishment of connections between already existing laboratories in Indonesia working on the field of crop development and Hungarian universities.
- Mapping the most viable agricultural partners in Indonesia having the will and the funds for making their businesses more productive.

Conclusion

We already possess many of the tools to address the challenges in the field of agriculture posed by climate trends that have a similar effect on the whole world, decreasing crop yields. Why let a newly industrialized country go on the long, tedious way on its own through the same mistakes if, through cooperation we could achieve the same or even greater results much faster.

Many Hungarian businesses which are based on research and new technologies are not even aware of the possibilities because of the uncertainty and distances. These could be highly elevated through joint research and cooperation between Hungary and Indonesia where the businesses are connected by common curiosity and lead to profitable endeavors.

6. Conclusion

Hungary is always looking for new possibilities to develop its economic and cultural relations with Indonesia. This short paper's goal was to present some of the viable possibilities worth looking into, but there are many more undiscovered yet. Whole sectors are waiting for demands to be met, connections to be established and joint development to happen. The "eastern opening" was a great success setting our foot in Southeast Asia, but the "eastern expansion" is still waiting to happen. I hope this paper will aid it in any way possible.

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Cultivating Opportunities: Hungary's Agricultural Investment in Indonesia

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1. Abstract

The study trip to Indonesia aims to explore the potential collaboration between Hungary and Indonesia in the field of agriculture. This partnership seeks to leverage Hungary's advanced agricultural expertise to address the challenges faced by Indonesia's agricultural sector. Through the analysis of Indonesian agriculture, the research paper highlights the pivotal role of the sector in the country's economy and cultural identity. Key challenges such as sustainability, urbanization, and unsustainable farming practices are identified, emphasizing the urgency of implementing modernization and sustainable agricultural initiatives. The essay also outlines various investment opportunities in Indonesia, including technology transfer, sustainable practices, crop diversification, and infrastructure development, presenting a compelling narrative of economic cooperation. Furthermore, strategies for effective collaboration between Hungary and Indonesia, such as public-private partnerships, research and development initiatives, and sustainable supply chain development, are proposed. The study underscores the importance of education and the potential of regenerative rainforests in driving mutual growth and development between the two nations.

2. Introduction

In an ever-evolving world driven by globalization and cross-border collaborations, nations are constantly seeking new avenues to fortify economic ties and unlock opportunities for mutual advancement. One such promising partnership resides at the intersection of Hungary and Indonesia, where the agricultural landscapes of these two nations converge, presenting a fertile ground for economic cooperation and growth.

⁰ Erdeiné Késmárki-Gally, S. (2020). A precíziós gazdálkodás jelentősége a mezőgazdaság versenyképességében. *Multidiszciplináris kihívások, sokszínű válaszok - Gazdálkodás- és Szervezéstudományi folyóirat*, 3(2), 43-58.

⁰ Macrotrends (2023). *Indonesia Population 1950-2023*. https://www.macrotrends.net/global-metrics/countries/IDN/indonesia/population#google_vignette

⁰ Herdiansyah, H., Antriyandarti, E., Rosyada, A., Arista, N. I. D., Soesilo, T. E. B. & Ernawati, N. (2023). Evaluation of Conventional and Mechanization Methods towards Precision Agriculture in Indonesia. *Sustainability*, 15(12), 9592-9613

⁰ Macrotrends (2023). *Indonesia Population 1950-2023*. https://www.macrotrends.net/global-metrics/countries/IDN/indonesia/population#google_vignette

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⁰ Chen, K. & Gao, C. (2014). Targeted genome modification technologies and their applications in crop improvements, *Plant Cell Rep*, 33(4), 575–583

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Hungary is renowned for its centuries-old agricultural heritage and cutting-edge advancements in modern farming practices. With fertile plains, rich soils, and a robust agri-tech sector, Hungary has emerged as a powerhouse in the European agricultural landscape. Its commitment to sustainability, innovation, and food security has garnered global recognition. On the other side of the globe lies Indonesia, an archipelagic nation graced with unparalleled natural beauty and abundant agricultural potential. Indonesia's agricultural sector serves as the backbone of its economy, providing livelihoods to millions and contributing significantly to its GDP. However, it faces multifaceted challenges, including the need for modernization, sustainable practices, and increased productivity.

The convergence of Hungary's agricultural excellence with Indonesia's agricultural aspirations offers a compelling narrative of opportunity and collaboration. This essay intends to show how Hungary's agricultural prowess can be harnessed to invest in and foster cooperative initiatives within Indonesia's vibrant agricultural sector. It will navigate the prospects, challenges, and strategies that underpin the economic cooperation between these two nations, with a particular focus on agriculture as the linchpin of this transformative journey. It will uncover the myriad investment opportunities that exist within Indonesian agriculture, ranging from technology transfer and sustainable practices to crop diversification, food processing, and infrastructure development. Additionally, elucidating the strategies through which Hungary and Indonesia can collaborate effectively, forging public-private partnerships, investing in research and development, and promoting sustainable supply chains. In the end, this essay aims to answer the question of 'What opportunities are there for Hungary in Indonesia in the field of agriculture and how can these be realized?'

3. Indonesian Agriculture

Indonesia's agricultural sector stands as a cornerstone of its economy, woven into the fabric of its society, culture, and history. It serves as the lifeblood of rural communities, providing employment and sustenance to millions. Beyond its contribution to livelihoods, Indonesian agriculture plays a pivotal role in the country's economic landscape. It accounts for a significant share of the nation's GDP, making it a driving force in the quest for economic growth and stability. The importance of agriculture in Indonesia extends far beyond its economic impact. It is intertwined with the nation's cultural identity, shaping traditions, festivals, and ways of life. From the terraced rice paddies of Bali to the sprawling cocoa plantations of Sulawesi, agriculture paints a vivid picture of Indonesia's diversity and resourcefulness⁰.

3.1. Key challenges

While Indonesian agriculture holds immense promise, it is not without its challenges. One of the foremost challenges is the need for sustainability. Rapid urbanization, deforestation, and unsustainable farming practices have placed tremendous pressure on Indonesia's natural resources and ecosystems⁰. Balancing the imperative of increased agricultural productivity

⁰ Prayitno, G., Dinanti, D., Hidayana, I. I., & Nugraha, A. T. (2021). Place attachment and agricultural land conversion for sustainable agriculture in Indonesia. *Helikon*, 7(7), e07546.

⁰ Fuglie, K. O. (2004). Productivity growth in Indonesian agriculture, 1961–2000. *Bulletin of Indonesian Economic Studies*, 40(2), 209–225

⁰ Rondhi, M., Pratiwi, P. A., Handini, V. T., Sunartomo, A. F., & Budiman, S. A. (2018). Agricultural Land Conversion, Land Economic Value, and Sustainable Agriculture: A Case Study in East Java, Indonesia.

with the preservation of the environment is a delicate tightrope walk⁰.

Modernization represents another critical frontier. To keep pace with the global agricultural landscape, Indonesia must embrace technological advancements and innovative farming practices. A lack of access to modern farming equipment and techniques poses a barrier to achieving optimal productivity^{0 0}.

Moreover, Indonesia's agricultural sector is marked by economic disparities. While some regions, notably Java and Bali, experience robust agricultural growth and development, others, particularly in eastern Indonesia, grapple with economic inequalities and limited access to resources. Addressing these disparities and ensuring that the benefits of agricultural growth are equitably distributed across the nation is a pressing challenge^{0 0}.

2. Hungarian Agriculture

Hungary's contemporary agricultural landscape is marked by a commitment to technological advancements and innovation. Precision farming techniques have become a hallmark of Hungarian agriculture, enhancing productivity, resource utilization, and environmental sustainability. The adoption of precision agriculture technologies has transformed farming practices. GPS-guided machinery, remote sensing, and data analytics have become integral components of Hungarian agriculture. These innovations enable farmers to precisely manage planting, irrigation, and harvest operations, resulting in increased yields and reduced environmental impact. Digitalization and connectivity play pivotal roles in Hungary's agricultural success. The integration of digital tools and IoT applications allows for real-time monitoring of crops, soil conditions, and weather patterns. This data-driven approach empowers farmers with timely insights, facilitating informed decision-making and optimized performance. Although the listed technologies have been introduced in Hungary, the nationwide use of them is still far away, but the launch of these innovative programs marks the future of Hungarian agriculture^{0 0}. Research and development efforts in Hungary's agricultural sector are robust and far-reaching. The nation invests significantly in agricultural research institutions, where scientists and experts work tirelessly to drive advancements in crop breeding, disease resistance, and sustainable farming practices. These innovations not only benefit Hungary but also have the potential to contribute to global agricultural challenges.

Land,7(4), 148.

⁰ Naylor, R. L., Battisti, D. S., Vimont, D. J., Falcon, W. P., & Burke, M. B. (2007). Assessing risks of climate variability and climate change for Indonesian rice agriculture. *Proceedings of the National Academy of Sciences*, 104(19), 7752–7757.

⁰ David, W. & Ardiansyah. (2016). Organic agriculture in Indonesia: challenges and opportunities. *Organic Agriculture*, 7(3), 329–338.

⁰ Syuaib, M. F. (2016). Sustainable agriculture in Indonesia: Facts and challenges to keep growing in harmony with environment. *Agricultural Engineering International: CIGR Journal*, 18(2), 170–184.

⁰ Fuglie, K. O. (2009). Sources of growth in Indonesian agriculture. *Journal of Productivity Analysis*, 33(3), 225–240.

⁰ Suryahadi, A., & Hadiwidjaja, G. (2011). *The Role of Agriculture in Poverty Reduction in Indonesia*. SMERU Research Institute.

⁰ Popp, J., Szenderák, J., Fróna, D., Felföldi, J., Oláh, J., & Harangi-Rákos, M. (2019). A magyar mezőgazdaság teljesítménye 2004-2017 között. *Jelenkori Társadalmi És Gazdasági Folyamatok*, 13(3-4), 9–20.

⁰ Szabó, B. (2023). A magyar mezőgazdaságban rejlő lehetőségek. *Corvinus Research Archive (Corvinus University of Budapest)*, 2(2), 33–35.

Hungary places a strong emphasis on sustainability and environmentally responsible farming practices. Soil conservation is a cornerstone of this commitment, with comprehensive strategies in place to protect soil health and prevent erosion. Erosion control measures, organic matter enrichment, and pH management are integral components of Hungary's soil conservation efforts⁰.

Organic farming has gained prominence within Hungary's agricultural landscape. The principles of organic farming, which prioritize soil health, biodiversity, and minimal chemical inputs, are diligently followed. Rigorous certification processes ensure the authenticity of organic products, appealing to consumers both domestically and abroad. In alignment with environmental sustainability, Hungary has embraced environmentally friendly pest control practices. Integrated pest management strategies, biopesticides, and reduced chemical pesticide usage are key elements of Hungary's pest control approach. These practices not only mitigate the environmental impact but also contribute to the long-term health of agricultural ecosystems⁰.

3. Investment Opportunities in Indonesia

Indonesia's vibrant agricultural sector presents a multitude of investment opportunities that Hungary can explore to foster economic cooperation and mutual growth. This chapter delves into the specifics of these opportunities, offering a comprehensive understanding of how Hungary's agricultural expertise and investment can make a substantial impact on Indonesia's agricultural landscape.

3.1. Technology Transfer and Modernisation

The adoption of modern farming practices is pivotal to enhancing the productivity and sustainability of Indonesian agriculture. Hungary's well-established agricultural technology sector can serve as a guiding light in this endeavor. Through collaborative efforts, Hungary can facilitate the transfer of cutting-edge technologies that encompass precision agriculture, automated machinery, and smart irrigation systems. These innovations have the potential to revolutionize Indonesian farming by enabling farmers to optimize resource usage, minimize waste, and increase crop yields.

However, technology transfer isn't just about equipment; it's also about knowledge. Capacity building initiatives will be essential to ensure that Indonesian farmers and agricultural professionals possess the necessary skills and expertise to effectively implement and manage these technologies. Training programs and workshops can be tailored to address specific needs, including equipment operation, data analysis, and farm management, thereby ensuring the sustainable and successful adoption of modern practices.

3.2. Sustainable Agricultural Practices

Sustainability lies at the core of the global agricultural agenda, and Indonesia is no exception. Hungary's expertise in organic farming can serve as a guiding role in promoting sustainability within Indonesian agriculture. Collaborative projects can focus on the adoption of organic

⁰ Goda, A. (2018). *Korszerű termelés-és minőségmenedzsment eszközök a magyar mezőgazdasági gépgyártókánál* Doktori (PhD) értekezés tézisei. Szent István University.

⁰ Szabó, B. (2023). A magyar mezőgazdaságban rejlő lehetőségek. *Corvinus Research Archive (Corvinus University of Budapest)*, 2(2), 33–35.

farming principles, which emphasize soil health, reduced chemical usage, and the conservation of biodiversity.

By transitioning toward organic farming, Indonesian agriculture can attain long-term resilience while meeting the increasing demand for environmentally friendly and healthier produce. Additionally, sustainable agricultural practices extend to crop rotation and soil conservation techniques. Hungary's experiences and best practices in these areas can be shared with Indonesian farmers, enabling them to optimize land use, prevent soil erosion, and maintain soil fertility. These efforts not only enhance agricultural sustainability but also contribute to Indonesia's overall environmental preservation.

3.3. Crop diversification

Diversifying Indonesia's agricultural production is crucial for both food security and economic development. Hungary, with its rich agricultural diversity, can inspire and assist in the introduction of new crops and varieties tailored to local conditions. This diversification effort can reduce the country's reliance on a few staple crops and enhance its ability to withstand the challenges posed by changing climates and market demands. By exploring the cultivation of specialty crops, Indonesia can tap into niche markets and increase the value of its agricultural output.

Furthermore, Hungary's agricultural research expertise can facilitate the development of crop varieties specifically adapted to Indonesia's diverse climate zones. These adapted varieties are more likely to thrive in local conditions, being more resilient to pests, diseases, and environmental stressors. Such diversification efforts can lead to higher crop yields, improved product quality, and increased income for Indonesian farmers, ultimately contributing to the nation's agricultural and economic growth.

3.4. Food Processing and Value Addition

Hungary's advanced food processing industry can provide valuable insights into setting up processing facilities that enhance the shelf life and marketability of local agricultural products.⁰ By processing and adding value to produce, Indonesia can capitalize on a broader range of export opportunities and create employment opportunities within the country. Additionally, adhering to international quality standards and certifications is paramount to ensure that Indonesian agricultural products meet the stringent requirements of global markets. Hungary's expertise in quality control and certification processes can guide Indonesian producers in achieving higher market competitiveness, paving the way for greater market access and increased export potential.

4. Strategies for Collaboration

Effective collaboration strategies are essential for Hungary to maximize the benefits of its investment in Indonesian agriculture while safeguarding its interests. This chapter explores nuanced approaches that encompass public-private partnerships, training and capacity building, research and development initiatives, market access and promotion, financial support mechanisms, and sustainable supply chain development.

⁰ HEPA (2023) Food Industry in Hungary

4.1. Public-Private Partnerships

PPPs can serve as the backbone of Hungary's collaboration strategy in Indonesian agriculture. Hungary should actively engage with Indonesian government agencies, private enterprises, and agricultural associations to establish and strengthen these partnerships. To ensure mutual benefits, Hungary can adopt the following strategies:

1. **Engaging Key Stakeholders:** Hungary should proactively identify and engage key stakeholders within Indonesia's agricultural sector. This includes government bodies responsible for agriculture, industry associations, and major agribusiness players.
2. **Tailored Investment Frameworks:** Hungary can work with Indonesian partners to develop tailored investment frameworks within PPPs. These frameworks should create a conducive environment for private investments by providing clear guidelines, risk-sharing mechanisms, and incentives.
3. **Sector-Specific Partnerships:** Hungary can explore sector-specific partnerships, such as collaborating with Indonesian agribusiness companies to establish joint ventures for the production and processing of specific agricultural products. For instance, partnering with Indonesian palm oil producers for sustainable palm oil production can be a mutually beneficial venture.

4.2. Training and Capacity Building

Knowledge exchange and capacity building are vital components of Hungary's investment strategy. Hungary can facilitate knowledge transfer and skill development in Indonesian agriculture through the following approaches:

1. **Collaborative Training Centres:** Establishing collaborative training centers in Indonesia where Hungarian experts provide hands-on training to local farmers on modern farming practices and the use of advanced agricultural technologies.
2. **Workshops and Mentorship:** Hungary can organize workshops and mentorship programs, inviting Indonesian farmers to learn from Hungarian counterparts. This knowledge exchange can focus on topics such as sustainable farming, pest management, and efficient irrigation practices.
3. **Scholarship Programs:** Hungary can offer scholarships to Indonesian students and professionals in the field of agriculture to study in Hungarian agricultural institutions. This not only enhances human capital but also fosters long-term relationships.

4.3. Research and Development Initiatives

Collaborative research and development projects can drive innovation and address specific agricultural challenges in Indonesia. Hungary's R&D expertise can be leveraged in the following ways:

1. **Joint Research Projects:** Hungary can collaborate with Indonesian universities and research institutions on joint research projects. For instance, partnering to develop drought-resistant crop varieties tailored to Indonesian conditions.

2. **Agricultural Innovation Hubs:** Establishing agricultural innovation hubs in Indonesia can centralize R&D efforts. These hubs can bring together scientists, researchers, and entrepreneurs to work on cutting-edge agricultural technologies.

3. **Innovation Contests:** Hungary can organize innovation contests in partnership with Indonesian stakeholders, encouraging local innovators to develop solutions for agricultural challenges. Providing funding and mentorship for winning projects can drive innovation.

4.4. Market Access and Promotion

Ensuring market access for Indonesian agricultural products and promoting them effectively is essential. Hungary can support Indonesia in the following ways:

1. **Trade Agreements:** Hungary can collaborate with Indonesia to negotiate favorable trade agreements that facilitate the export of Indonesian agricultural products to Hungarian and European markets.

2. **Export Promotion:** Jointly organizing trade fairs and exhibitions that showcase Indonesian agricultural products in Hungary can boost visibility and demand. These events can attract Hungarian buyers and investors.

3. **Branding and Marketing:** Hungary can assist Indonesia in branding and marketing its agricultural products. For example, creating a brand identity for premium Indonesian coffee or spices can increase their appeal in international markets.

By implementing these collaborative strategies, Hungary can not only enhance the impact of its investment in Indonesian agriculture but also establish itself as a trusted partner in Indonesia's agricultural growth and development. These strategies emphasize the mutual benefits of cooperation and underscore Hungary's commitment to sustainable and inclusive agricultural development in Indonesia.

5. Case Studies in Sustainable Supply Chain Development

In the pursuit of sustainable supply chain development, Hungary's investment plan in Indonesian agriculture can draw valuable insights from case studies. These real-world examples offer tangible strategies, best practices, and success stories that Hungary can leverage to maximize the impact of its investments while ensuring the sustainability and efficiency of supply chains.

5.1. Cold Chain Infrastructure Development

A compelling case study for Hungary's investment plan is the development of a cold chain infrastructure in partnership with Indonesian stakeholders. By examining successful cold chain projects from Hungary and other countries, Hungary can devise a blueprint for establishing state-of-the-art cold storage facilities and refrigerated transport networks in Indonesia. For instance, Hungary can study its own experiences in creating efficient cold supply chains for fresh produce and dairy products, ensuring quality preservation from farm to market.

5.2. Sustainable Packaging and Handling Practices

Efficient packaging and handling practices are critical components of supply chain optimization. Hungary can delve into case studies that showcase innovative packaging and handling solutions, focusing on reducing post-harvest losses and ensuring product quality during transportation. Lessons learned from these case studies can inform the development of sustainable packaging and handling practices in Indonesian agriculture.

5.3. Quality Control and Traceability Systems

Quality control and traceability systems are integral to maintaining product quality and safety. Hungary can explore case studies where advanced quality control and traceability measures have been successfully implemented. These case studies can provide guidance on implementing robust quality assurance practices in Indonesian agriculture, which can be particularly beneficial for products destined for international markets.

5.4. Market Access through Certification

Lastly, Hungary can explore case studies that demonstrate how certification of agricultural products, such as organic, fair trade, or sustainability certifications, has facilitated market access. These case studies can illustrate the tangible benefits of such certifications, including access to premium markets and higher product prices.

By incorporating these case studies into its investment plan, Hungary can gain practical insights and proven strategies for sustainable supply chain development in Indonesian agriculture. These real-world examples offer tangible guidance for optimizing supply chains, enhancing product quality, and ensuring the long-term success of Hungary's investments, ultimately benefiting both Hungary and Indonesia in their economic collaboration in agriculture.

6. The importance of education

As Hungary contemplates a significant investment in Indonesia's agricultural landscape, it is essential to underscore the pivotal role that education plays in driving transformative change within the sector. The success of this prospective investment, particularly in the realms of crop diversification, precision agriculture, and related innovations, hinges upon an empowered and knowledgeable agricultural workforce.

This section delves into the importance of education for both Indonesia's farmers and those dependent on the agricultural sector, offering insights into how educational initiatives can act as catalysts for sustainable development and prosperity; and Hungarian investors, who need a deeper and wider knowledge about the country in order to make feasible investments which benefit both parties.

6.1. Education of Indonesia's farmers: Advantages

1. Enhancing Agricultural Productivity

Education acts as a cornerstone for boosting agricultural productivity. By imparting knowledge on modern farming techniques, sustainable practices, and the effective use of precision agriculture technologies, Indonesian farmers can maximize their yields while

minimizing environmental impact. Training programs tailored to the local context will equip farmers with the skills needed to adapt to innovative agricultural practices, contributing to increased efficiency and overall productivity.

2. Crop Diversification and Economic Resilience

A diversified agricultural portfolio is crucial for mitigating risks associated with climate change and market fluctuations. Education plays a vital role in introducing farmers to alternative crops and cultivation methods. By fostering a deeper understanding of crop diversification strategies, farmers can enhance their adaptability to changing environmental conditions, thereby bolstering their economic resilience and long-term sustainability.

3. Adopting Precision Agriculture

Precision agriculture, with its reliance on cutting-edge technologies and data-driven decision-making, demands a workforce well-versed in the intricacies of these advancements. Educational initiatives must focus on introducing Indonesian farmers to precision agriculture tools, sensor technologies, and data analytics, enabling them to make informed choices that optimize resource use, reduce waste, and enhance overall farm efficiency.

4. Empowering Rural Communities

Beyond the farm, education has the potential to uplift entire rural communities dependent on agriculture. By providing access to relevant training programs, farmers and their families can diversify their skills, exploring new avenues for income generation beyond traditional farming. This diversification is not only economically beneficial but also helps create more robust and self-sufficient rural economies.

6.2. Disadvantages

The modernization and mechanization of agriculture in Indonesia, while promising increased efficiency and productivity, can indeed have significant social and economic implications for the individuals who may lose their jobs as a result of these changes. Addressing the potential challenges and providing solutions to support those affected is crucial for a holistic and sustainable approach to agricultural transformation.

1. Job Displacement

The adoption of modern technologies such as automation, precision agriculture, and machinery may lead to a reduced demand for manual labor in certain agricultural tasks. Traditional jobs related to manual farming practices may become obsolete, potentially displacing a portion of the existing workforce.

2. Transition to New Skills

To mitigate the impact of job displacement, there is a need for targeted retraining and upskilling programs. Offering education and training opportunities that equip individuals with the skills required to operate, maintain, and manage modern agricultural technologies can facilitate a smoother transition for the workforce.

3. Entrepreneurship Opportunities

As agriculture becomes more technologically advanced, there may be opportunities for displaced workers to transition into entrepreneurial roles. Training programs and support for individuals interested in starting their own agricultural businesses, perhaps focusing on niche markets or value-added products, can foster economic resilience and independence.

4. Social Safety Nets

The government and other stakeholders should establish robust social safety nets to support those adversely affected. This may include unemployment benefits, retraining programs, and financial assistance to help individuals weather the transitional period and explore new opportunities.

Ultimately, a comprehensive and inclusive approach that combines technological innovation with social and economic support mechanisms is essential to navigate the challenges associated with the modernization of agriculture and to ensure the well-being of the affected individuals and communities in Indonesia.

6.3. Education of Hungarian investors

Education is a critical factor for Hungarian investors seeking to make informed and successful investments in Indonesia's agricultural sector. A well-informed investor base contributes not only to the financial success of the investment but also to the development of sustainable and mutually beneficial partnerships between Hungary and Indonesia. Here are key aspects highlighting the importance of education for Hungarian investors:

1. Understanding Local Context

Education provides Hungarian investors with valuable insights into the local context of Indonesia. Understanding the cultural, social, economic, and political landscape is essential for making informed decisions. Knowledge about Indonesia's history, regulatory environment, and business practices helps investors navigate potential challenges and capitalize on opportunities specific to the region.

2. Agricultural Sector Dynamics

Education about Indonesia's agricultural sector, including its current state, challenges, and opportunities, is crucial. This includes knowledge about predominant crops, farming practices, and the impact of climate and environmental factors on agriculture. Such insights enable Hungarian investors to tailor their strategies to align with the unique characteristics of Indonesia's agricultural industry.

3. Market Trends and Consumer Behavior

Education equips investors with an understanding of market trends and consumer behavior in Indonesia. This is particularly relevant in agriculture, where shifts in consumer preferences, demand for specific products, and awareness of sustainable and ethical practices can significantly influence investment outcomes.

4. Risk Mitigation

Education facilitates a comprehensive understanding of potential risks associated with the investment. This includes economic, political, and operational risks. By being aware of the challenges, investors can develop risk mitigation strategies, conduct thorough due diligence, and implement effective contingency plans to safeguard their investments.

5. Engagement with Local Stakeholders

Educational efforts enable Hungarian investors to engage effectively with local stakeholders, including farmers, communities, and governmental bodies. Building positive relationships and understanding the needs and concerns of these stakeholders is essential for the success of agricultural investments in Indonesia.

6. Adaptation to Technological Innovations

Continuous education allows investors to stay abreast of technological advancements in agriculture. This is particularly relevant in the context of precision agriculture and other innovations that can optimize productivity and sustainability. Investors who are well-versed in these technologies can make strategic decisions that incorporate the latest advancements.

7. The opportunity of regenerative rainforests

As Hungary contemplates a transformative investment in Indonesia's agricultural sector, there is a unique and promising avenue that beckons exploration – regenerative rainforest agriculture. This paradigm shift represents not only a departure from conventional agricultural practices but also a visionary approach towards sustainable and environmentally conscious investments. This section delves into the possibilities of regenerative rainforest agriculture, highlighting the crops that can thrive in its soil and the broader implications for the success of Hungary's investment in Indonesia.

7.1. A sustainable approach

Regenerative rainforest agriculture aims to restore and enhance the ecological health of rainforest ecosystems while simultaneously supporting agricultural production. Unlike traditional agricultural methods that may contribute to deforestation and environmental degradation, regenerative practices focus on maintaining and improving the ecosystem.

The rich and diverse soils of rainforests present unique opportunities for cultivating a variety of crops. Certain crops are well-adapted to the specific conditions of rainforest soils, including their high organic content and unique nutrient profiles. Examples of crops that can thrive in such environments include tropical fruits like durian, mangosteen, and rambutan, as well as other staples like cocoa, coffee, and spices.

Regenerative rainforest agriculture emphasizes biodiversity conservation as a core principle. By cultivating a diverse range of crops and integrating agroforestry practices, this approach contributes to the preservation of native plant and animal species. Biodiversity not only enhances ecosystem resilience but also provides natural pest control, reducing the need for synthetic inputs.

Rainforests play a crucial role in carbon sequestration and mitigating climate change. Regenerative practices enhance these natural processes by promoting the growth of trees and

vegetation. Through Hungary's investment in regenerative rainforest agriculture, there is an opportunity to contribute to global climate goals while fostering resilience in the face of climate variability.

7.1.1. Feasibility

The success of regenerative rainforest agriculture hinges on collaboration with local communities. Educational programs aimed at training local farmers in regenerative practices empower them to be stewards of the land. This collaborative approach ensures that the benefits of the investment extend beyond economic gains to encompass social and environmental well-being.

Regenerative rainforest agriculture is not only environmentally sound but also economically viable. The cultivation of high-value, sustainably sourced crops align with global consumer trends favoring ethically produced and environmentally friendly products. Hungary's investment in such practices positions it at the forefront of emerging markets for responsibly sourced agricultural products.

In the pursuit of a sustainable and impactful investment in Indonesia's agricultural sector, the exploration of regenerative rainforest agriculture stands as a visionary opportunity. By cultivating crops suited to rainforest soils, embracing biodiversity conservation, and aligning with global sustainability goals, Hungary can not only contribute to environmental preservation but also foster resilient and prosperous agricultural communities in Indonesia.

This forward-thinking approach not only aligns with modern agricultural trends but also positions Hungary as a leader in sustainable and socially responsible investments on the global stage.

7.2. Doubts and Promises

Assessing the doubts and promises surrounding the potential Hungarian agricultural investment in Indonesia, particularly in the context of regenerative rainforest agriculture, requires a balanced evaluation of both opportunities and challenges.

7.2.1. Doubts:

The transition to regenerative rainforest agriculture may pose implementation challenges, including the need for significant initial investments, changes in traditional farming practices, and potential resistance from local communities. Furthermore, while there is potential for economic viability, market uncertainties, including fluctuations in global commodity prices and consumer preferences, may impact the profitability of the venture.

The success of regenerative agriculture often requires a long-term commitment. Doubts may arise regarding Hungary's ability to sustain its involvement over an extended period, especially if faced with economic or geopolitical challenges.

The factors of geopolitics and climate change cannot be avoided in these matters as well: since the success of rainforest agriculture is closely tied to climate conditions. Climate variability and extreme weather events may pose risks to crop yields and overall productivity. Also, global economic trends, including geopolitical tensions or economic downturns, could impact the investment's profitability and market access.

7.2.2. Promises:

The focus on regenerative rainforest agriculture aligns with global sustainability goals. It has the potential to contribute to carbon sequestration, biodiversity conservation, and overall environmental health. By cultivating high-value crops suited for rainforest soils, Hungary could tap into lucrative markets for sustainably sourced agricultural products. The economic viability of such ventures can lead to long-term profitability.

The global shift towards ethical and environmentally friendly products presents an opportunity for Hungary to position itself as a responsible and forward-thinking player in the agricultural market. Furthermore, collaborating with environmental organizations and local stakeholders can enhance the positive impact of the investment, fostering a collaborative and inclusive approach.

In conclusion, while the promises of a Hungarian agricultural investment in Indonesia, particularly in regenerative rainforest agriculture, are compelling, addressing doubts is essential for a realistic assessment. Thorough risk analysis, stakeholder engagement, and adaptive management strategies are crucial for Hungary to navigate the complexities of such an investment and maximize the potential benefits for both countries. A carefully crafted and flexible approach that considers both environmental and socio-economic factors will be key to the success of this venture.

8. Conclusion

Hungary's engagement in Indonesian agriculture presents numerous opportunities for mutual benefit and international economic cooperation. By strategically investing in Indonesia's agricultural sector, Hungary can tap into these opportunities while advancing its own economic interests. The opportunities span various dimensions.

In technological advancement, Hungary's technological expertise can drive efficiency and productivity in Indonesian agriculture, benefiting both nations. This collaboration also opens doors for Hungarian technology providers to expand globally. Hungary's commitment to sustainability aligns well with Indonesia's growing emphasis on responsible agriculture. Hungary can guide Indonesia in adopting sustainable practices, fostering eco-friendly pest control methods and responsible land use. Investment in crop diversification enhances Indonesia's food security and creates markets for Hungarian agricultural products, exemplifying the mutual gains. Hungary's role in optimizing supply chains, reducing losses, and ensuring product quality throughout the supply chain benefits Indonesian agriculture and enhances market access.

Hungary's promotion of fair-trade practices and sustainability certifications elevates the marketability of Indonesian products while aligning with ethical business standards. To seize these opportunities, Hungary should forge strategic partnerships by establishing public-private partnerships with Indonesian stakeholders to create an enabling investment environment. Promote knowledge transfer and capacity building through training programs, workshops, and scholarships. Collaborate on research projects and establish agricultural innovation hubs to drive innovation in Indonesian agriculture.

Negotiate trade agreements, organize trade fairs, and promote Indonesian products in international markets. Ensure supply chain efficiency, responsible handling practices, and quality control to safeguard product quality.

In conclusion, Hungary's investment plan in Indonesian agriculture signifies its commitment to international cooperation and sustainability. By strategically navigating these opportunities, Hungary can foster mutual growth, set an example of responsible global partnership, and contribute substantively to economic development, food security, and sustainability in Indonesia and beyond.

9. Conclusion of the study trip's findings

During the study trip, I had the opportunity to present the project to as many experts and relevant professionals as possible, who tried to give their opinion on it to the best of their ability, and also to add: to mention areas to be researched, which could further help the relevance of the project, and promote its success and feasibility.

Most of the feedback about the project turned out to be basically positive. It should be noted that the distance and the potential size of the Hungarian investment volume raised doubts among the experts, however, technological development, precision farming, and crop diversification were the main elements of the investment outlined in the research, which were clearly classified as useful, necessary, and feasible.

Based on the insights, the education of local small and large producers turned out to be a significantly larger topic than it originally received in the research. Beyond that, the role of education is of particular importance in this topic: since it is important to examine such a structural transformation in other areas as well, since with the decrease in the proportion of people living from agriculture, the freed-up workforce must be absorbed by other sectors. Nevertheless, they found the inclusion of education in the project to be extremely valuable, as it made it clear that the goal of the investment was the real development of the country.

The only addition that opened new doors for the project was the idea of the regenerative rainforest, specifically the crops that can live on its soil, and its feasibility from the point of view of Hungarian investors.

They expressed doubts about the Hungarian investors' knowledge of Indonesia, which may cause cultural and professional obstacles. After all, Hungarian agriculture is much more uniform than Indonesian agriculture, both in terms of the social and economic role of agriculture, so it is of utmost importance to make a decision with this in mind.

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Accelerating Hungarian-Indonesian Economic Relations: Investing in Indonesian Energy

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1. Abstract

The study focuses on accelerating Hungarian-Indonesian economic relations through investment in Indonesian energy, specifically targeting the electric vehicle manufacturing industry. It provides an insightful overview of Indonesia's economic landscape, highlighting its emergence as a major player in the region and its steady economic growth. The study also delves into the historical context of bilateral relations between Hungary and Indonesia, emphasizing successful economic ventures and technological transfers. Furthermore, it outlines the proposed project, with a specific emphasis on Phase A/1, which aims to capitalize on Indonesia's abundant nickel reserves to drive the country's foray into electric vehicle production. The study explores how this initiative aligns with the global push towards renewable energy and its potential to position Indonesia as a regional leader in sustainable energy solutions. The second part of the project promotes a comprehensive energy infrastructure development focused on solar energy. Ultimately, the study underscores the promising prospects of Hungary's investment in Indonesian energy as a mutually beneficial opportunity for both nations.

2. Introduction

Indonesia is an island nation located in Southeast Asia, bordering both the Indian and Pacific oceans. It consists of over 17,000 islands, the most populous of which is Java. It is home to more than half of the country's 278 million people, which makes Indonesia the 4th most populous country in the world. Following three and a half centuries of Dutch colonialism, Indonesia secured its independence after World War II. Indonesia's history has since been turbulent, with challenges posed by natural disasters, corruption, separatism, a democratization process, and periods of rapid economic change.

Indonesia has a mixed economy in which the private sector and government play vital roles. As the only G20 member state in Southeast Asia, the country has the largest economy in the region and is classified as a newly industrialized country. Per a 2023 estimate, it is the world's 16th largest economy by nominal GDP and 7th in terms of GDP at PPP.⁰ Relatively steady inflation and an increase in GDP deflator and the Consumer Price Index have contributed to strong economic growth in recent years. From 2007 to 2019, annual growth accelerated to between 4% and 6% due to improvements in the banking sector and domestic consumption,⁰

⁰ IMF (2023). *World Economic Outlook Database*.
<https://www.imf.org/en/Publications/WEO/weo-database/2023/April/>

⁰ IMF (2023). *World Economic Outlook Database*.
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helping Indonesia weather the 2008–2009 Great Recession and regain in 2011 the investment grade rating it had lost in 1997. Indonesia depends on the domestic market and government budget spending and the ownership of state-owned enterprises (the central government owns 141 enterprises). The administration of prices of a range of basic goods (including rice and electricity) also plays a significant role in Indonesia's market economy. However, since the 1990s, the majority of the economy has been controlled by individual Indonesians and foreign companies.⁰

Hungary established diplomatic relations with Indonesia in 1955 and opened its embassy two years later. In 2004, to foster the economic and trade relations, and speed up economic cooperation, the Joint Economic Committee at ministerial level was re-established. Ever since, numerous successful economic ventures have taken place, and technological transfer constitutes one of the key areas in this regard. Successful sectors of Hungarian exports include agrotech, water management technology and ICT technologies. As another important milestone in our bilateral economic relations, on January 27, 2021, the Indonesian Ministry of Public Works and Housing's Toll Regulatory Agency (BPJT) officially announced that the Hungarian company Roatex Zrt. won the tender for the implementation of the cashless and contactless Multi Lane Free Flow (MLFF) electronic toll payment system on Indonesian highways, and they can sign a concession agreement for 10 years. During the implementation of the system, the company will carry out an investment worth more than USD 300 million. The establishment of the new electronic toll network covering the entirety of the fourth most populous country in the world represents one of the largest Hungarian technological exports ever.⁰

3. The Project: Phase A/1

This project concentrates on the push to make Indonesia more green. Our first goal would be assuming a major role in the country's (and consequently the region's) electric vehicle manufacturing industry. We would aim to accelerate the adaptation and implementation of electric vehicles (EVs) into the mainstream, by taking control of the necessary nickel production. The scale of the planned operations would be enough not only to satisfy the internal market, but it would also put Indonesia on the map regionally in this strain of the industry. Phase A/1 would concentrate more on the resources and planning related to the project. The catalyst for this project is the abundance of nickel in Indonesia. Its reserves, which total 21 million tons, have allowed Indonesia to become the world's largest nickel producer.⁰ Considering the global push towards renewables and carbon neutrality, it is not surprising to learn that construction has started for the first battery plants in the entire region of Southeast Asia.⁰

We can comfortably say that nickel production will not be slowing down for quite some time, so as a stable base for our project, we can look to invest in one of the leading nickel

⁰ Adhi, A. (2015). 80 Persen Industri Indonesia Disebut Dikuasai Swasta. *Surja.co.id*, 3. March 2015. <https://surabaya.tribunnews.com/2015/03/03/80-persen-industri-indonesia-disebut-dikuasai-swasta#>.

⁰ Magyarország jakartai nagykövetsége (2023). *Gazdasági kapcsolatok - Indonézia*. <https://jakarta.mfa.gov.hu/page/gazdasagi-kapcsolatok-indonezia>

⁰ U.S. Geological Survey. (2020). *Mineral commodity summaries 2020*, Reston, VA: U.S. Geological Survey.

⁰ Permana, E. (2021). Work begins on EV battery plant in Indonesia. *Anadolu Agency*, 15 September 2021. <https://www.aa.com.tr/en/asia-pacific/work-begins-on-ev-battery-plant-in-indonesia/2365290>.

processing companies in the country. Due to the fact that the market is highly competitive, no one company has a stranglehold on the industry, meaning we have a near equal footing against all competitors.⁰ One of the most prominent mining companies present in Indonesia is Vale S.A. Should we sponsor their operations there, we would be partnering with a company dedicated to sustainability, which fits into our *modus operandi* as well. Other than mining, Vale takes great responsibility for keeping the entire business process running as smoothly as possible, so in addition to mining, they take care of their production chain, investing in logistics and energy to ensure that their operations are efficient.⁰ Seizing local control of our mining operations is required to initiate the latter phases of the project, namely the construction of our own EV battery plant among others.

Considering legislation and government attitude towards mining, the Indonesian government recognized the economic benefits of nickel mining, especially in regions with significant nickel deposits like Sulawesi. The mining sector contributed to job creation, export revenue, and foreign investment. Indonesia has also been pursuing resource nationalism policies aimed at increasing government control over the mining sector. This includes requirements for companies to divest a percentage of their ownership to Indonesian entities. This would pose no real problem for our project, as Vale S.A. already has a long-standing mining agreement with the government. Additionally, the government has encouraged value-added processing within Indonesia to boost the domestic industry and create more jobs. This often means that companies are required to build smelters and refine nickel ore domestically before export. As previously mentioned, Vale takes responsibility for the entire process of mining, meaning that we would align with this government requirement and refine the ore ourselves.

4. The Project: Phase A/2

In the second phase, focus would be shifted to the aforementioned EV battery plants. This is where Hungary would play a key role, as the construction of our very own plants are nearing ever closer. By the time operations in Indonesia would begin, Hungarian representatives would have the experience and expertise in the construction and operation of such plants. While the main workforce would obviously be Indonesian, project and group leaders could travel from Hungary to oversee operations. The plant would be located on the island of Sulawesi. Previous EV battery plants have been located on the main island of Java, however, to make transportation more effective and to reduce costs, building our plant on Sulawesi, the site of nickel mining of the company Vale in Indonesia, seems more logical. Although Java is more infrastructurally developed, railways related to mining activities are sufficiently present in Sulawesi for the purposes of our project. Our production goal would be to amass around 100,000 units per year, based on the numbers provided by competitors on our market.⁰

It would be easy to find a business partner in this venture, as reports have expressed great confidence regarding Tesla's plans on investing in EV production in Indonesia, thanks to its great nickel reserves. Tesla CEO, Elon Musk is supposedly planning on visiting the country in late September or early October.⁰ With this event nearing ever closer, it would be crucial to get the timing right and strike up a business partnership with Tesla. One possible formation to

⁰ GlobalData. (2023). *Nickel production in Indonesia and major projects*, GlobalData

⁰ Vale (2024). *What we do*. <https://vale.com/what-we-do>

⁰Byun H., (2023) Hyundai to ramp up EV production in Indonesia, The Korea Herald <https://www.koreaherald.com/view.php?ud=20230725000706>

consider would be the following: the Hungarian venture controlling a share of nickel mining, refining and EV battery production would keep sole responsibility above these processes, however after a deal with Tesla, they would receive a majority of manufactured batteries for further use in their process of EV production. Since our project does not consist of car manufacturing, this would be a very closely related partnership, a symbiotic relationship so to say, as we would be relying on them to make this venture worthwhile. On the other hand, if our plant gets built on schedule, it would become increasingly difficult for Tesla to compete with the local market in terms of battery production, leading to the sought-after partnership creating a win-win situation for both parties.

5. The Project: Phase B/1

Alongside the goal of assuming a major role in EV production, in the Southeast Asian region, within the confines of the project and our push to make Indonesia more green, we would include the provision of a completely adequate, start-to-finish energy service consisting of energy capture, transfer and storage solutions, and later the operation of such solutions, while finding suitable partners for the production and implementation of these products. Indonesia consists of multiple islands with a highly fragmented national grid and off-grid infrastructure. This presents an opportunity for projects to offer efficient technologies for generation, storage, and transmission. Generation, storage, and transmission are three critical components of functional electricity infrastructure. Research shows that the average amount of solar power that Indonesia receives per square meter is almost double that of some countries in Europe. We see significant growth opportunities in solar as it is the most cost-effective and flexible option for power generation.⁰ Located at the equator, Indonesia's solar potential is the highest of all renewable sources, with an average generation potential of 4.8-5.1 kWh/m²/day, or 112,000 GWp/day. Solar energy is currently the lowest cost and most flexible option in Indonesia. Currently, solar has by far the lowest cost and the highest flexibility in terms of set up.

These factors all line up for us to choose to start our energy project with solar generation. Currently there are a few solar generators, mostly in Central Java, namely near Kaliurip village and Cilacap. These are merely a couple of instances highlighting the advancements occurring in Indonesia concerning the integration of solar energy into decentralized energy solutions. However, it's essential to acknowledge that the predominant energy source in the Java-Bali region continues to be modern coal-fired power plants operated by the state-owned utility company, PLN. This reliance poses a challenge to Indonesia's aspiration of achieving net-zero carbon emissions by 2060. In contrast, several other regions in the country face limitations in terms of installed capacity, power grid infrastructure, and grid stability. Consequently, these areas frequently experience power interruptions or have limited access to electricity on a continuous basis. Given these circumstances, depending solely on PLN for energy supply, whether for industrial or residential needs, is often considered financially impractical. This underscores the growing demand for decentralized energy solutions. The

⁰ Reuters (2023). Indonesia says Tesla plans to invest in battery material facility. *Reuters*, <https://www.reuters.com/business/autos-transportation/indonesia-says-tesla-plans-invest-battery-material-facility-2023-08-14/>.

⁰ East Ventures. (2023). The future is green: unlocking Indonesia's renewable energy potential. *East Ventures*, 6, February 2023. <https://east.vc/news/insights/the-future-is-green-unlocking-indonesias-renewable-energy-potential/>.

highest potential can be found in the eastern regions of the archipelago, where the provision of electricity by PLN is only partial. In these areas, national estimates suggest that solar energy potential can reach as high as 6 kWh/m²/day.⁰

We would plan on getting the most out of this potential with a deal similar to what Singapore has signed regarding the installation of large-scale solar energy and storage plants to supply power to the islands and Singapore.⁰ By keeping operations close together, the island of Sulawesi could serve as a great site for solar power farms. To bolster the cooperation between Hungary and Indonesia, all tech, including the solar panel technology would come from Hungarian companies, for the purposes of this project, Soler PARTNERS Kft. will be our company of choice. They already perform commercial solar panel installations, and we plan to steadily scale up their operations. Responsible for the Hungarian power grid was originally MVM Ltd., but since 2005, all of the company's transmission activities have been transferred to MAVIR Ltd. Keeping Hungarian cooperation at a maximum, we would work together with MAVIR Ltd. to invest heavily in the Indonesian power grid. Indonesia consists of multiple islands with a highly fragmented national grid and off-grid infrastructure. This presents an opportunity for our project to serve Sulawesi's power infrastructure and bring it up to a standard that would induce economic growth in the region generally. Also important to mention that it would also help our plans of operating the nickel mining and processing operations by improving connectivity and infrastructure in the area. As a result, the planned solar plant would be provided with all the necessary means to transfer the generated electricity around the island and between the islands of Indonesia itself.

Once again referencing the recent Singapore solar deal, the signed memorandum of understanding (MOU) entails 3000 hectares (30 km²) of land, with the following expected performance: a 1,380-megawatt peak (MWp) solar power plant and 3,000-megawatt hour (MWh) energy storage systems (ESS) on Combol island, and a 1,682 MWp solar plant and 3,500 MWh ESS on Citlim island. Based on a per capita energy usage in Indonesia of 10,000 kWh⁰, on energy consumption, this plant could serve half a million people's energy needs. Taking these calculations further, our planned EV plant in phase A/2 would use about 240,000 MWh to produce the EV batteries. This power consumption could easily be offset by a similar deal with the Indonesian government concerning a 3000-hectare land area, most of which would be used for solar energy production. Assuming a previously mentioned 6 kWh/m²/day production efficiency, about 65,000 GWh would be produced by the plant annually. After satisfying the need of the EV battery production plant, the remaining energy could be used to give power to a quarter of the island's inhabitants, keeping with a yearly power usage of 10,000 kWh per capita.

⁰ German-Indonesian Chamber of Industry and Commerce. (2022). *In decentralizing energy in Indonesia, future of solar power remains bright.* <https://indonesien.ahk.de/en/infocenter/news/news-details/in-decentralizing-energy-in-indonesia-future-of-solar-power-remains-bright>

⁰ Reuters (2022). Sunseap signs MOU to develop large-scale solar plants in Indonesia's Riau Islands. *Reuters*, 19. April 2022. <https://www.reuters.com/business/energy/sunseap-signs-mou-develop-large-scale-solar-plants-indonesias-riau-islands-2022-04-19/>.

⁰ Our World in Data (2022). *Primary energy consumption per capita.* <https://ourworldindata.org/grapher/per-capita-energy-use?region=Asia#explore-the-data>

6. The Project: Phase B/2

As for energy storage, we are planning to partner with a Hungarian company and make use of their invention, IntelliStore™. The IntelliStore™ system has been granted patent protection in key global markets. The innovation, developed by Hungarian engineers, has received protection in the United States, Europe, and countries in the Eurasian region over the past few weeks, with the process currently underway in China. The patent provides protection for the Hungarian invention for 20 years. The developer, AWE Engineering Services Ltd., plans to keep manufacturing in Hungary. By expanding education, operation, and service to an international scale, Hungary could become a major provider in research, development, and manufacturing related to electrical energy storage.⁰

According to energy experts, there is a worldwide surge in demand for high-capacity energy storage devices.⁰ These devices can offer more efficient and flexible solutions to grid-related issues caused by fluctuations in energy production, notably from solar and wind power sources. Over the past five years, experts at AWE Engineering Services Ltd., a Hungarian-owned company, have developed advanced lithium-ion battery-based devices, which can be considered among the most advanced in the world for use with fluctuating energy production, primarily from solar and wind farms. The battery storage, with a capacity of up to 1 megawatt-hour, can be transported and easily relocated either in a decentralized manner, close to the problem area, or centrally. Energy storage units, whether built in a centralized or decentralized manner, help maintain grid balance, supporting the daily activities of grid operators. This could play a key role in improving the connectivity and off-grid issues in Indonesia in the long run. Additionally, the equipment can provide uninterrupted power supply when needed for energy-intensive production facilities. It is capable of providing this service along with its other functions (grid services, power quality improvement, reactive power compensation), optimizing costs related to operational safety.

7. Reflecting on the Thoughts of Locals:

“Indonesia has long been battling a pollution problem, mainly in the form of plastics” – a local told me. In the footnoted video, you can clearly see where the problem is most prominent: the tourist-infested island of Bali.⁰ The video showed what happens when plastic production and consumption go unchecked. Indonesia has since taken actions to combat marine pollution, with the coordinating minister for Maritime Affairs and Investment (CMMAI), Luhut Pandjaitan, committing “Indonesia [to] embracing a sweeping, full-system-change approach to combating plastic waste and pollution.” Spearheaded by CMMAI, Indonesia’s Plan of Action on Marine Plastic Debris (2017-2025) targeted a 70% reduction in marine plastic debris by 2025, aiming to control plastic pollution at its source. Of this target, the government has reported a 35.36% reduction of marine plastic debris as of December 2022.⁰

⁰ DigitalHungary. (2016). Itt a magyar energiáról. *DigitalHungary*, 15. June 2016. <https://www.digitalhungary.hu/e-volution/Itt-a-magyar-energiatarolo/2970/>

⁰ IEA (2022) World Energy Outlook 2022

⁰ Guardian News. (2018). 'So much plastic!': British diver films deluge of waste off Bali. *Youtube*, 6. March 2018. <https://www.youtube.com/watch?v=ArYLGNe-jCA>.

⁰ Siong, K. et al. (2023). How Indonesia is combating marine plastic pollution from source to sea. *World Bank Blogs*, 1. June 2023. <https://blogs.worldbank.org/en/eastasiapacific/how-indonesia-combating-marine-plastic->

Second, major rivers are important sources of marine plastic waste. A study conducted between 2018 and 2020 tracked the final accumulation zones for plastic particles originating from Indonesia's three major rivers known as plastic debris hotspots. In the Cisadane and Musi Rivers, 65% of plastics accumulate close to the river mouth. In contrast, 90% of the plastic waste particles coming from the Solo River are dispersed broadly in Indonesian marine waters or drift away further into the Indian Ocean.

Third, single-use plastics (SUP) are the predominant plastic items identified in major rivers and on beaches. Using drones and artificial intelligence to detect and quantify marine plastic debris floating and/or washed ashore, our study found that at least half (47 to 65%) of plastic items along riverbanks comprise SUP items, such as cup lids, caps, and small plastic items. Although the findings may not be nationally representative with a sample size of just three rivers (Cisadane, Citarum, and Bali), they support the argument that phasing out SUPs is likely to reduce the volume of plastics leaking to Indonesia's marine environments. These findings are also consistent with other studies, including a national scale stranded macro-debris study that found that SUPs were the dominant microplastic debris on 18 beaches in Indonesia.⁰

Shifting focus to the student analysis of the paper, while the response was mainly positive, as follows: "In summary, the proposal combines technical soundness with substantial potential. While challenges exist, such as competition with global giants, the emphasis on strategic partnerships, sustainability, and contributions to Indonesia's economic and environmental goals positions it as a promising initiative. Successful execution, regulatory compliance, and effective collaborations will be crucial to realizing the project's full potential.", there are obstacles to overcome to increase the feasibility of the project even further.

Firstly, this endeavor requires an outstanding amount of funding, which was not examined in detail originally. One proposed idea that was passed on to me while in Indonesia was the ongoing partnership with the European Investment Bank. The timing would be perfect for Hungary, as they will assume the presidency of the Council of the European Union in 2024 from July to December.⁰ With the consequent influence on branches of the European Union, an investment fund in the form of a loan seems perfectly possible as a way of funding this Hungarian venture into Indonesian energy. The EIB supports projects that make a significant contribution to growth, employment, regional cohesion and environmental sustainability, in Europe and beyond.⁰ This criteria is perfectly aligned with the goal of the Hungarian-Indonesian partnership, which is why I currently find it sufficient for our purposes.

Another important issue pointed out to me was the possibility of jobs lost with the transition to green energy, as Indonesia is one of the world's largest producers and exporters of coal. Coal mining accounts for around 6.6% of Indonesia's national GDP, making it one of the

pollution-source-sea.

⁰ Cordova, M. R. et al. (2022). Spatio-temporal variation and seasonal dynamics of stranded beach anthropogenic debris on Indonesian beach from the results of nationwide monitoring. *Marine Pollution Bulletin*, 182(2022), 114035.

⁰ European Council (2016). *Council Decision (EU) 2016/1316*, Brussels: Official Journal of the European Union.

⁰ European Investment Bank. (2024). *Frequently Asked Questions*. <https://www.eib.org/en/infocentre/faq/index.htm>

country's most important commodities.⁰ Due to its vast resources, Indonesia also has been relying heavily on coal to meet its electricity demands. The exact number of Indonesians employed in the coal sector is difficult to determine due to the lack of comprehensive data. However, estimates suggest that around 250,000 to 300,000 people are directly employed in coal mining, transportation, and power generation. This number is likely to decline in the coming years as the country transitions to cleaner energy sources. A 2020 study by the Institute for Essential Services Reform (IESR) found that there were approximately 250,000 workers directly employed in the coal mining sector, with a further 50,000 employed in coal-related industries such as transportation and power generation.⁰ This represents around 0.3% of Indonesia's total workforce. The coal sector is concentrated in a few provinces, with East Kalimantan, South Sumatra, and South Sulawesi accounting for the majority of employment.

These provinces also have some of the highest poverty rates in Indonesia, making the coal industry an important source of income for many families. As Indonesia commits to reducing its reliance on coal, there is a risk that coal workers will be left behind. The IESR study estimates that up to 30,000 jobs could be lost in the coal sector by 2030 if the country adopts a more ambitious coal phase-out target.⁰ The government has acknowledged the need to support coal workers during the transition to cleaner energy. In 2021, it announced a plan to provide vocational training and financial assistance to coal workers who lose their jobs. However, there is still a need for more comprehensive and effective plans to ensure that coal workers are not left behind as the country moves towards a greener economy.

Contrary to all this, while a general push towards a greener economy can decrease the number of total jobs available, it does provide new jobs in return, and in the circulatory economy new markets and sectors are always emerging, hopefully meaning that green ambitions will not lead to mass unemployment.

One key thing which supports the aforementioned statement is that Indonesia, despite aligning with the green agenda, has pushed back on the shutting down of its coal power plants, actually quite the opposite, as it has recently built its largest power plant yet.⁰

In recent years, Indonesia has made several commitments to reduce its reliance on coal and transition to renewable energy. In 2021, the government announced a plan to phase out coal-fired power plants by 2042, and in 2022, it signed a USD 20 billion agreement with a group of wealthy nations to support this transition. However, the government has also faced pressure from some quarters to slow down its coal phase-out, and there are concerns that it may not be able to meet its ambitious targets.⁰ In May 2023, the Indonesian government signed a deal

⁰ statista.com (2023). *Coal industry in Indonesia - statistics & facts*. <https://www.statista.com/topics/5895/coal-power-industry-in-indonesia/#topicOverview>

⁰ Institute for Essential Services Reform. (2023). *Study Launch: Just Transition in Coal-Producing Regions in Indonesia Case Study of Muara Enim Regency and Paser Regency*. <https://iesr.or.id/en/agenda-iesr/study-launch-just-transition-in-coal-producing-regions-in-indonesia-case-study-of-muara-enim-regency-and-paser-regency>

⁰ Baskoro, F. M. (2023). 30,000 Coal Workers Could Lose Jobs as Indonesia Shifts to Clean Energy. *Jakarta Globe*, 17 October 2023. <https://jakartaglobe.id/business/30000-coal-workers-could-lose-jobs-as-indonesia-shifts-to-clean-energy>.

⁰ Parker, D. (2016) Indonesia's largest coal plant will be built despite protests, minister says, *Eco-Business* <https://www.eco-business.com/news/indonesias-largest-coal-plant-will-be-built-despite-protests-minister-says/>

⁰ Harsono, N. (2022). Indonesia Waters Down Its Year-Old Ban on New Coal Power Plants. *Bloomberg*, 15 September 2022. <https://www.bloomberg.com/news/articles/2022-09-15/indonesia-waters-down-its-year-old->

with a consortium of coal-fired power plant operators to extend the operating lives of several coal-fired power plants by up to 20 years.⁰ This deal has been criticized by environmental groups, who argue that it will lock Indonesia into continued reliance on coal for years to come. However, the government has defended the deal, saying that it is necessary to ensure energy security and meet the needs of the growing Indonesian economy. It has also said that it will continue to work towards phasing out coal-fired power plants, and that the extension of the operating lives of these plants will be reviewed on a regular basis.

The debate over Indonesia's coal policy is likely to continue for some time. The government's commitment to reducing its reliance on coal is welcome, but it is crucial that this commitment is matched with concrete action. If Indonesia can successfully transition to renewable energy, it will be a major step towards tackling climate change and improving the lives of its citizens. Just recently, Indonesia working in cohesion with the Asian Development Bank, has shut down the first coal-fired power station earlier than expected⁰, which might be a sign of things to come.

8. Conclusion

A project centered around electric vehicle (EV) battery manufacturing in Indonesia presents several significant advantages that can drive economic growth, technological advancement, and sustainability. Firstly, Indonesia's abundant nickel reserves provide a strategic advantage for EV battery manufacturing. As the world shifts towards nickel-rich battery chemistries, Indonesia can leverage its resource wealth to become a key player in the global EV supply chain. This not only ensures a stable and cost-effective supply of essential battery materials but also positions Indonesia as a leader in the growing EV industry. Secondly, the domestic market potential for EVs in Indonesia is immense. With a rapidly urbanizing population, environmental concerns, and government incentives, the demand for electric vehicles is on the rise. Establishing EV battery manufacturing within the country allows Indonesia to meet this burgeoning domestic demand, driving local consumption, reducing import dependence, and creating jobs. Thirdly, government support and incentives play a pivotal role in making this project attractive. The Indonesian government has shown a strong commitment to fostering the EV and battery manufacturing industry by offering tax breaks and streamlined investment processes. This support not only encourages foreign investors but also provides a conducive environment for research and development, infrastructure development, and sustainability practices within the sector. In summary, EV battery manufacturing in Indonesia capitalizes on its nickel resources, taps into a booming domestic market, and benefits from government support. These advantages position Indonesia to become a key player in the global EV industry, fostering economic growth and environmental sustainability simultaneously.

ban-on-new-coal-power-plants?leadSource=verify%20wall&embedded-checkout=true.

⁰ Listiyorini, E., Harsono, N. & Mokhtar, F. (2023). Closing Coal Plants Proves a Hard Sell for Big Global Banks. *Bloomberg*, 15. August 2023. <https://www.bloomberg.com/news/features/2023-08-15/closing-coal-plant-early-in-indonesia-tests-climate-finance-in-asia?leadSource=verify%20wall&embedded-checkout=true>.

⁰ Jessop, S. & Lawder, D. (2023). Indonesia, ADB, owners agree to shutter first coal-fired power station early. *Reuters*, 3. December 2023. <https://www.reuters.com/business/energy/indonesia-adb-owners-agree-shutter-first-coal-fired-power-station-early-2023-12-03/>.

Investing in solar energy projects in Indonesia holds immense promise due to the country's unique geographical advantages and energy landscape. One primary advantage is the abundant solar resources Indonesia receives, thanks to its location near the equator. This geographical positioning ensures a consistent and plentiful supply of sunlight throughout the year, making solar energy a highly viable and dependable source of electricity across the nation. Solar panels efficiently capture this ample sunlight, even in remote and off-grid areas, contributing to the overall effectiveness of solar projects. Moreover, Indonesia historically relied heavily on fossil fuels, particularly coal, for its energy needs. Transitioning to solar energy offers the significant advantage of reducing this dependence on fossil fuels. This shift aligns with global efforts to combat climate change, enhance energy security, and reduce greenhouse gas emissions, all while providing a cleaner and more sustainable energy future. Additionally, solar energy projects can create employment opportunities, stimulate economic growth, and address energy access challenges, particularly in remote regions, further bolstering the case for solar energy's adoption and development in Indonesia.

Taking on such an economic project is a huge responsibility and an overly complex task, however the potential gain from the process makes it worthwhile. Indonesia is by far the most prominent member of the ASEAN and could serve as a crucial ally in the region in the future regarding both economic and political situations. Additionally, strong Hungary-Indonesia ties foster trade, investment, and cultural exchange, benefiting both nations' growth.

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Nusantara – A City For All

Anna Csontos

1. Abstract

The paper envisions a thriving partnership between Indonesia and Hungary through the Hungary-Indonesia Hub, focusing on the Nusantara project, the new capital of Indonesia. This paper details the background, analysis, and future plans of the project, emphasizing the significance of bilateral relations, technology, infrastructure, and education in fostering economic growth and sustainable development. The partnership aims to bridge economic and cultural gaps, leveraging the expertise of Hungarian companies in fields such as water management, transportation engineering, architecture, and urban planning. The initiative also outlines the educational program to strengthen future generations, promote cultural exchange, and deepen mutual understanding. Furthermore, it discusses the establishment of the business Hub in Jakarta and the relocation plan to Nusantara, emphasizing the role of the embassy and the hub in facilitating collaborations and offering a venue for networking and support. The paper also addresses the importance of sustainable principles and risk assessment as integral components of the project.

2. Vision and Mission - Introduction

In an increasingly interconnected world, the project envisions a thriving partnership between the vibrant cultures and dynamic economies of Indonesia and Hungary. At the heart of this vision stands the Hungary-Indonesia Hub, a beacon of collaboration, innovation, and mutual growth. The Hub aspires to be the catalyst that transforms economic and cultural landscape, bridging the geographic gap between the two countries.

The focus of cooperation would be on the project of Nusantara, the new capital of Indonesia. To ignite innovation by bringing together the brightest minds and boldest entrepreneurs of Hungary and Indonesia empowering future generations as well. The Hub would be the venue where knowledge is shared, and collaborative projects flourish while getting engaged with each other's culture empowering the next generation.

The project focuses on fields which include all spheres of interest in the current bilateral relations. The vital components are technology, infrastructure, and education which would strengthen diplomatic ties, cultivate cultural understanding, and create a sustainable future fostering economic prosperity.

In the following chapters the background and analysis which provide the layout of the project will be described.

3. Looking under the surface – Analysis of the Case

3.1. Nusantara - Indonesia's Flagship Project

It was first announced in 2019 that the capital city of Indonesia will be relocated to a new site in East Kalimantan on the island of Borneo. President Joko “Jokowi” Widodo outlined the numerous reasons for the need of the project⁰. However, current capital, Jakarta is central to the national economy and is a significant industrial and trading hub⁰; it faces severe issues of overpopulation, pollution, traffic congestion and subsidence.

The population grew from less than a million to 30 million in the last 70 years⁰. Jakarta, which can be found on the island of Java is suffering from serious air and water pollution which can be eased by the relocation which would allow to establish an environmentally sustainable city. Productivity and quality of life were negatively impacted by overcrowding and traffic congestions that are also consequences of the outdated layout of the city. Therefore, Indonesia's aim is to build the new capital, Nusantara designed with modern infrastructure and urban planning to alleviate these issues. As the country is an archipelago it is vulnerable to a wide range of natural disasters and environmental challenges⁰. For that reason, Nusantara is a strategic location from a security point of view and from the point of view of accessing natural resources. Redistribution of economic development was also a crucial point when deciding on the location as the balancing of the uneven growth would contribute to the living standards of inhabitants and the exploitation of abundance of potential.

Nusantara is built on a 632,850-acre site⁰. Meaning, the new capital will be four times the size of Jakarta and will present countless ambitious projects in a broad spectrum of industries. It is vital for Hungary to recognize the window of opportunities and be able to navigate among the fields of investments and joint projects which are the most suitable and favorable to both parties. Right decision-making and action taking will allow the countries to deepen their economic and diplomatic ties. Pleasant and fruitful interactions are most likely to generate long-term engagements as well as respect and understanding towards the other culture.

3.2. Open Arms – Promising Foundations

Openness with regard to trade and joint projects is promoted from both sides. A mentionable example is the Hungarian ‘Eastern Opening’ state policy between 2010 and 2015. The trajectory promoted the diversification of trade relations with the establishment of Economic Mixed Committees⁰.

⁰ Ravenscroft, T. (2023), Indonesia set to begin construction on new capital this year. [dezeen.com](https://www.dezeen.com/2023/01/27/indonesia-capital-nusantara-construction/)
<https://www.dezeen.com/2023/01/27/indonesia-capital-nusantara-construction/>

⁰ Waworoentoe, W. J. (2023), Jakarta. Encyclopedia Britannica
<https://www.britannica.com/place/Jakarta/History>

⁰ Beech, H. (2023) Welcome to Nusantara, New York Times
<https://www.nytimes.com/interactive/2023/05/16/headway/indonesia-nusantara-jakarta.html>

⁰ Legge, et al. (2023), Indonesia, Encyclopedia Britannica <https://www.britannica.com/place/Indonesia/Celebes-and-the-Moluccas>

⁰ Medina, A. F. (2022), Indonesia Passes Bill to Build New Capital City: Deadline 2024, ASEAN Briefing
<https://www.aseanbriefing.com/news/indonesia-passes-bill-to-build-new-capital-city-deadline-2024/>

⁰ Lambert, S (2018), Eastern Opening, The Orange Files <https://theorangefiles.hu/eastern-opening/#:~:text=The%20Orb%C3%A1n%20government%20pursued%20a%20stated%20policy%20of,commerce%20with%20countries%20in%20the%20East%2C%20particularly%20China>

An even more significant event took place in 2021, when Hungarian Minister of Foreign Affairs and Trade, Péter Szijjártó met Indonesian Minister of Foreign Affairs Retno Marsudi⁰. The bilateral meeting provided space for discussions on the progress of cooperation and future potential of those. The formation of an Indonesia-Hungary Investment Fund (IHIF) was decided upon. The aim of the Fund is to ensure resources for national strategic projects mainly concentrating on the fields of clean water treatment, digital infrastructure, and other public infrastructures⁰. The USD 50 million subsidized loan program already provided financial support.

The other signed agreement also included trade related steps forward, as well as expanded diplomatic capacities and increased number of Indonesian students on scholarships in Hungary⁰. Previous years of negotiations prepared relations for a heightened state of readiness considering all factors. In order to benefit from the upcoming enormous volume of constructions, Hungarian fields of interests are advised to join forces to reduce costs, eliminate the possibility of defaults and share experiences and business connections through a Hub.

3.4. Right Approach to Indonesia – Technology and Infrastructure

The constructions are estimated to cost around USD 35 billion, and the government heavily relies on the private sector to take part in the investments. In order to attract foreign investors and businesses, regulations are being finalized that offer fiscal and non-fiscal incentives⁰.

Taking into account Hungarian businesses in most cases are unable to enter foreign markets, especially in a distance like Indonesia. Oftentimes the costs of shipping, transportation, administrative issues and lack of familiarity with the other party's culture and geographical details overrule the benefits of exporting physical goods. This is also supported by the magnitude of trade exports which is the same amount as it was 10 years ago despite the efforts of the 'Eastern Opening'⁰.

On the other hand, there have been precedents from recent years when Hungary was successfully able to win tenders and invest in the field of technology and digitalization. These bilateral agreements set an example for Hungarian companies. Retrieving and exploiting sectoral opportunities that are saturated with Hungarian expertise while at the same time building on the foundations of national presence which have already been laid out.

Sectoral recommendations of the project are based on Hungarian competencies, Indonesian demand (with respect to avoid hardships in Jakarta) and in recent years previously penetrated markets.

⁰ Editorial Team, (2021), Indonesia – Hungary Investment Fund: What Is It?, Dinsights <https://dinsights.katadata.co.id/read/2021/02/17/indonesia-hungary-investment-fund-what-is-it>

⁰ Indonesia Window, (2021), Indonesia, Hungary agree to form joint investment fund, <https://indonesiawindow.com/en/indonesia-hungary-agree-to-form-joint-investment-fund/>

⁰ About Hungary, (2020), FM: Hungary and Indonesia to set up USD 500 million investment fund, <https://abouthungary.hu/news-in-brief/fm-hungary-and-indonesia-to-set-up-usd-500-million-investment-fund>

⁰ Medina, A. F. (2022), Indonesia Passes Bill to Build New Capital City: Deadline 2024, ASEAN Briefing <https://www.aseanbriefing.com/news/indonesia-passes-bill-to-build-new-capital-city-deadline-2024/>

⁰ Mészáros, T. R. (2021), As Hungary lauds its 'Eastern Opening' policy, statistics fail to show benefits, Telex <https://telex.hu/english/2021/05/07/eastern-opening-viktor-orban-peter-szijjarto-trade-investment-china-hungary-eu-dependence>

In conclusion, the focus should be on the following critical areas to ensure success and sustainability throughout the construction of the new capital: infrastructure development, urban planning, environmental sustainability, and transportation connectivity. Silvia Halim, head of infrastructure of Nusantara claimed that they keep themselves open to new ideas considering they want the capital city to become the best possible. The next section of the project will elaborate on the benefits and details of the Hub to offer a fundamental solution to carry out Hungarian-Indonesian projects the most effective way as possible.

4. Hub – 1st Pillar

4.1. Safe space – Being a Home to Hungarian Businesses

Among the two pillars of the project, the first one is that creates a framework for the other. The business Hub (term already indicated) refers to a central office in Jakarta in close proximity to the embassy, serving as a focal point for Hungarian business activities involved in the Nusantara project. It facilitates all innovation, research and development and network needs that are required to succeed in Indonesia as market entrants. The Hub will be able to offer a wide range of services, such as market research and analysis, business matching, investment promotion, tender identification, legal and regulatory guidance, networking and events, visa and immigration support, cultural and language support, information and data sources and project management.

Companies and experts participating in the Nusantara project would greatly benefit , in terms of cost and business success. The latter highly depends on exploiting the network of contacts. Indonesian businesses like to know who they are cooperating with and often at seed stage they like to look at the founder's life. Space and opportunity are needed for the acquaintance to happen.

The embassy often played a big role in the past, especially when they implemented the 36 water purifier and few years ago in the case of ROATEX Zrt. For that reason, it is recommended to move the Hub to Jakarta at first until the execution plans and contracts are dealt with.

4.2. Profile and Offered Services

Main profile of the hub is facilitating business ideas and help Hungarian companies adequately conduct their negotiations then successfully carry out the transfer/engineering works/constructions. What is crucial to mention is that the embassy (ambassador Karsai Lilla) would play a huge role and work in close proximity with the hub. Therefore, the recruitment of suitable workforce must be initiated as soon as possible to fill the needs of the two establishments.

4.3. Scenarios – Execution of Hub

Self-explanatory businesses which decide to open their own branches, offices in Indonesia would not be in the position to exploit all services the hub has to offer, however initial support and operational help will be needed when they are entering the foreign Indonesian market. Legal security and embassy support would also accompany this less engaged cooperation. All in all, companies are expected to get in touch to a certain extent.

As constructions go ahead and plans of Hungarian business projects would be initiating the implementation period it is more than probable that physical presence will be required in Nusantara. The timing of the partial relocation of the hub is unpredictable at the moment due to the delays in the Nusantara project (because of COVID-19). The date and the pace depend on the success and volume of Hungarian projects. It is certain that the hub and the embassy will be gradually moved to Nusantara until 2045 (end of new capital city project).

At the end of the constructions the hub moved to Nusantara and would belong fully to the Hungarian Embassy, which will (anyway) need the upscaling of labor with regard to the economic and population boom of Indonesia and its highly increased economic significance in the world.

4.4. Groundbreaking ideas – Technological transfer from Hungary

4.4.1. Water Management

Access to water and sanitation is not given everywhere. Sustainable water resource management became one of the most significant issues of Indonesia. Water diplomacy has been Hungary's one of top priorities and in recent past Indonesia also got a testimony from that⁰. The fruitful cooperation allows Hungarian companies to build on this already gained trust and take advantage of their expertise in the field. Nusantara and its surroundings are not yet equipped with such high technology as the environment mostly contains villages at the moment.

4.4.2. Transportation Engineering

Hungary also had a technological transfer on this field and taking into consideration Indonesian current situation. According to Keszthelyi Attila and Orosz Gyula former CEO of ROATEX, it can occur that 50-kilometer-long lines of vehicles are standing in a queue or people die while travelling by car. There is a lot that can be improved in the field and not exclusively the toll system. For example, Hungarian transportation start-up SHOKA, offers a mobile application and a smart bicycle gadget called SHOKA Bell which among others warns cyclists if they are getting close to a dangerous road section⁰.

4.4.3. Architecture (sport and recreational) and urban planning

Architects are responsible for designing the buildings and structures in the city, ensuring they are functional, aesthetically pleasing, and compliant with local building codes. This division stands out somewhat from the rest, given the lack of exchanged technology.

Sports are playing a substantial role in Indonesia and the number of events being hosted in the country grows rapidly. While in 2017 they gave place to 3 relevant championships and cups, in 2023 the number of them increased to 16. Most of them were held in Jakarta and the majority were of international scale. It is self-explanatory that as a result of the sinking island, these major events attracting significant number of visitors will be relocated to East Kalimantan.

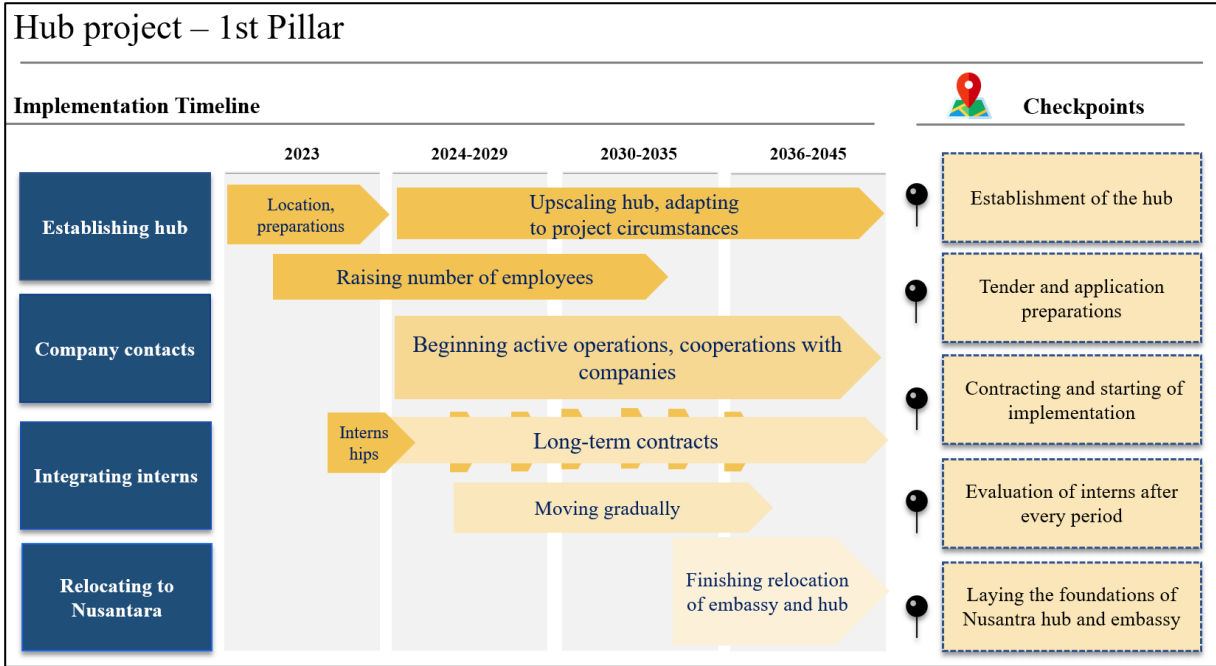
Although constructions have started but it is primarily focused on residential and governmental institutions in this first period. The overall works will last until 2045.

⁰ OECD (2022) Hungary's water diplomacy harnesses international action, <https://www.oecd.org/development-cooperation-learning/practices/hungary-s-water-diplomacy-harnesses-international-action-4c561d9b/>

⁰ SHOKA, (2017) CrunchBase <https://www.crunchbase.com/organization/shoka-me>

Consequently, projects and designs on sport facilities remained to be earned. From the case of ROATEX, Indonesians value proactive proposals and preparing the feasibility plan of the draft led to the winning of the tender. Besides, Hungary proved its competence in 2023 by executing the construction of the hosting stadium of the World Athletics Championship (WA) with 35 000 seats. The contractors and the architect, Ferencz Marcell paid special attention to align with WA sustainability strategy launched in 2020⁰. This is only one example of sport architecture among many recently built facilities.

4.5. Timeline of 1st Pillar



Source: own figure

5. Internship – 2nd Pillar

5.1. Generations of the Future – Essentiality of Education

Solely economic strings make businesses harder to conduct and a self-interest-based attitude prevents long-lasting cooperation. Systematic opening towards each other’s culture and values should always accompany bilateral relations. Mutual progress in technology should go hand in hand with mutual positive impacts on one’s society.

Education is the backbone of every society and plays crucial role in the country’s economy, politics, and welfare. The country is experiencing a demographic peak and is the 4th most populous country in the world. The education system is under an ongoing development, however only 10% speak English.

In case of Nusantara, it is crucial to provide adequate workforce, not only in quantitative terms but in qualitative as well. Indonesia often lacks intellectual capital due to the uneven development of its regions. The absence of that component could result in delays or even mistakes. Studies estimate that by 2030, 70% of the population’s adults will be in working-

⁰StadiumDB, (2023) Nemzeti Atlétikai Központ, http://stadiumdb.com/constructions/hun/nemzeti_atletikai_kozpont

age⁰. The Indonesian younger generation should get acquainted with the technologies implemented in the new capital city.

This study suggests an educational program which would deepen bilateral, especially cultural relations at the same time. Recent graduates would be able to facilitate work between Nusantara project participants while strengthening future generations of Indonesia. Moreover, students involved in the project will be equipped with great knowledge of Hungary and nourish good business and cultural relations with them.

5.2. Something Old, Something New – Using Laid Foundations

The execution of this program involves already existing university scholarship programs. Connecting them to specific vocational fields allows a direct way to gain experience in practice. It would ensure Hungarian as well as Indonesian students to be able to participate.

Hungaricum Stipendium is a government scholarship which provides full financial support to selected students providing a wide range of study programs and vocational training. In 2021, after the investment decision was on the e-toll system, Hungarian minister of foreign affairs Szijjártó Péter highlighted the expanded interest of Indonesian (1200) students to study at Hungarian higher education and expressed his intentions on increased scholarship numbers offered. At that time 13 Hungarian institutions were in cooperation with 23 Indonesian universities⁰.

It is an exceptional occasion to gain cultural and vocational experience by learning the basis of Hungarian language and habits which could later be useful in business and professional life. Hungaricum Stipendium courses are often linked to post-graduation opportunities and/or mandatory practical experience or internships. These two opportunities would be taken advantage of throughout the duration of the project. Indonesian students would have the opportunity to get their internship or mandatory practice at one of the businesses working on the constructions of Nusantara. The earlier mentioned ROATEX Zrt. also employed local support when they transferred their toll road technology. During the planning and implementation process, it is inevitable to involve Indonesian expertise⁰. It would be a strategic decision to draw in students and equip them with the knowledge and know-how the technologies have to offer, beforehand the technology transfer happens.

Their earlier integration would also contribute to a better facilitation of the systems and arming with the ability to negotiate in a more effective and sympathetic way when it comes to arrangements with the authority.

Taking a look at the other direction of scholarship engagements, Hungarian students are to be granted places at Indonesian Universities. The already existing platform for that is Darmasiswa and KNB Scholarship. However, a mentionable program called KADIN was just founded in recent years by the Indonesian Chamber of Commerce and Industry which started to cooperate with numerous local universities to strengthen vocational training funded by

⁰ Dilas, D. et al. (2019) Education in Indonesia, WENR <https://wenr.wes.org/2019/03/education-in-indonesia-2>

⁰ About Hungary, (2020), FM: Hungary and Indonesia to set up USD 500 million investment fund, <https://abouthungary.hu/news-in-brief/fm-hungary-and-indonesia-to-set-up-usd-500-million-investment-fund>

⁰ Cindyara, A. (2021) Hungary welcomes selection of ROATEX for Indonesian e-toll project, AntaraNews <https://en.antaranews.com/news/167019/hungary-welcomes-selection-of-roatex-for-indonesian-e-toll-project>

industry sectors⁰. This program helps students get in touch with local businesses and institutions. For Hungarians, it would be a great opportunity to get into the circulation of Indonesian university circulation. The majors which could be long-lasting assets for the Nusantara project would be international relations, strategic studies, business administration and so on.

To be specific, after graduation internship spots would be offered to the most promising applicants in accordance with the required number of people per project. These commitments would last only half a year to align with mandatory practice conditions. On the other hand, the aim is to find long-term colleagues and until the joint work lasts, parties can determine whether they would like to continue or elongate the employment status of the freshly graduated party. After the trial training phase, Indonesian students enter a full-time employment with the adequate contract. As soon as the implementation phase of the technological systems ends, and the constructions and engineering works are finished the earlier integrated Indonesian workforce will be charged with managing and monitoring the systems. This way the invested knowledge and cooperation can circulate back to society, involving more and more young adults.

In case of the Hungarian students who received education in Indonesia, they are more likely to be appointed to handle operational and organizational processes. Employees of the hub and the embassy would be filled up with them in this time period (2023-c.2045) with special attention to the increased need of the workforce to manage intensified diplomatic and business interactions. By being already acquainted with Indonesian language, their intentions of getting deeper involved in the bilateral relations would find open doors. After the Nusantara project the generational change of the embassy workers would most probably happen. This way, the mandates were passed on in a way that long-term personal networks could benefit from.

5.3. Future of the Students at the Hub

Indonesian and Hungarian students who were chosen to join the project of the Hungarian companies would be assisted and guided by the hub. The hub would serve as an allocation center and a venue to allow fellow participants to cross each other's paths and help to promote each other's activities and navigation on the new market surrounded by plenty of opportunities. Administration of the hub and the embassy would hand in hand handle the visas, employment contracts, taxation obligations, housing and accommodation.

By gradually relocating the embassy and the hub during the project this exercise would not be a burden anymore. Moreover, the workforce and the physical belongings (plant & equipment etc.) of the hub would not go to waste as it would merge into the embassy by 2045. Heightened capacities will be needed by that time as the new capital will be four times the size of the previous one and all major institutions and residents will be relocated and settled by then.

5.4. Synergies and Benefits

Practical experiences are valuable as they allow students to apply theoretical knowledge in real-world settings. Being a part of the constructions of the Nusantara grants a life-changing experience and honor to be able to contribute to historical events.

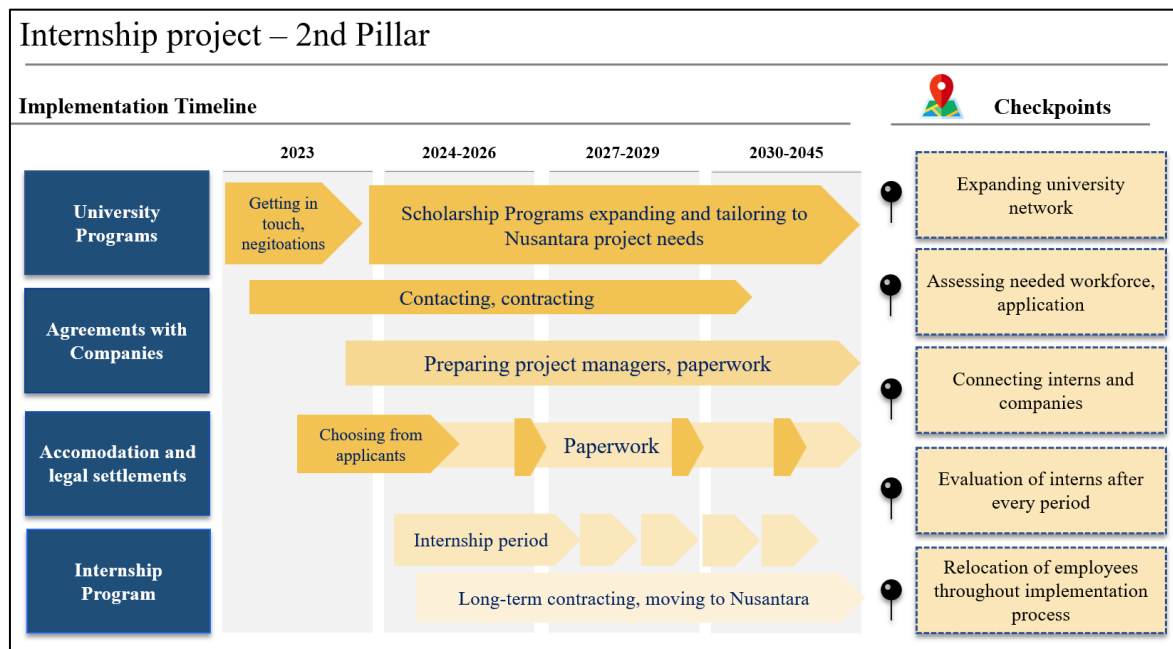
⁰ Hadi, A. (2023) Kadin partners with local universities to improve vocational education, The Jakarta Post <https://www.thejakartapost.com/business/2023/03/07/kadin-partners-with-local-universities-to-improve-vocational-education.html>

From the side of Indonesians, it is an additional field of control over the undergoing changes in their country making them less vulnerable to foreign capital and investments. Additionally, students get to expand networks as part of an international community and can secure of lifelong professional connections with Hungarians.

For Hungarian companies inviting Indonesian interns and for the embassy and the Hub to employ interns, there is much benefit that lies underneath. They would gain access to an especially committed workforce who would receive salaries based on their internship status at first. Taking into consideration that they spend their first time on the job market and in work life, they are more likely to be easily shaped to the task. Interns would be prepared exactly for this project and to work with people from the exact other culture already aware of the details of Nusantara constructions. Furthermore, companies would not have to be bothered by that much paperwork and administration as these processes would be standardized and counted as routine errands by the Hub saving many extra costs.

Students of Hungary would also enjoy the same advantages of the project involvement and know-how dumps. The country would be able to put its ‘Eastern Opening’ intentions into practice with strings so close that would serve as the cornerstones of many future cooperations. The costs of the hub would not be wasted given the prospects of Nusantara's project. Furthermore, its geographical proximity makes it easy to shift its focus in the case of further cooperations with neighboring Asian countries.

5.5. Timeline of 2nd Pillar



Source: own figure

Time will Tell - Future Plans

As plans turn into reality sooner or later, the sectoral strengths of the Hungarian side and the needs of the Nusantara project will emerge. These lessons can be used to formulate the details of this current project’s specializations and the temporal and spatial details of the relocation of the hub. Possible areas of future cooperations can also lie in medical technology, fintech, digitalization, waste management, digital economy and many others.

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Another opportunity that lies in the project is expanding the scope of technological installments such as the water management system to other (possibly less developed) areas of Indonesia. Standardizing the use of technology across national borders would save a lot of costs and ease of use.

6. Feedback from Indonesia

Fortunately, I got accepted to a study trip to Indonesia, as a result of my written project work. The study trip was supported by the Mathias Corvinus Collegium. The two main stops were Jakarta and Yogyakarta.

Although the trip did not include Nusantara, I was able to receive many valuable feedback from think tanks, university professors, students, members of the Chamber of Commerce, colleagues of the Ministry of Foreign Affairs and many others. I found the trip extremely useful for the reason that I was able to initiate dialogues on my project with many parties, gaining many viewpoints.

The overall expression of mine was, that people of Indonesia are highly engaged in the Nusantara Project and individuals contacted me later on how they wanted to get to know my whole study and the inspiration behind it. An employee requested to receive my paper as their whole community is utterly excited regarding the constructions and new ideas approaching developmental solutions. Especially valuable feedback I received, was from a student attending the Islamic University of Indonesia. The advice was fully aligned with the recommendation given by the Chamber of Commerce: a deeper focus on sustainable and environmentally friendly solutions provided by Hungarian companies. In acceptance of these guidelines the following chapter will elaborate on the importance and possible execution methods.

6.1. Code word: Green – Sustainable Principles of Nusantara

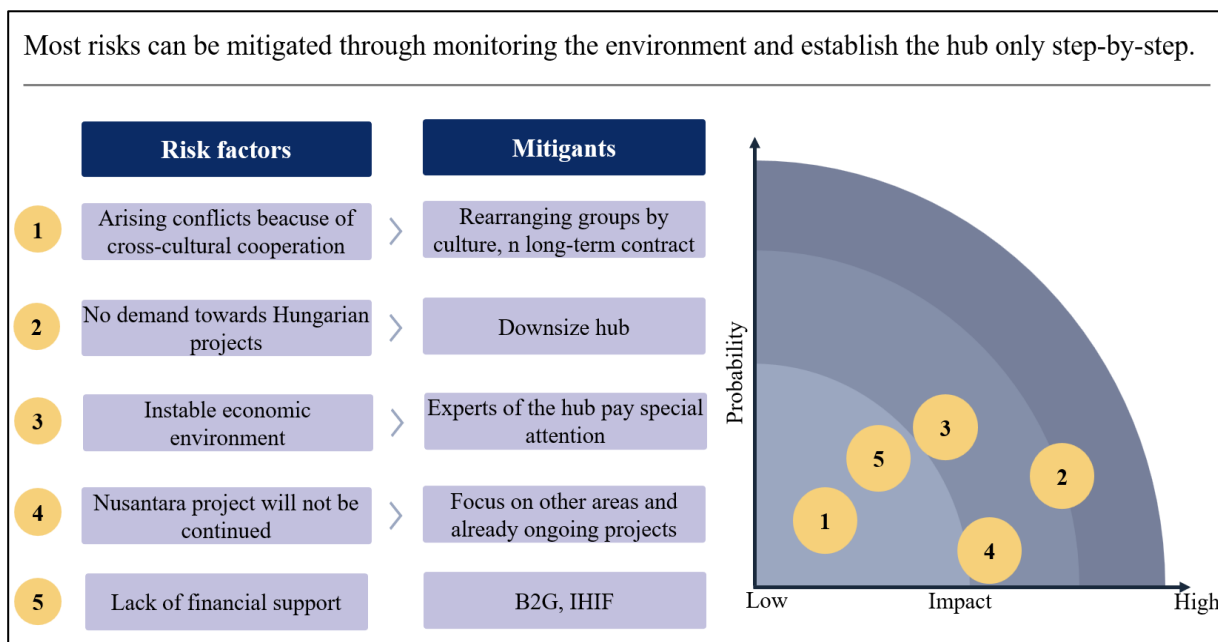
The Nusantara Project is Indonesia's ambitious plan to build a green and smart city. The project aims to reserve 70% of the new capital as green areas and ensure environmental sustainability. The government plans to develop basic infrastructure, green and blue areas of the city, government complexes, offices, and housing, along with their facilities and infrastructure. The project envisions Nusantara as a forest city since Kalimantan is a large area in what is known as the Heart of Borneo —rain forests that serve as the “lungs of the earth”. The government conducted a strategic environmental study, which recommends restoring tropical rainforest ecosystems as one of five roadmaps for environmental recovery and improvement.

It is advised for businesses to apply to the project with technologies and solutions that are environmentally and eco-friendly, as the whole project's key principle is to ensure environmental sustainability. The Asian Development Bank (ADB) has pledged to help Indonesia plan its new capital as a carbon-neutral and inclusive city. The ADB will help the Nusantara National Capital Authority (NNCA) design the new city, assess its potential environmental and social impacts, and mobilize financing from public and private sectors to support the city's development. The government also envisions Nusantara as a smart city, and the latest technology will be applied to the development of Nusantara as part of the country's 100 Smart Cities initiative.

Therefore, it is proposed that besides the earlier mentioned fields of potential cooperation, the Hub should keep a close eye on solutions serving green investors' and project managers' expectations.

7. Risk Assessment

As every investment and every project initiation comes with risk, this is no exception of that. These have been assessed by severity and probability of occurrence by the below displayed coordinate-system which also offers mitigation recommendations. The collection of risks is based on Indonesian political, economic, social, technological, environmental, and legal aspects.



Source: own analysis and figure

8. Conclusion

To conclude all that have been stated so far, the proposed project involves a 2-pillar strategy to dive deeper into Indonesian-Hungarian economic and cultural relations by cooperating on the ambitious project of the new capital Nusantara. For Hungary, it would be a big honor to be able to actively take part in the constructions and finally facilitating the “Eastern Opening” with these bigger steps. Indonesia is globally one of the most promising countries, however in order to win the war with environmental extremes it needs capital to relocate in time.

The two countries have been slowly but steadily approaching each other but this joint project would ensure a long-lasting and unique bond between them. By debunking the gravity model of world trade and disproving misconceptions, it is possible to build a closer relationship with a more innovative approach based on technology and innovation.

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Hungarian diplomatic initiative: Yogyakarta - the province and its potential

Emese Zsófia Nyúl

1. Abstract

Yogyakarta, the second smallest province of Indonesia, is striving to become a Smart City through a partnership with Hungary. This partnership aims to enhance various aspects of the city, such as sustainable transportation, digital infrastructure, talent management, and smart governance. A key component of this collaboration is a student exchange program involving Hungarian and Indonesian universities. The exchange program focuses on IT and digital technology, enabling students to engage in research and development activities. Additionally, the establishment of a sister city relationship with Zalaegerszeg and the improvement of tourism through cultural exchange initiatives are integral parts of this project. Furthermore, the Smart City initiative seeks to address challenges such as traffic control, infrastructure development, and sustainability. The initiative emphasizes the need for smart governance, smart infrastructure, and the expansion of the student exchange program to foster cultural exploration and knowledge sharing. Ultimately, by leveraging the strengths and expertise of both countries, this partnership aims to promote economic development, cultural exchange, and sustainable urban living in Yogyakarta.

2. Introduction

Yogyakarta is the second smallest province of Indonesia, located on the island of Java. There are more than 120 higher education institutions in the city, thanks to which tourism and educational institutions determine the city's economy. Yogyakarta is mainly a tourist and student city, and the population alongside the population density are increasing every year. Based on the statement of Indonesia's Minister of Communications and Information, the Smart City initiative is a concept that focuses on improving the quality of life and making the city more sustainable. According to the released announcement, the city of Yogyakarta would be responsible for the development of the digital economy of the whole of Indonesia⁰.

The Indonesian government is planning to establish a talent management centre, for which it is envisioning cooperation with 4 higher education institutions. According to the diplomatic cooperation, Hungary would provide financial support for the development of the talent centre, and the Stipendium Hungaricum scholarship program would be extended between several universities in Hungary and the universities in Yogyakarta. Under all of this, an exchange student program would be established between the Budapest University of Technology and Economics, the Zalaegerszeg campus of Pannon University and the University of Szeged. During the exchange student program, Hungarian students dealing with

⁰ Antara News, (2023), Yogyakarta jadi percontohan "smart province" <https://www.antaranews.com/berita/3631740/yogyakarta-jadi-percontohan-smart-province>

digitization and artificial intelligence can conduct research and create new technologies at the Talent Center, and the results and developments could then be used for the development of Hungarian higher education.

To develop Yogyakarta into a Smart City, it is essential to make transportation more sustainable. The application of the concept is justified by social phenomena such as the increase in the number of the population and population density, and the number of passenger cars on the roads has also increased proportionally, the rapid change in land use, and the decrease in interest in public transport.⁰ Within the framework of the exchange student program, Indonesian students can research and learn about environmentally friendly transport technologies at the Budapest University of Technology and Economics, the University of Szeged and the University of Pannonia, and the test track in Zalaegerszeg provides an excellent opportunity for all of this.

To make transport more sustainable, the development of digital infrastructure is also essential, including the expansion of high-speed Internet access and the development of a city-wide network. In the Indonesian-Hungarian relationship, one of the priority areas of Hungarian economic involvement is information technology and telecommunications, within the framework of the project, Hungarian developers and companies can take a role in the development of the digital infrastructure. In addition, technological transfers from the Hungarian side, as well as innovative city management methods, could help to make transport in the city simpler and more environmentally friendly to make transport more sustainable.

3. Student exchange program

Hungary is a country of inventors, it carries out pioneering developments in the field of IT. Within the framework of the exchange student program, Hungary would provide financial support for the development of the IT laboratory of the Talent Program, as well as support research and the work of researchers.

During the program, talented Hungarian students would complete a professional internship at the Talent Center. Students from the Budapest University of Technology and Economics and the University of Szeged can apply for the internship from IT and electrical engineering faculties in Hungary. With research, university students can contribute to the development of information technology and telecommunications, as well as to the implementation of new research in the field of artificial intelligence.

3.1. Importance of the student-exchange relationship

Indonesia has taken huge steps in the field of digitization, following India and China in the Asian region, it is developing on a large scale. The knowledge of Hungarian students and development engineers is also competitive at the international level, which is why the international exchange of experience is mutually beneficial for both parties. This would be a unique opportunity for Hungary to create a more advantageous position in the digitization competition, even among European countries. Such knowledge and experience may be

⁰ Khairina, E., et. al, (2022), Smart City in the Special Region of Yogyakarta: Development of Transportation Through a Sustainable Approach, Atlantis Press <https://www.atlantis-pess.com/proceedings/iconpo-21/125970945>

available through which Hungary can become a decisive player in the region. Indonesia has gained significant experience in the field of technology in recent years,⁰ their strategy is completely different from the Hungarian approach, during a collaboration Hungarian students could gain this knowledge first-hand. In the digital age, Indonesia is thriving - offering potential lessons for other countries in a similar starting position. Indonesia has created its own multi-billion dollar tech platforms, a homegrown "super app" and numerous tech startups. It has one of the fastest-growing e-commerce markets in the world, on track to reach USD 360 billion⁰ by 2030. According to one estimate, Indonesia ranks sixth in the world for the number of start-ups. Indonesia has also used digitalization to accelerate inclusive development, reaching the poor through more targeted social assistance, national identification programs and financial services.

In the framework of the Darmasiswa scholarship program launched by Indonesia, IT students from the University of Yogyakarta can study at the Budapest University of Technology and Economics and the University of Szeged. A research group dealing with artificial intelligence of the University of Szeged's Faculty of Informatics, together with the Hungarian Academy of Sciences, carries out active research and teaching tasks in the fields of artificial intelligence and several general computer sciences. This group would also be available to Indonesian students. Students studying automotive mechatronics at the University of Yogyakarta can do a professional internship at the ZalaZone Park on the Zalaegerszeg campus of Pannon University as part of the exchange student program. On the test track, they can conduct research on sustainable and environmentally friendly urban transport, as well as the development of hybrid and environmentally friendly electronic vehicles.

3.2. The Indonesian students' perspective

Zalaegerszeg test track 5G Mobile technology is connected to the city's green future vision, a mobile technology teamwork would promote the development of the digital infrastructure of both cities. 5G technology is integrally connected to the infrastructure of the test track and the self-driving cars tested on it. On the one hand, 5G technology is an evolutionary development of 4G and 3G mobile technologies, and as a result, higher download speeds are possible and newer mobile services are available.⁰ On the other hand, 5G technology will also include many revolutionary changes that the changing environment requires. The express focus area of the park is to provide a competitive environment for testing, validation, and modern technologies and research and development. Among the most important foreign partners are the Massachusetts Institute of Technology (MIT) in the United States, the Polish Institute of Motor Vehicles, the technical universities of Vienna, Graz, Cluj and Brno, as well as the Transylvanian University of Brasov. It represents an invaluable opportunity for Indonesian students to acquire knowledge from all these relationships, and they would also have unlimited access to one of the most modern test tracks in Europe. They can conduct research in areas such as electromobility, machine learning, environmental perception, robotics, vehicle simulation, self-driving vehicle control, telecommunications, and smart transportation systems. In addition to student talent management, research engineers support young talents as mentors. They can apply the acquired knowledge to the development of Yogyakarta into a Smart City, they can get closer to ensuring that the transport of the future is uncompromising,

⁰ Szakáli, M. (2023), Indonézia és a BRICS-tagság, Eurasia Center <https://eurasiacenter.hu/2023/08/10/indonezia-es-a-brics-tagsag/>

⁰ Palaon, H. (2023), Indonesia's digital success deserves more attention, The Interpreter <https://www.lowyinstitute.org/the-interpreter/indonesia-s-digital-success-deserves-more-attention>

⁰ The Zalazone Project, (2023), Smart City Zone, <https://project.zalazone.hu/buildings/smart-city-zone/>

safe, simple and sustainable. Upon returning home, Indonesians who studied in Hungary can provide Hungarian companies with an extremely useful service, since as local representatives they represent great potential in strengthening bilateral relations.

4. Sister city relationship

The city of Zalaegerszeg also strives to become a Smart City, making huge efforts to make its traffic more sustainable and environmentally friendly. One alternative to all these endeavours is the promotion of electric vehicles and the development of telecommunications. That is why, within the framework of the project, Zalaegerszeg and Yogyakarta would benefit from both sides if they became sister cities. This would promote transport development efforts and the spread of environmentally friendly vehicles, and would also promote the strengthening of cultural relations between the two countries. By becoming a sister city, the success of the exchange student program would be more guaranteed, thereby making research and development more efficient.

Hyundai Motors Indonesia is expanding its network of charging stations for electric vehicles in Yogyakarta, thereby increasing interest in electric cars and promoting sustainable transportation. The initiative, that a sister city relationship with Zalaegerszeg with a modern test track reflects the role in creating a better and greener future. Through the cooperation of the two cities, city leaders can find a competitive edge in the field of technological development in terms of special expertise, location and connection.

5. Tourism

The establishment of exchange student programs and the sister city relationship will help boost tourism in both directions. Through the exchange programs, in addition to research work and cultural study trips, we enable speakers, artists, musicians and other cultural representatives of both countries to participate in cultural events, gallery exhibitions and performances in both Hungary and Indonesia. Domestic tourists account for 80% of Yogyakarta's tourism, while in the case of another island, Bali, 80% of tourists are foreigners. The city is a cultural jewel box, known for its traditional Javanese arts, dance and music. Yogyakarta strives to become a more attractive tourist destination and also tries to establish closer tourism cooperation with Hungary. Within the framework of the exchange student program, the Hungarian and Indonesian governments make an agreement that the program participants and their close relatives will receive a simplified visa processing procedure, thus allowing them to discover the cultural heritage, traditions and history of the other country. The boom in tourism is beneficial for the economies of both countries. As part of the project, we welcome artists from Yogyakarta to festivals in Hungary, thereby promoting the city, while cultural events and student festivals in Yogyakarta host Hungarian artists, performers, and dancers who can introduce Hungarian culture to the Indonesian audience. In this way, we can attract the attention of the population, and there is a greater chance that both Yogyakarta and Hungary will become an attractive destination for tourists.

6. Smart Governance

Yogyakarta is working to become a Smart City. A Smart City is a strategy to enable cities to adapt to socio-economic changes through information and communication technology functions. A Smart City uses technology and data to improve the quality of life for its residents, improve efficiency in various sectors, and promote sustainable urban development.

This includes Smart Governance, through which the city government has digitized administrative processes, allowing residents to access government services online. This includes services related to permits, taxes and public information. In the course of the Hungarian-Indonesian diplomatic cooperation, Hungary had previously provided information technology and telecommunications to the Indonesian side. Therefore, Hungary has already proven itself in this field and is a reliable partner in the development of telecommunications data management software, security software and e-taxation software. According to the other part of the project, Hungarian IT companies could design and develop the digitalization administration of the city of Yogyakarta. The implementation of the project contributes to the achievement of the government's strategic goal of digital export development, that the domestic IT sector contributes significantly to the intensive export growth of the country's high-added value digital products and the expansion of the national economy. Hungarian knowledge is internationally recognized, and the development of Yogyakarta's administrative infrastructure would be another success of competitive domestic technologies.

7. Smart infrastructure development

Due to the growing population, accelerated urbanization and underdeveloped infrastructure, the topic of water management and waste management is of particular importance in Indonesia. There are already several Hungarian water-related companies in Indonesia, thanks to which our water-related expertise is already widely known, and Budapest Waterworks has already played a role in infrastructure development in Indonesia with its innovative technologies.

In terms of sustainability, long-term solutions such as Smart water use and wastewater utilization are necessary. The long-term development of the water infrastructure includes the replacement of water uses that do not require drinking water quality with rainwater and/or the use of grey wastewater (water used for washing). Within the framework of the project, Budapest Waterworks would redesign the water infrastructure of the city of Yogyakarta within the framework of an aid loan program, thus making the city more sustainable, the Hungarian side has already proven its reliability in this part of the technology transfer⁰. Instead of the extensive sewer network and the central wastewater treatment plant, the goal is to create more decentralized, local, and energy-efficient systems.

We offer the Indonesian side that Indonesian students from a university in Yogyakarta can come to study or do a professional internship at the Faculty of Water Sciences of the National Public Service University in Baja. Students get to know the most important elements of municipal water management, water acquisition opportunities, water and wastewater treatment technologies, and learn the efficient operation of water utility systems. Students who choose the specialisation also acquire measurement technology knowledge during the training. They can prove their practical skills in the water technology-hydroecology measurement exercise. Students of the National University of Public Service can go on a study trip to Indonesia, where they can learn more about freshwater aquaculture and take part in a professional internship as a unique opportunity.

⁰ MTI, (2015), Magyar cég biztosítja Indonézia vízellátását, Magyar Nemzet <https://magyarnemzet.hu/gazdasag-archivum/2015/06/magyar-ceg-biztositja-indonezia-vizellatasat>

8. Smart traffic control

This is an important point. because from a sustainability point of view, an important aspect is how the city can make its traffic more transparent. Yogyakarta has traffic problems in the transport sector, the high number of vehicles is disproportionate to the amount of roads and this results in congestion. Air pollution increases due to congestion, which does not have a good effect on the quality of life. Hungary could help solve the problem by providing technology transfer. Hungarian IT companies would redesign and develop a smart traffic control system. The introduction of the Smart traffic-dependent signal light system, which can take into account the traffic and capacity of the given road sections and dynamically control the traffic accordingly. The Smart solution can also be extended to the priority of certain vehicles and their corresponding traffic control (e.g. ensuring the priority of electric vehicles with dynamic traffic control lamps). With an application specially developed for this purpose, the transport system can be made more efficient, sustainable and safer. Smart transport systems provide travellers with real-time information about traffic conditions, public transport schedules and available routes. This helps people make informed decisions and avoid delays. Smart signals could adjust timing based on current traffic conditions to reduce congestion, and would also include features that would allow passengers to track arrivals and departures in real-time thanks to digital signage at bus stops and train stations. It is important to mention the smart parking solution, which can help a lot in the development of the city into a Smart City. Sensors in parking lots inform drivers of available spaces and even enable cashless payments via mobile apps. This reduces the time and fuel spent searching for parking, thereby reducing air pollution and congestion. Smart transportation systems enable faster response times in emergencies by providing real-time information to emergency services and rerouting traffic when necessary. Transportation agencies can analyze the data to gain insights into traffic patterns, user behaviour, and infrastructure performance. This information is used to make informed decisions about system development. Smart transport systems may include features that allow users to provide feedback or report problems, helping authorities to solve problems and improve services. Smart transportation aims to provide accessible opportunities for all members of the community, including people with disabilities so that everyone can benefit from the improvements. Overall, smart transportation plays a critical role in creating more efficient, sustainable, and livable cities, benefiting residents, businesses, and the environment.

Hungary has already taken a role in infrastructure development, the largest Hungarian technological export was realized by being able to build and then operate the Indonesian highway toll collection system.⁰ In addition to traffic regulation, the development of energy-saving public lighting can be a huge step forward in making the city more sustainable. With Hungarian-Indonesian collaboration, the MVM Energetics Group will create and develop an energy-efficient public lighting system in the city. On the one hand, this means energy-efficient lighting, with better optics, more concentrated lighting and light closer to the spectrum of sunlight. On the other hand, the operation of public lighting fixtures can be more diverse by the built-in smart control. The luminous flux of the luminaires can be regulated, it can also be made suitable for serving locally changing lighting needs, more economical lighting can be set for night traffic conditions, and central monitoring can be built to monitor the condition and consumption of the lamps, the colour image temperature can be optimised to create better visibility conditions. With the development of public lighting, public safety

⁰ Domány, A. (2021), Magyar kormánybiztos segíti az indonéz elektronikus útdíjhálózat kiépítését, HVG https://hvg.hu/kkv/20211014_indonezia_utdijhalozat_kormanybiztos

would be improved, and the number of crimes committed in public spaces would decrease, thereby improving the quality of life.

9. Project improvements through personal experience

Yogyakarta faces many challenges: the poor quality of the road network, contaminated drinking water, and the lack of public lighting significantly reduce the standard of living. Due to the quality of the roads, traffic is also more prone to accidents, and sustainable transport is not possible at the moment. As a first step, the quality of the roads should be improved and safe pedestrian and bicycle lanes should be created. Cycling is also not popular among young people, as it is hazardous for accidents and, considering the distances in the city, it makes transportation particularly time-consuming, which is why young people buy scooters or small motorcycles first. Most of the public transport means are outdated, polluting several decades-old vehicles. The introduction of green, hybrid vehicles is difficult not only because of the size of the budget but also because of the quality of the road network: new vehicles would quickly break down, and because of the lack of charging stations. So, to develop sustainable transport, the first step should be to fix the roads and create a more structured road network. Unlike big European cities, Yogyakarta has many wider streets, where you can easily create several lanes and a safe bicycle lane, among other things.

From an environmental point of view, it does not entail a significant burden, but the training and employment of social workers is a socially useful form of employment. People doing this type of work can greatly contribute to making individual settlements more livable, as they are a link with the outside world for those in need. This activity, if carried out well, strengthens the fabric of local society, and protects and re-integrates into society those who can no longer participate in society independently, or find it difficult to provide for themselves. Another important possibility is that they can pass on everyday practical knowledge to those they visit, so they can effectively spread the knowledge of environmentally conscious living through personal contact. Attitude formation based on such a personal relationship is probably one of the most effective ways of influencing lifestyle. It can be of significant social utility if the expansion of employment is aimed at working at civil organizations. In most cases, civil organizations were created to solve or deal with a social or environmental problem, so the employment that appears here most likely covers a socially useful activity. Due to their diverse activities, civil organizations can also be suitable for employing graduated, highly educated workers, which can be a rare advantage in rural, village environments.

What is even more important than the development of the road network is the development of public lighting. In my project, I have already described why this is important, however, based on the personal insights of the university students in Yogyakarta, it is extremely dangerous at the moment, and it affects their everyday lives as well. Based on statistical data, the level of crime has decreased in recent years, but even better results could be achieved by building a reliable public lighting system, and the occurrence of sexual violence would also decrease. That is why the solution could be if Hungary, within the framework of a diplomatic transfer, helps Yogyakarta develop its public lighting system by creating a kind of Smart Lighting System. It is also special because, with the help of the latest technologies, some urban areas are looking for intelligent lighting systems that can be remotely controlled and adjusted based on various factors. Smart public lighting technologies aim to improve energy efficiency by dynamically adjusting the brightness of streetlights. This not only reduces energy consumption but also contributes to environmental sustainability. It is often integrated into

broader smart city initiatives. It contributes to creating more connected, efficient, and sustainable urban environments. The system can collect data on usage patterns, pedestrian traffic, and environmental conditions. This data can be valuable for urban planning, traffic management, and public safety.

These systems can contribute to energy savings and efficient maintenance. since Yogyakarta is huge, it is possible that it would not be able to supply the entire system with electricity, which is why the use of LED lights can be a solution for the more distant parts of the city, thereby reducing costs and environmental impacts.

10. Expansion of the exchange student program

Yogyakarta is a university city, but the buildings of most universities are not exactly in the most modern condition. That is why, within the framework of the scholarship program, the Hungarian state provides financial support to all these universities in the framework of a diplomatic transfer for the partner universities, so that they can improve their equipment and hold their university courses in better conditions. From an environmental point of view, it could be considered forward-looking if the description includes not only the renovation and expansion of the building but also the renovation of the related environment and institutional yard. The renewal process of urban areas has a significant environmental impact, both directly and indirectly. In addition to significantly improving the students' conditions, this would also significantly improve the image of the university and even make it more attractive for foreign exchange students to have a more modern building.

Indonesia may engage in education diplomacy by providing training programs and capacity-building initiatives for professionals and students from other countries. In the framework of cultural diplomacy, in addition to international exchange student relations, we would also expand with language programs; universities in Yogyakarta may offer language programs, including Bahasa Indonesia courses, which may attract international students interested in learning the local language and understanding cultural nuances. This can bring Indonesian and Hungarian cultures closer together, and Hungarian students can learn a special Asian language up close. In a multicultural environment, the need for students to get to know each other's culture would also increase, therefore, within the framework of the program, universities often organize cultural events, festivals and performances that present Yogyakarta's diverse cultural heritage. These events attract international participants and audiences, contributing to the city's reputation as a cultural centre. During the events, foreign exchange students would have the opportunity to present their own country and culture, and in the case of Hungarian students, they would bring Hungarian culture closer to the Far Eastern country by representing Hungary. In this way, it would be possible to create intercultural student projects that can explore cultural topics and heritage preservation, which promote intercultural dialogues. Yogyakarta is known for its vibrant art scene. Universities can have programs that support and promote traditional and contemporary arts, attract the attention of the global community, and contribute to cultural diplomacy.

What I consider to be one of the most important aspects is the organization of international conferences. Within the exchange student program framework, great emphasis would be placed on international conferences and symposiums, both at universities in Yogyakarta and in Hungary, on scientific and cultural topics. At these events, scientists, experts, practitioners and students of the two countries could meet, promoting dialogue and exchange of ideas. In the case of students preparing for or visiting Hungary, this would be mandatory, as well as in

the case of Hungarian students going to Indonesia. On the occasion of the conferences, it is also possible to talk about joint research, in which international institutions operating at the local level of the given country could be involved, in the case of Hungary this could be the Institute of Foreign Affairs and Foreign Trade, or the Danube Institute's department dealing with Asian relations. These projects can explore cultural themes, heritage conservation and other topics that promote intercultural dialogue. By actively participating in these activities, Yogyakarta's universities contribute to the city's role as a cultural and educational centre and strengthen cultural ties with the global community. Through academic initiatives, cultural diplomacy helps build bridges between nations and fosters a deeper appreciation of different cultures. The programs can lead to great long-lasting friendships, which can represent a kind of investment in the future, either on a human or professional level. In any case, it includes a kind of future cooperation between the citizens of the requesting country. This can even have an impact on the tourism of both countries if relations are built thoughtfully and dynamically.

11. Conclusion

The island of Java and the city of Yogyakarta want to establish closer diplomatic cooperation with Hungary, especially in the fields of culture, science, technology and tourism. Although there are not many cultural and historical connections between Indonesia and Hungary, it is nevertheless possible to explore similarities, such as the study scholarship program, tourism or cultural cooperation listed in this project. Indonesia sympathizes with Hungary, as a freedom-loving and hospitable people with no history of colonization and oppressed by the great powers for centuries. The project aims to bring Hungarian-Indonesian cultural relations closer together, as well as to promote the development of digitalization and technology, thereby enabling the development of a more sustainable lifestyle.

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A Project to Strengthen Indonesian-Hungarian Bilateral Relations: Danube to Archipelago Students' Dialogue

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1. Abstract

The paper provides a comprehensive overview of the proposed "Danube to Archipelago Students' Dialogue" project, aiming to foster educational and cultural exchange between Indonesian and Hungarian students. It delves into the significance of Indonesia, emphasizing its growing economy, geopolitical importance, and its role within the Association of Southeast Asian Nations (ASEAN). The essay discusses the current state of Indonesian-Hungarian relations, highlighting the increasing bilateral diplomatic and economic ties between the two countries. Furthermore, it outlines the project's objectives, stakeholders, areas of cooperation, detailed description, project timeline, roles for organizers, and long-term objectives. The author emphasizes the potential benefits of the project for economic growth, enhanced educational cooperation, and the improved global standing for Hungarian universities. Additionally, it highlights the significance of hosting Indonesian students in Hungary, fostering cultural exchange, and promoting tolerance. It also underlines the benefits for stakeholders involved, such as MCC's establishment as a prominent platform for Indonesian-Hungarian dialogue and the valuable experience and insights gained by the students involved.

2. Introduction

2.1. The Significance of Indonesia

With the fourth largest population in the world, a rapidly growing economy and also a geopolitically strategic location, Indonesia is becoming one of the most significant actors in Southeast Asia, whose influence will continue to grow in the upcoming decades, consequently making the country a point of interest for Hungary, especially regarding the government's 'Eastern Opening' economic diversification strategy. Due to its advantageous location at the meeting point of the Pacific and Indian oceans, Indonesia is a key participant in regional commerce and security channels. The country's vast natural resources, including copper, nickel, gas and crude oil, its abundant young workforce and enormous market size are all great advantages they possess. Currently the sixteenth largest economy in the world by GDP,⁰ it is projected that Indonesia could jump all the way to seventh place by 2030, thus overtaking Germany and the United Kingdom.⁰

⁰ World Data, (2023) Biggest economies in 2022 by gross domestic product, World Data 2022 <https://www.worlddata.info/largest-economies.php>

⁰ Oberman, et al (2021) 'The archipelago economy: Unleashing Indonesia's potential, McKinsey & Company https://www.mckinsey.com/~media/mckinsey/featured%20insights/asia%20pacific/the%20archipelago%20economy/mgi_unleashing_indonesia_potential_executive_summary.ashx

Indonesia holds a prominent role within the Association of Southeast Asian Nations (ASEAN), as it is the largest nation among ASEAN members in terms of both size and population. Jakarta is vital in determining the geopolitical environment as well as promoting stability in the region, therefore it often assumes a leadership position in initiating and assisting the formulation and execution of regional policies and programs.

During our study trip to Indonesia, we visited several key institutions and partook in discussions with their respective professionals, which provided us with an in-depth understanding of Indonesia's foreign policy as well as the strategy the country hopes to follow in the upcoming years. Through these conversations we learned that the key concept of their foreign policy is non-alignment, meaning that they do not plan to become military allies with either China or the US and that they will not decouple from China either due to Western pressure or any of the sort. China is one of Indonesia's most crucial economic partners, therefore the stability and prosperity of Indonesia's economy is prioritized over the geopolitical competition between the West and China. Furthermore, Indonesia sees itself as a key mediator and balancer of regional powers and affairs, with a heavy focus on peaceful diplomatic initiatives. Another aspect of this foreign policy are the terms 'free and active', meaning that Indonesia, retaining its sovereignty, will act as their national interest demands, not submitting themselves to any foreign power's will, while also actively engaging in dialogue and cooperation with all sides. This makes Indonesia an excellent country to look towards in terms of Hungary's 'Eastern Opening' strategy, because not only does Jakarta's stance guarantee peace and stability – at the very least in terms of geopolitics – but it also in a way resembles Budapest's drive to remain sovereign in the shaping of their foreign policy, despite being a part of the transatlantic alliance and the European Union.

2.2. The Current State of Indonesian-Hungarian Relations

Despite the great physical distance that separates our countries, in recent years we have observed that bilateral diplomatic as well as economic relations have become closer due to the conscious effort made by both parties to diversify the composition of their cooperative partners.

Numerous Hungarian investment projects have been realized in Indonesia over the past decade, mainly in the fields of infrastructure and telecommunications. Some notable projects include the building of water purification and gamma irradiation plants, as well as toll systems. An Indonesian-Hungarian Investment Fund (IHIF) is also in the making, which will support the implementation of infrastructure development projects in Indonesia with Hungarian participation.⁰

The development of economic relations is also supported by the dynamics of educational cooperation. Under the Stipendium Hungaricum programme, an increasing number of Indonesian students (up to one hundred per year) are starting their studies in Hungarian higher education institutions, while at the same time more and more Hungarian and Indonesian universities are establishing collaborative projects.⁰

⁰ Embassy of Hungary Jakarta, (2023) Gazdasági Kapcsolatok – Indonézia, Magyarország Nagykövetsége Jakarta, <https://jakarta.mfa.gov.hu/page/gazdasagi-kapcsolatok-indonezia>

⁰ Növekedés.hu, (2021) Magyar exportsikerek a világ negyedik legnagyobb országában <https://novekedes.hu/elemezsek/magyar-exportsikerek-a-vilag-negyedik-legnagyobb-orzagaban>

2.3. Areas of Cooperation Relevant to the Proposed Project

Indonesia is developing and digitalizing at an astonishing rate, with major achievements reached in fostering tech-startups and developing an environment which is capable of producing its own local digital and innovative solutions.⁰ Local e-commerce sites and mobile phone applications are thriving; however, more general infrastructural conditions, such as ICT, are lacking – this is where the expertise of Hungarian companies can play a major role, therefore establishing one of the key areas in which Indonesian-Hungarian relations could flourish.

An issue in relation to this is that the archipelagic country will face is the lack of a sufficient quantity of highly skilled labor that is needed to continue this level of growth and to move upwards on the value chain. The main causes of this include an underdeveloped education system and prominent regional disparities. Skill gaps primarily arise within the manufacturing and services sector for high level positions, whereas the skills which are predominantly in demand are English and computer skills.⁰ It is to be expected that the demand for labor in STEM related fields will grow by 17% worldwide⁰, however the quality of STEM education and overall skillfulness is relatively low in Indonesia, as such the shortage of labor in these areas will also grow, potentially hindering further development and growth.⁰ Taking these aspects into account, Hungarian higher education has a lot to offer Indonesia, therefore before the skills gap becomes even more prominent, an initiative which could foster the educational cooperation between the two countries would be greatly beneficial for the future. However, closer cooperation has to start from somewhere, which is the broader goal of my project proposal.

3. Building a Foundation for Future Cooperation: Danube to Archipelago Students' Dialogue

3.1. What is the Danube to Archipelago Students' Dialogue and What Does It Hope to Achieve?

My project proposal, titled Danube to Archipelago Students' Dialogue, as its name suggests, is a project which focuses on exchange and cooperation between Indonesian and Hungarian students. As both countries are relatively unknown to each other, proper understanding and familiarization with one another's culture and values, as well as establishing connections is the first stepping-stone to closer cooperation and ties between the two countries in the future. As there are minimal possibilities to achieve this, the Danube to Archipelago Students' Dialogue hopes to fill this gap and provide a platform for cultural and educational exchange.

⁰ Palaon, (2023) Indonesia's digital success deserves more attention, The Interpreter <https://www.lowyinstitute.org/the-interpreter/indonesia-s-digital-success-deserves-more-attention>

⁰ di Gropello, et al (2011) Skills for the Labor Market in Indonesia Trends in Demand, Gaps, and Supply, The World Bank, Washington DC, ISBN: 978-0-8213-8614-9, <https://documents1.worldbank.org/curated/en/840381468262793742/pdf/608120PUB0Skill10Box358333B01PUBLIC1.pdf>

⁰ Buther D., (2013) Employment Outlook for STEM Professionals Is Robust -- and Moving Beyond Traditional Occupations, Thomas Xometry <https://www.thomasnet.com/insights/imt/2013/01/22/employment-outlook-for-stem-professionals-is-robust-and-moving-beyond-traditional-occupations/>

⁰ Nugroho O., et al, (2021) The Urgency of STEM Education in Indonesia, Journal Penelitian dan Pembelajaran IPA, Esa Unggul University, Faculty of Teacher Training and Education, <https://jurnal.untirta.ac.id/index.php/JPPI/article/view/5979>

3.2. Project Stakeholders

The main organizations that this project would target are Perhimpunan Pelajar Indonesia seDunia (from now on PPI), as in the Overseas Indonesian Students' Association Alliance, specifically the branch of the organization operating in Budapest, PPI Hungary, and Mathias Corvinus Collegium.

PPI is a non-profit and non-governmental organization which serves as a platform that facilitates Indonesian students pursuing academic degrees abroad to exchange experiences and knowledge, contribute to the country's development by presenting government perspectives on current and future challenges, as well as run social projects to encourage Indonesian citizens to study abroad. I have chosen PPI because it consists of ambitious and devoted students and professionals, all while the organization itself is in close contact with Embassy of the Republic of Indonesia in Hungary, as well as the Indonesian Trade Promotion Center (ITPC).

During our insightful study trip to Jakarta and Yogyakarta, contact was made with several other potential stakeholders, most of who could also participate in the project in the form of reviewing the student research projects (this would mostly be done online) and providing feedback, as well as participating in person in the conference that would be held at the end of the project. Faculty members as well as students from the universities which we have visited would be the ideal providers of feedback. Some Indonesian students have mentioned that involving student organizations from Indonesia would also be beneficial, as they could also provide valuable feedback, and maybe in the future further cooperation could be developed between the students of MCC and these organizations.

3.3. What Will This Project Offer Each Participant and Stakeholder?

First, I would like to begin with what this project would offer each stakeholder, beginning with MCC. This project could be realized by the students of the International Relations School, all while students from any section of MCC can participate. Organizing this project would give the students valuable experience and connections which would greatly benefit their future. MCC would have the opportunity to provide an essential platform for Indonesian-Hungarian dialogue, which consequently would make it a relevant and respected actor regarding the deepening of our bilateral relations. The students who participate in the project would have an expectational opportunity to deepen their knowledge about Indonesia in an exceptional way, which is not through secondary sources, but from locals themselves who can provide valuable insight on how they personally experience Hungary and what opportunities they see for cooperation. Additional offers include worthwhile connections that spread to the other side of the world and a chance to conduct a joint research project which would then be presented to an expert audience.

The participants from PPI would also receive these special opportunities which would further their academic and professional careers, while also getting the chance to share their personal opinions about how our bilateral relations could evolve, as well as share what the needs of Indonesian students in Hungary are. Since the organization already serves as the primary link between Indonesian students and Hungary, cooperating with MCC and local students could potentially create more prospects for students already in Hungary and those that wish to eventually come here.

3.4. Detailed Description of the Project

The first stage of the project is establishing a connection between the two primary stakeholders: the students of PPI and MCC. This stage would commence with an introduction meet-up, followed by a few more informal events in order to get the students to become accustomed to and get to know each other, as this is the basis for successful long-term cooperation. After this point has been reached, more professional workshops and projects can begin, during which the students can focus on areas of interest for our two countries' bilateral relations that would involve receiving valuable input from both sides and developing ideas and recommendations which would not only be mutually beneficial, but also deepen our diplomatic relations.

As discussed in the introduction, the main areas in which Indonesia and Hungary cooperate are infrastructure – specifically water supply and waste-water management, energy, and waste management, as well as renewable energy. Information and communication technology, such as banking, data management, payment and security software also comprise areas of cooperation. Technology transfer is an especially interesting aspect of our bilateral collaboration, in which Hungarian companies develop innovative urban management methods, including integrated traffic management and passenger information systems.⁰ Due to the great distance between the two countries, tourism is less prominent, however this does not mean that this cannot be developed and fostered in the future, as progress in this area has already been achieved: in just a few years, the number of Hungarian tourists in Indonesia has tripled, meaning there is great potential for improvement.⁰

Educational cooperation has also been strong – each year, Indonesian students have the opportunity to take part in the Stipendium Hungaricum scholarship program, which has recently been expanded from accepting fifty students to accepting one hundred.⁰ Nearly 30 Hungarian students will receive the Darmasiswa scholarship offered by the Indonesian government to learn the Indonesian language and culture.⁰ As a result of the collaboration between the National Bank of Hungary and the Budapest Business School, the Oriental Business and Innovation Centre (OBIC) was established in 2016.⁰

All of these topics can become starting points for further discussion, debate, and development, which is exactly what the following stage of the project would consist of. Hungarian and Indonesian students would each form teams of two or three and prepare a presentation on one of these subjects. Depending on the number of participants, students could choose which topic interests them the most. Each workshop would have a specific topic, which would be presented by the students. The presentation would be around 15 to 20 minutes long and would serve as a briefing for the other students who are not knowledgeable

⁰ Embassy of Hungary Jakarta, (2023) Gazdasági Kapcsolatok – Indonézia, Magyarország Nagykövetsége Jakarta, <https://jakarta.mfa.gov.hu/page/gazdasagi-kapcsolatok-indonezia>

⁰ Pálfy, Á., (2021) Üdvözlét Jakartából – Az indonéziai magyar nagykövet az MCC Ambassador Talks-ban, Mandiner <https://mandiner.hu/belfold/2021/04/mcc-indonezian-magyar-nagykovet>

⁰ Növekedés.hu, (2021) Magyar exportsikerek a világ negyedik legnagyobb országában <https://novekedes.hu/elemezsek/magyar-exportsikerek-a-vilag-negyedik-legnagyobb-orzagaban>

⁰,Government of Hungary (2023) Magyar-Indonéz Gazdasági Vegyes Bizottság Ülése Jakartában, Magyarország Nagykövetsége Jakarta <https://jakarta.mfa.gov.hu/news/magyar-indonez-gazdasagi-vegyes-bizottsag-uelese-jakartaban>

⁰ Növekedés.hu, (2021) Magyar exportsikerek a világ negyedik legnagyobb országában <https://novekedes.hu/elemezsek/magyar-exportsikerek-a-vilag-negyedik-legnagyobb-orzagaban>

about subject. Following this section, a discussion will commence about the presented subject, where students can freely ask questions. Personal experiences and opinions, regarding topics which warrant them, would also be warmly welcomed, as this would be the perfect opportunity to share not only theoretical knowledge, but to also hear practical information. Ideally, this phase of the project would also include outside expertise, such as professionals or professors, who could answer more specific technical questions and also provide valuable insight. This series of workshops would allow both groups to become familiar with the most important aspects of Indonesian-Hungarian bilateral relations.

The final phase of the project would arguably be the most crucial, as this would essentially be the end product of the entire Danube to Archipelago Dialogue project. This stage would be a joint research project conducted by the previously formed groups on the topics which they have chosen for their presentation, in which they would analyze the current state of a certain aspect of cooperation and develop proposals through which these could be improved. The findings of these studies could be presented in a conference to which delegates of key organizations and institutions, like the Embassy of the Republic of Indonesia in Hungary, the Indonesian Trade Promotion Center, the Oriental Business and Innovation Centre or the Hungarian Export Promotion Agency. Think-tanks and other institutions from Indonesia could also participate online or maybe even in person, like the Foreign Policy Community Indonesia, the incentive which would bolster enthusiasm and willingness to conduct a study would be an opportunity to publish their findings, as well as be able to network with key figures in Indonesian-Hungarian relations.

Following the conference, if the budget allows it, a lively informal event could be organized in order to celebrate the success of the Danube to Archipelago Students' Dialogue as well as to celebrate the friendships that have been formed and the hard work that everyone has put in.

The final phase of the project would be the follow up, including sending out thank-you emails to all participants. Key takeaways and insights could also be shared on the social media pages of MCC and other participants, as a way of spreading the word about the fruitful cooperation between the students and experts of our two countries. By actively following up, the connections that were made during the course of the projects can be solidified for further projects in the future. By sharing the Danube to Archipelago Students' Dialogue on social media, connections can be established with other participants, speakers, and organizers. MCC's professional network will grow as well as a result and will further promote interest in our institution and work. The posts about the conference can provoke conversation among each of our institution's followers. By encouraging people who took part in the project to share their experiences and thoughts, these posts will help promote interaction on our social media platforms and foster a sense of community and involvement.

The joint research projects of the students could be published by MCC Press, and snippets of the research could be published on the Corvinák blog. Before the conference, the experts from Indonesia could also hold courses at MCC about Indonesian politics, foreign policy, or economics.

3.5. Project Timeline

As of now, no specific dates will be proposed, however the approximate chronological intervals between workshops and meet-ups will be drafted. Most likely the workshops will be held every two or three weeks, depending on the schedules of the students' and invited

experts. Following the second session there will most likely be a longer period of inactivity in order to find suitable dates for our expert guests. The duration of the project itself would depend on the number of topics which have been chosen. The first couple of sessions will be more informal and therefore also shorter, but the later ones will have a duration of one and a half hours.

Following our study trip, there was discussion about a future conference regarding Indonesia, which would presumably be held sometime during the autumn of 2024. My project would ideally conclude before this conference, so that the students can also present their findings. As such, the beginning of September would be the most optimal time for the project to commence, and if time constraints demand it, the first few informal sessions could either be disregarded all together, or the consecutive professional workshops could be held in one longer block, the duration of which would depend on the number of topics that have been chosen. The follow up thank-you emails, and social media posts should be sent and uploaded within one week of the conference. Here is a more in-depth look at the elements of the potential conference, held in the Budapest centre of MCC.

3.5.1. Kick-off Introductory Session:

This first session will mainly focus on introducing the project to the participants and also getting to know one another and breaking the ice through teambuilding exercises and other fun activities. Food and drinks will be provided. One or two students from each group will be selected to prepare a short presentation about interesting facts about their respective countries, preferably about something only natives would know or something that is not common knowledge. These will be presented during the next session.

3.5.2. Indonesian and Hungarian Culture at a Glance:

This session will also be a fun and informal get-together which will focus on the cultures of both countries through the previously mentioned presentations and other activities, such as quizzes and other games. Traditional Indonesian and Hungarian cuisine will also be provided, furthermore it would also be great if traditional dresses, dances, or music could also be showcased, or some other items of cultural significance.

3.5.3. Professional Workshops:

All of these workshops will follow the same structure, which is as follows: first, the topic will be presented by the students, which will be followed by questions and discussion with each other and the invited expert. The number of workshops will depend on the number of groups.

3.5.4. Conference

Following the workshops, a certain amount of time will be given to the students who wish to further their research. Afterwards, a conference would be held about the bilateral relations between Indonesia and Hungary, where not only the students' research would be presented, but other experts from MCC and other institutes, as well as significant diplomatic figures would be invited. In Indonesia, we partook in discussions with several professionals and government officials, who could be invited to participate in the conference, such as Mr. George Iwan Marantika, honorary consul of Hungary, or Ms. Spica A. Tutuhaturunewa, director of the Center of Policy Strategy for America and Europe.

Concluding Event: An informal celebratory event would be held sometime after the conference. My primary proposal for this would be a nighttime sightseeing cruise along the

Danube, as this would not only be a unique and memorable experience, but it would also symbolize the project's essence of connecting two widely different cultures through dialogue. Specifically, a cruise from Silverline Cruises would be optimal, as it does not include alcohol, which Indonesians of the Muslim faith do not consume, but food and drinks can still be individually bought onboard.

3.6. Roles and Tasks for Organizers (to be deleted)

- **Project Manager:** The task of the project manager will be to efficiently plan and oversee the events as well as to be the main representative for MCC.
- **Assistant Organizer:** The assistant organizer will be tasked with assisting the project manager.
- **Marketing Coordinator:** The marketing coordinator would be responsible for creating online content which showcases and promotes the project. Collaboration between the social media profiles of MCC and PPI Budapest should be utilized. The task of photographically documenting and sharing the project is also the responsibility of the Marketing Coordinator, however for the conference there will be a professional photographer (perhaps one of our very own students could fulfill this position)
- **Communications Coordinator:** The communications coordinator would be responsible for upholding a channel of communication between MCC, PPI and the invited experts.
- **Communications Assistant:** The assistant would be tasked with answering individual student inquiries about the details of the project as well as the research paper.
- **Procurement Coordinator:** The procurement coordinator would be responsible for procuring the funding needed in order to organize the planned events.
- **Financial Coordinator:** The task of the financial coordinator would be to plan the expenses of the project and efficiently allocate the given funds.
- **Activity Coordinator:** The activity coordinator would be responsible for leading the group activities.
- Students from MCC that assist with miscellaneous tasks, such as shopping, preparing the rooms, or coming up with team building activities.

3.7. Topics to be Discussed (to be deleted)

The following is a list of topics which could be presented and studied, in no particular order, including an expert in the field who could be invited to partake in the discussion:

- **Water Management Technology:** Director of Development, Sustainability and Innovation, Budapest Waterworks
- **Internet and Communication Technology:** CEO, Vice President of Business Development and Project Management, Cellum Global Zrt.
- **Technology Transfer:** CEO of Roatex Zrt.
- **Tourism:** Deputy Director General for Strategic Implementation of Tourism, Hungarian Tourism Agency

- **Cultural Exchange:** Deputy Head of Information, Social and Cultural Section, Embassy of the Republic of Indonesia
- **Education:** Stipendium Hungaricum Programme Officer for Indonesia
- **Agrotech:** Director of the Research Institute for Fisheries and Aquaculture
- **Modern Urban Planning:** DLA, Architect, Associate Professor of the Department of Urban Planning and Design of the Budapest University of Technology and Economics (BME)
- **Fintech and Cybersecurity:** CEO of White Hat IT Security
- **Wider Cooperation between ASEAN and the European Union:** Director of the Center of Policy Strategy for America and Europe; dr. Ascsillán Endre, Head of the ASEAN Department of the Hungarian Chamber of Commerce and Industry

Since the professionals who would be invited have busy schedules, the participants would have to adapt to the dates that are suitable for the guests, however there would be adequate time between the distribution of topics and the first seminar, so the students would be able to plan ahead. During the professional workshop sessions, Zoom/Teams meetings could also be conducted with experts from Indonesia.

3.8. Research Project

The final study would have to be approved by MCC in order to be presented, however following the approval and the conference, every study could be joined into one comprehensive publication on Indonesian-Hungarian relations, or parts of the research could be published on Corvinák, the online blog ran by MCC.

3.9. Long-term Objectives

The Danube to Archipelago Dialogue could be a basis for further cooperation between our two countries in various fields, especially education. Following the closure of the project, PPI would document and share their experiences to students back in Indonesia in order to inspire them to come study in Hungary, as they would see how many opportunities there are specifically for Indonesian students.

This would be beneficial for both countries, as interactions between local students and Hungarian students from all backgrounds promote tolerance and understanding across cultural boundaries. Tuition fees, which are frequently paid by international students, can make a substantial contribution to both the local economy and the income of educational institutions. Some students may also decide to work short-term or do an internship in Hungary after completing their education, adding to a talented and varied workforce. Diversity in the employment can foster greater creativity and innovation because people with various cultural origins often bring fresh viewpoints and methods for approaching problems. By welcoming international students, educational institutions in Hungary can boost their standing internationally and draw in additional scholars and students from throughout the globe. In the future, these talented Indonesian students could be beneficial for building even closer ties between us, because they possess a deep and comprehensive knowledge and understanding of both countries, as well as professional connections.

The Indonesian economy would also greatly benefit, because if closer cooperation between our educational institutions develops, especially in the field of STEM, Hungary would make a perfect spot for Indonesian students to learn essential skills that are in high demand as Indonesia's economy develops and shifts to a knowledge-based economy. Currently, as I mentioned in the introduction, Indonesia is dealing with a scarcity regarding high-skilled labor, and the English knowledge of the Indonesian workforce is also not adequate. Therefore Hungary would not only be optimal to pursue an education that would greatly improve the students' and the Indonesian economy's prospects once utilized at home, but also to improve their language skills and become fluent through studying, writing, researching and simply communicating in English. It has also come to my attention that international students in Hungary usually do not interact with Hungarian students very much, therefore this project would create an excellent opportunity to break these barriers.

If Hungary is promoted successfully as a high quality and attractive destination, more and more students from Indonesia will come here, in turn it is to be expected that the Stipendium Hungaricum programme will also increase its number of places from one hundred to even more, granting every hopeful student a chance to study here.

Regarding Hungary, this project could pave the way for more opportunities in Indonesia for students, but also for companies. Through the conducted research, potential gaps could be discovered in which Hungarian expertise could be utilized, in turn this would offer the Hungarian economy a plethora of benefits, such as economic growth by opening new markets and business opportunities.

Highly talented individuals would study and research in Hungarian universities which would improve their standing in regional and international rankings. Indonesian and Hungarian universities could also develop several joint projects, like exchange programs that foster cross-cultural understanding and global perspectives among students; visiting scholar programs which promote knowledge exchange, research collaboration, and the sharing of teaching methodologies and best practices; joint research projects that could lead to innovative solutions, access to diverse resources, and increased research output, as well as enhance the international reputation of participating institutions. All of these initiatives would improve the innovative and competitive capabilities of Hungary, consequently improving the domestic economy through productivity growth, human capital development and job creation.

4. Conclusion

The archipelagic country faces challenges related to a shortage of highly skilled labor due to an underdeveloped education system and regional disparities. Skill gaps are prominent in manufacturing and services, with demand for English and computer skills. Global STEM labor demand is expected to grow by 17%, but Indonesia's STEM education quality is relatively low, leading to a shortage of skilled labor.

Recognizing these challenges, Hungary and its higher education system can offer valuable assistance to Indonesia. An initiative to enhance educational cooperation between the two countries is crucial before the skills gap worsens.

This proposal offers numerous benefits for both countries. For Hungary, it could open doors for students and businesses in Indonesia, leading to economic growth. Furthermore, it can enhance the standing of Hungarian universities in international rankings, foster cross-cultural

understanding, facilitate knowledge exchange, and boost research collaboration. These initiatives contribute to Hungary's innovation and competitiveness, ultimately benefiting its domestic economy.

Hosting Indonesian students benefit both Hungary and the students' home countries. These interactions promote tolerance and foster curiosity. Tuition fees and other costs would contribute significantly to the local economy and educational institutions. Some students may even work or intern in Hungary, diversifying the workforce, which fosters innovation, and this international presence in our country's higher education enhances the global reputation of Hungarian educational institutions. In the future, these students can contribute to building closer ties between Hungary and Indonesia, leveraging their knowledge and connections.

The stakeholders involved also receive several benefits: MCC can establish itself as a prominent platform for Indonesian-Hungarian dialogue, enhancing bilateral relations. Students involved gain experience, connections, and deep insights into Indonesia and Hungary, enriching their future prospects. PPI participants can also benefit significantly by collaborating with MCC and Hungarian students, thus creating more opportunities for Indonesian students in Hungary and those aspiring to study here.

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Gemstone Renaissance: Revitalizing Indonesian-Hungarian Ties through Economic and Cultural Exchange

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1. Abstract

The paper explores the potential impact of economic and cultural relations between Indonesia and Hungary through gemstone education and exhibitions. Highlighting the historical significance and economic implications of gemstones, the authors present a visionary plan for revitalizing Indonesian-Hungarian relations. The emergence of synthetic gem production is transforming the gemstone industry, offering opportunities and challenges. The rise of Indonesia's colored crystals presents economic possibilities and cultural symbolism. Educational initiatives, including school exhibitions and traveling displays, aim to foster cross-cultural interaction and deepen understanding. Addressing potential barriers, the authors stress the importance of navigating bureaucratic and cultural differences, proposing cooperative measures for environmental sustainability. Looking towards the long-term impact and sustainability, the paper emphasizes the necessity of stakeholder engagement and commitment to addressing environmental challenges. Overall, the paper presents a compelling case for the transformative potential of gemstone education and exhibitions in fostering deeper economic and cultural cooperation between Indonesia and Hungary, while also emphasizing the importance of sustainable practices and environmental stewardship.

2. Introduction

International relations are underlined by the threads of economic interdependence and cultural exchange. Within this complex framework lies a gem-filled history of cooperation and discovery between Indonesia and Hungary. Although geographically distant, these countries share a common history of trade and diplomatic relations. The special relationship between the two countries has great significance, not only for economic perspectives, but also for the cultural enrichment that results from their interactions, and these aspects can be very profitable for both countries.

The historical background of Indonesian-Hungarian relations goes back to the diplomatic relations established in the mid-20th century. Over the decades, the partnership has blossomed, extending from trade to scientific and cultural ambitions across a range of sectors. This relationship provides the backdrop against which a new chapter is unfolding, led by the brilliance of gemstones. The economic environment has witnessed a seismic shift with the emergence of synthetic gem production, casting a transformative light on the valuation of diamonds. At the same time, Indonesia's colorful crystals, like sapphire, emerald, topaz, and ruby are harbingers of a renaissance in the gemstones industry that, in parallel to a booming economy, can build on the past through cultural appreciation and a shared understanding of culture to create a shared present and a prosperous shared future.

This paper aims to understand and appreciate the complex anatomy of economy, culture, and gems that can shape Indonesian-Hungarian relations. I would like to explore the multifaceted impact of the production of non-natural gemstones on diamond valuation and due to these events, the rise of Indonesia's multi-colored crystals, positioning them not only as a cultural representative but also profitable resource. I seek to illuminate their potential for strengthening ties between Indonesia and Hungary, and how the rise of colored crystals can be used to promote education, appreciation, and acceptance, not only within the gemstone industry but also in the wider range of economic and cultural exchange, involving all sectors of society in the structural relationship.

Essentially, this exploration serves as an illustration of the power of gemstones and illuminate the path towards deeper understanding and cooperation. It highlights the potential for a gemstone renaissance, not only in revitalizing Indonesian-Hungarian relations but also as a beacon of shared heritage and economic growth for bright future bilateral ventures, symbolizing the relationship between the two countries and emphasizing the importance of building prosperous ties.

3. Diamonds vs. Artificial Production

3.1. Historical Importance of Diamonds in the Gemstone Industry

The history of diamonds in the gemstone industry is a story woven through time, where the brilliance and rarity of diamonds tell a story of abundance and prestige. Throughout history, diamonds have been revered for their beauty and exceptional durability. Rulers and nobles worshipped them as a symbol of power and wealth, adorning their crowns, scepters, and ceremonial dresses. They also became a symbol of invincibility, believed to protect in battle and ward off malevolent forces like a talisman.⁰

In the case of the heart, the diamonds became an ultimate symbol of love and commitment. Due to their unbreakable and still beautiful nature being seen as a metaphor for enduring and endless love, diamonds have become a permanent part of engagement and wedding rings, a tradition that has continued to this day. As well as being a symbol and emblem of love, diamonds have also become a store of value over the centuries, signifying the status of their owner and their family. The diamond's charm and brilliance are widespread and have become ingrained in cultural customs and beliefs across continents.^{0 0}

However, the romantic narrative around diamonds has recently been transformed by the advent of artificial production techniques and the lack of detection tools and methods. The once impenetrable power of natural diamonds is now being challenged as the gemstone industry stands on the threshold of a new area.⁰

⁰ Beers, D., (2022) A Brief History Of Diamonds, De Beers jeweller <https://www.debeers.co.uk/en-gb/a-brief-history-of-diamonds.html>

⁰ Odogen, J., (2018) Diamonds, love and history, Yale University Press <https://yalebooks.yale.edu/2018/04/20/diamonds-love-and-history/>

⁰ Choyt, M., (2012) The Price of Diamonds: A Cultural, Economic, and Historical Analysis, Bulletin of Science, Technology & Society

⁰ London, D. R., (2021) The History Of Diamonds, Diamond Rocks <https://www.diamondrocks.co.uk/magazine/the-history-of-diamonds/>

3.2. Emergence of Artificial Production Techniques

The revolutionary and rapid development of science and industry made it possible for laboratories to achieve chemical breakthroughs in the production of diamonds. During the process of replicating the extreme heat and pressure of underground where diamonds are created, artificial diamond production has become a game-changing breakthrough. This development not only marks the successful synthesis of diamonds but also symbolizes a revolutionary change in gemstone production and their market all over the world.⁰

The boom in synthetic gemstone production is causing problems for traditional supply chains, offering gemstones that are often identical, making it difficult to distinguish the real from the imitation, even with serious machinery. This poses challenges for established valuation and trading mechanisms and democratized access to diamonds. Industries, from designer jewelers to haute couture to industrial applications, are now struggling to re-evaluate their supply and sourcing chains in response to this transformative wave. As economies of scale take hold, the cost of producing man-made gemstones is expected to fall, which could be a force to reshape the economic dynamics of the gemstone industry. This technological shift also holds the promise of more ethical and sustainable sourcing, alleviating concerns about conflict diamonds and environmental impacts.^{0 0}

In light of this revolution, we are on the edge of a new era, where the distinction between natural and man-made gemstones is becoming blurred, and these events can shape our definition of the gems and their representation. The economic and cultural implications lead us to redefine the role of gemstones, especially their impact on bilateral relations between Indonesia and Hungary, which not only demonstrates human ingenuity but also offers an opportunity to forge new economic and cultural ties rooted in this brilliant development.⁰

3.3. Economic Implications for Indonesia and Hungary

Indonesia, famous for its diverse gemstone industry, has reached a fortuitous turning point as man-made gemstone production is upsetting the status quo. Diamonds, once the cornerstone of Indonesia's gemstone exports, are undergoing a critical revaluation, but the country, also a major source of colored gemstones, could become a world leader in their export. The rise of man-made gemstone production, however, also offers a good opportunity for diversification and economic resilience. This technological leap offers an opportunity for Indonesia to turn to emerging markets and technologies to strengthen its position in the global gem trade, only perhaps with more colorful crystals as a focus.^{0 0}

⁰ A. A. Seru & K. C. Manivannan, . (2015), Challenges to the Diamond Supply Chain: The Role of Information and Technology. *Journal of Supply Chain Management*.

⁰ Hughes, R. W. (2013). *Economic Aspects of Synthetic Gems*. *Gemmology*

⁰ Yeates, W. (2018). Interest in Lab Grown Diamonds is Surging, Shows No Signs of Stopping, *International Gem Society* <https://www.gemsociety.org/news/2022/05/18/interest-lab-grown-diamonds-surging-shows-no-signs-of-stopping/>

⁰ Yeates, W. (2018). Interest in Lab Grown Diamonds is Surging, Shows No Signs of Stopping, *International Gem Society* <https://www.gemsociety.org/news/2022/05/18/interest-lab-grown-diamonds-surging-shows-no-signs-of-stopping/>

⁰ International Gem Society, (2021). The Impact of Lab-Grown Stones on the Gem Market, IGS <https://www.gemsociety.org/article/lab-grown-stones-gem-market-impact/>

⁰ Danzinger, P. N. (2021). Lab Grown Or Natural Diamonds? The Choice Is Getting Clearer For Consumers And Retailers, *Forbes* <https://www.forbes.com/sites/pamdanziger/2021/02/14/lab-grown-or-natural-diamonds-the-choice-is-getting-clearer-for-consumers-and-retailers/?sh=71cb621e62f9>

On the other hand, Hungary appears as a key player in this evolving narrative. As a potential consumer and trading partner, it can take advantage of the transformation. By playing a strategic role in the growing market for synthetic gemstones, Hungary can not only ensure a sustainable supply chain but also potentially facilitate a new wave of economic cooperation with Indonesia. Investing in research, development, and high technology could make Hungary an innovation hub for the synthetic gemstone industry. In addition, as people's faith in diamonds weakens, Hungary could also be a trendsetter in the advance of unadulterated colored crystals, potentially taking over the role of diamonds, and creating a whole new market.

3.4. Cultural Perceptions of Diamonds and Artificial Gems

The cultural narrative surrounding gemstones, and diamonds in particular, has been a symbol for generations. They have been revered as a sign of rarity, durability, and eternal love. However, the emergence of man-made gemstones is challenging these entrenched perceptions and prompting a reassessment of their cultural significance. The shift towards artificial production is starting a conversation about how societies are adapting to this changing trend. This transformation calls for an introspection of the symbolism and meanings attributed to gemstones. How will cultures redefine notions of rarity and durability concerning man-made gemstones? What new associations will emerge as these laboratory-made wonders come increasingly to the fore? These questions are at the heart of a dynamic cultural dialogue that will shape the narrative around gemstones in the coming years.⁰

As we navigate this changing landscape, it is crucial to appreciate not only the economic consequences but also the profound cultural changes taking place in the gemstone industry. This exploration seeks to shine a light on the multifaceted nature of this development, where the radiant charm of gemstones, whether natural or man-made, is leading us toward a future where economic and cultural connectivity between Indonesia and Hungary flourishes in newfound splendor.

4. Indonesian Colored Crystals: The Emerald Revolution

4.1. Overview of the Indonesian colored crystal industry

In the heart of Indonesia's rich geological landscape lies a treasure trove of colorful crystals, many still unexplored, the most significant of which is the brilliant emerald. The Indonesian color crystal industry is characterized by a diverse range of gemstones, each with its unique hue, origin, and appeal.⁰

Indonesia's mineral and trace element-rich geology provides the ideal deposits and potential for the formation of these outstanding gemstones. The archipelago's varied topography creates a spectrum of colorful crystals, from the deep green of emeralds to the vivid blue of sapphires, creating a dazzling palette that fascinates gemstone enthusiasts worldwide.⁰

⁰ McClure, T. (2021). All that glitters: why lab-made gems might not be an ethical alternative, The Guardian <https://www.theguardian.com/environment/2021/jul/24/all-that-glitters-why-lab-made-gems-might-not-be-an-ethical-alternative>

⁰ ISSU. (2014). Indonesian Gemstones, ISSU https://issuu.com/double-p-orange/docs/gemstone_spread

⁰ Clark, G. (2016). Indonesian Gemstones, Gem Select <https://www.gemselect.com/other-info/indonesian-gemstones.php>

4.2. Economic possibilities for Indonesia and Hungary

The emergence of Indonesian colored crystals, especially emeralds, as a global competitor in the gemstone market has had profound economic consequences for both Indonesia and Hungary. For Indonesia, this increase in demand represents a significant boost to its economy. Exports of emeralds have soared and have become a significant source of revenue. This newfound economic vitality is also having an impact on local communities, strengthening livelihoods, and promoting economic stability.⁰

Hungary, as a demanding consumer and potential trading partner, stands to benefit from this emerald revolution. The availability of high-quality Indonesian emeralds is a valuable resource for jewelers and artisans. This not only diversifies their sourcing options but also makes Hungary a participant in the global gemstone trade. Cooperation between Indonesia and Hungary in the marketing and distribution of emeralds has the potential to create a mutually beneficial economic ecosystem.⁰

4.3. Cultural appreciation and symbolism of emeralds

Emeralds have a special place in the cultural relationship between Indonesia and Hungary. In Indonesia, emeralds have cultural significance, often as symbols of prosperity, harmony, and spiritual well-being. Diamonds can be found in traditional jewelry, adorning ceremonial dresses and heirlooms passed down through generations. This deep-rooted cultural appreciation extends to Hungary, where emeralds are prized for their timeless elegance and are believed to bring good luck. As we immerse ourselves in the brilliant world of Indonesian coloured crystals, especially emeralds, it becomes clear that their economic and cultural impact goes far beyond their inherent beauty. They serve as channels of economic prosperity, cultural exchange, and shared symbolism. This emerald revolution, the rise of colored emeralds, and the erosion of people's faith in diamonds highlight the potential for deeper cooperation between Indonesia and Hungary, setting the stage for a renaissance in bilateral relations with gemstones.⁰

The symbolism of emerald transcends borders, embodying concepts of renewal, growth, and enduring love. The lush green hue evokes images of lush landscapes and the vitality of nature and resonates with people across cultures. Just as Indonesian emeralds are incorporated into Hungarian jewelry, they serve as messengers of this cultural exchange, bridging the gap between the two nations through a shared appreciation of these gemstones.⁰

4.4. Harnessing economic opportunities in the colored crystal industry

Amid the cultural and environmental considerations, the collaboration between Indonesia and Hungary can leverage the economic potential embedded in Indonesia's vibrant colored crystal industry. With an overview of Indonesia's rich geological landscape and the diverse range of gemstones it produces, including the brilliant emerald, there is an opportunity to create

⁰ Indonesian Mining Institute (2018). Report on Indonesia Mining Sector Diagnostic, The World Bank

⁰ Utkarsh Agarwal, & Abhishek Raj Kesarwani. (2015). Applied Engineering, International Journal of Applied Engineering Research

⁰ Clark, G. (2016). Indonesian Gemstones, Gem Select <https://www.gemselect.com/other-info/indonesian-gemstones.php>

⁰ ISSU. (2014). Indonesian Gemstones, ISSU https://issuu.com/double-p-orange/docs/gemstone_spread

economic value and stimulate trade in this sector. The exploration and sustainable extraction of these precious stones can become a focal point for economic cooperation.

Initiatives such as joint ventures in gemstone mining, gem-cutting workshops, and collaborative marketing efforts can be established. By tapping into the global fascination with unique and ethically sourced gemstones, Indonesia and Hungary can create a mutually beneficial economic ecosystem. This not only enhances Indonesia's position in the international colored crystal market but also provides Hungary with access to exquisite gemstones for its jewelry and luxury goods industry.

Moreover, integrating sustainable practices into the colored crystal industry will align with the overall commitment to environmental responsibility. This approach can ensure that economic growth is not only financially lucrative but also environmentally conscious, contributing to the long-term sustainability of the collaboration. By recognizing and harnessing the economic opportunities within Indonesia's colored crystal industry, the partnership can achieve a harmonious balance between economic prosperity, cultural enrichment, and environmental sustainability.

5. Educational Initiatives: Exhibitions in Schools and Travel

Amidst the kaleidoscope of gems, I have planned a visionary project plan to revitalize Indonesian-Hungarian economic and cultural relations. Imagine a journey that transcends geographical borders and weaves together the vibrant threads of Indonesia and Hungary through a symphony of colors, cultures, and values. At the heart of this creative and immersive project is jewelry, a timeless form of personal expression. It acknowledges that the jewelry we wear is not just an ornament, but also a bridge that connects us to distant lands and people. Just as the Indonesian archipelago is a mosaic of different cultures, the crystals in the gemstones are as diverse as the Indonesian people themselves. With their luminous allure, gemstones have the magical ability to capture hearts and minds, inviting people to discover and embrace the cultural heritage of a distant land.

5.1. Rationale for educational approach

My approach to education is guided by the belief that education is a powerful bridge that can cross geographical and cultural boundaries. Education is a catalyst for deeper understanding, empathy, and a sense of common heritage between nations. By focusing my efforts on jewelry, a universally appreciated and intimate form of self-expression, my goal is to infuse Indonesian culture and its rich existence into the daily lives of Hungarian students and all other individuals.

As a medium of artistic expression, jewelry transcends linguistic boundaries and resonates on a personal level. It has a unique power to evoke emotions, convey stories, and capture the essence of a culture. This approach goes beyond traditional teaching methods, allowing people to connect with Indonesia on a deeply personal level. It enriches their cultural awareness by fostering a real and emotional attachment to the nation, thereby laying the foundations for bilateral relations.

Through jewelry, individuals in Hungary not only learn about Indonesia but also embody it, wearing its symbol on their person. They will be wearing pieces of Indonesia's cultural heritage, allowing them to carry a piece of the archipelago in their hearts and on their bodies. This approach not only increases appreciation of the culture but also creates a lasting, personal connection to Indonesia. In these intimate connections lies the potential for a deeper and more lasting partnership between Indonesia and Hungary.

5.2. Organizing jewelry exhibitions in schools

My project is to organize immersive jewelry exhibitions in Hungarian schools. These exhibitions serve as a fascinating portal to the fascinating tapestry of Indonesian culture. Each gemstone on display, with its unique color and type, serves as a symbol of an Indonesian island or region. This innovative approach invites students on a visual and tactile journey through the Indonesian archipelago. The colorful and glittering exhibition will attract not only students, but all interested visitors, and with the help of the university and the student union, this event could grow into a very high-quality event. The sparkle, shine, and beauty of the jewelry will make even those who may not have heard of the exhibition before stop by to see it.

These exhibitions go beyond the mere display of gems; they provide a holistic experience that immerses students in Indonesia's rich history, traditions, and narratives. They introduce students to Indonesian geography, traditions, language, cultures, and religious diversity. Each gemstone becomes a storyteller, sharing the cultural heritage and significance of its place of origin. I aim to focus all eyes on these gems and, through them, on Indonesia. Students will not only gaze at the beauty of these gems, but will also touch, feel, and even wear them. This tangible engagement will bridge the gap between gemstones and Indonesian culture, creating a deep and personal connection. The colorful stones help students to associate more easily with a part of the culture and make the exhibition an immersive experience.

By allowing students to physically interact with these gemstones, we aim to create lasting impressions that go beyond the boundaries of the traditional classroom. With this engaging approach, we want to pique their interest and awaken their appreciation of different cultures.

5.3. Traveling exhibitions: fostering cross-cultural exchange

At the heart of the initiative is a series of engaging traveling exhibitions that will tour Hungary and introduce communities to the vibrant tapestry of Indonesian culture. These exhibitions have been carefully curated to serve as dynamic ambassadors, inviting visitors to discover the magical world of gemstones and the soul of Indonesia.

As the exhibits unfold, visitors embark on a sensory journey, immersed in the sights, sounds, and tastes of Indonesia. The intricate exhibits bring to life the essence of Indonesian tradition and allow visitors to witness the craftsmanship and artistry behind the making of the gemstone jewelry. Authentic music, evoking the rhythms of Indonesia, would fill the air, providing an immersive listening experience. Dance performances enliven the space, capturing the grace and vitality of Indonesian culture.

Beyond the visual and auditory splendor, the exhibitions tempt the taste buds with a selection of Indonesian delicacies. From the aromatic spices of rendang to the sweet lure of klepon, each bite opens a gateway to Indonesia's diverse culinary landscape. Culinary demonstrations

and tastings offer an interactive dimension, allowing visitors to savor the flavors and textures that define Indonesian cuisine. The gems themselves go beyond mere decoration. Each gemstone will carry the story of Indonesia's rich history and culture.

The aim is to show that gemstones themselves go beyond mere decoration and become an element of cultural transmission. Each gemstone will carry the story of Indonesia's rich history and cultural heritage. Interactive displays will reveal the geological origins of the gems and tell the story of how the Earth has been transformed over thousands of years. Historical artifacts and visual materials illustrate the importance of gemstones in Indonesian society, from ancient rituals to royal ornaments.

6. Challenges and Considerations

In my efforts to strengthen Indonesian-Hungarian economic and cultural relations, it is essential to recognize the nuanced challenges ahead. While the prospects are promising, this forward-looking endeavor requires careful analysis and strategic foresight.

6.1. Potential barriers to the implementation of educational initiatives

One major challenge is to organize smooth coordination between educational institutions, local authorities, and exhibition organizers. This means navigating bureaucratic processes, aligning schedules, and ensuring that all stakeholders work in harmony. Overcoming the logistical complexity of organizing exhibitions across cities and regions is essential. This requires meticulous planning to anticipate and manage all potential bottlenecks, from transport logistics to venue selection. This task requires educational experts and cultural ambassadors to work together to design an engaging and culturally enriching educational experience.

6.2. Adapting to cultural differences

Recognizing and celebrating the diverse cultural landscapes of both nations is at the forefront of my efforts to promote harmonious cooperation between Indonesia and Hungary. Both countries boast a diversity of traditions, etiquette, and communication styles that form the basis of their identities. Bridging these cultural differences requires a mix of cultural sensitivity, openness, and adaptability. Understanding the nuances of etiquette is essential to navigate social interactions. From greetings to gestures, each has its significance. For example, the Indonesian gesture of clapping one's hands together in a show of respect, known as 'salaam', carries deep cultural weight. In Hungary, a firm handshake is often a sign of trust and respect. By becoming familiar with these customs, we show a genuine interest in and respect for each other's ways of expressing ourselves. My proposed solution to this problem is to publish a catalog with basic etiquette rules. Traditions also serve as a cornerstone of cultural identity. Recognizing and appreciating the significance of holidays, ceremonies, and rituals in both Indonesian and Hungarian cultures not only deepens our understanding but also fosters a sense of shared celebration. It is through these moments that the true essence of a culture is revealed, providing invaluable insight into the beliefs and values that shape a community.⁰

⁰ Novák, T. (2018). GO HUNGARY – GO INDONESIA, Budapest Business School, University of Applied Sciences.

Effective communication is at the heart of any successful partnership. While English can serve as a common language, it is essential to be aware of linguistic subtleties and potential language barriers. The use of clear and inclusive language, complemented by visual aids and interpreters where necessary, ensures that all participants feel heard and valued.⁰

The involvement of cultural experts will prove invaluable in dealing with such complex situations. They act as a bridge, providing invaluable insight and guidance in navigating between cultures. Their expertise not only alleviates potential misunderstandings, but also paves the way for meaningful relationships based on mutual respect, curiosity, and a shared enthusiasm for learning from each other.

As we embark on this transformative journey, we must see these cultural differences not as obstacles but as seeds of growth and understanding. Each challenge we face is a testament to the resilience of our shared vision. By combining our collective creativity, ingenuity, and unwavering commitment, we stand ready to weather these considerations with grace and courage. In doing so, we will forge an unbreakable bond between Indonesia and Hungary that will resonate for generations. Together we will transcend borders and light the way to a future defined by richer economic and cultural cooperation.

6.3. Overcoming environmental challenges

In tandem with the cultural and educational initiatives, it is crucial to address the environmental challenges that both Indonesia and Hungary face, particularly in the realm of plastic waste management. Implementing sustainable practices requires a collective effort and a shift in societal attitudes toward responsible consumption and waste disposal. One of the potential hurdles is garnering widespread public support and participation in environmental conservation efforts. Overcoming ingrained habits and promoting a mindset change necessitates comprehensive public awareness campaigns that highlight the interconnectedness of environmental health with the well-being of communities.

In addition, legislative and regulatory frameworks must be considered to ensure the effective implementation of sustainable practices. Collaborative efforts should extend beyond cultural and educational spheres to involve government bodies, environmental agencies, and industry stakeholders. By fostering a supportive policy environment and encouraging corporate responsibility, the partnership can create a sustainable ecosystem that addresses environmental challenges at its roots. Furthermore, technology and innovation will play a pivotal role in developing solutions for plastic waste management. Research and development initiatives, possibly facilitated through joint ventures or academic partnerships, can pave the way for groundbreaking innovations in recycling technologies and waste reduction strategies. By acknowledging and proactively addressing these environmental challenges, the collaboration between Indonesia and Hungary can contribute to a cleaner and healthier planet, leaving a positive legacy for future generations.

⁰ Shramek, E. (2023). 10 Effective Partnership Relationship Management Tips for Success in 2024, Scaleo <https://www.scaleo.io/blog/10-tips-for-effective-partnership-relationship-management-for-success/>

7. Long-Term Impact and Sustainability

7.1. Expected impact on economic and cultural relations

Looking at the long-term impact of cooperation between Indonesia and Hungary, the prospects are promising. Economic relations are expected to strengthen, fuelled by increased trade, investment, and mutual economic growth. This initiative will not only promote economic resilience but also pave the way for cultural enrichment. Through sustained engagement, we anticipate a deepening of cultural understanding and appreciation between the two nations, leading to the development of lasting bonds.

7.2. Ensuring the continued success and sustainability of initiatives

Ensuring the long-term sustainability of these initiatives is of paramount importance for their lasting impact. This requires meticulous planning, ongoing stakeholder engagement, and a commitment to adapt and evolve to changing circumstances. Building strong partnerships within and outside Indonesia and Hungary is essential to ensure the continued success and sustainability of these educational initiatives. By building a dynamic framework, we will lay the foundation for a legacy of enhanced economic and cultural cooperation between two different nations.

7.3. Addressing environmental sustainability and plastic waste management

In addition to economic and cultural links, environmental sustainability is also a key issue, especially given the widespread problem of plastic waste in Indonesia. Recognizing the environmental challenges facing both nations, joint efforts should be made to implement effective waste management strategies. This could include developing environmentally friendly practices, recycling programs, and awareness campaigns to reduce the ecological footprint of both Indonesia and Hungary. By integrating environmentally conscious initiatives into the broader framework of cooperation, the partnership can contribute not only to economic and cultural growth but also to the shared responsibility of preserving our planet for future generations. Implementing sustainable practices alongside economic and cultural aspirations will strengthen the comprehensive and lasting nature of cooperation between Indonesia and Hungary.

7.4. Emphasizing environmental responsibility and circular economy practices

Recognizing the pressing global issue of plastic waste, Indonesia's commitment to addressing its challenges in this area can significantly contribute to the overall sustainability of the collaboration with Hungary. To tackle the plastic waste problem, joint initiatives could be established to implement comprehensive waste management systems, emphasizing recycling, waste reduction, and the promotion of eco-friendly alternatives. Education and awareness campaigns can play a crucial role in encouraging responsible consumption and waste disposal practices among the populace.

Furthermore, both countries can explore the concept of a circular economy, where the lifecycle of products is optimized, and waste is minimized through recycling and reusing materials. By integrating circular economy principles into their economic collaboration, Indonesia and Hungary can set an example for sustainable development, demonstrating that

economic growth need not come at the expense of the environment. Collaboration in research and innovation between the two nations can lead to the development of new technologies and strategies for effective plastic waste management. By fostering a shared commitment to environmental stewardship, Indonesia and Hungary can work together to create a positive impact on a global scale. This emphasis on sustainable practices not only aligns with the broader goals of the international community but also ensures that the partnership between the two nations remains forward-looking and resilient in the face of evolving challenges. Through this approach, the collaboration can serve as a model for responsible and sustainable international cooperation, leaving a lasting legacy for generations to come.

8. Conclusion

In conclusion, the project to strengthen economic and cultural ties between Indonesia and Hungary through gemstone education and exhibitions is a pioneering step towards mutual prosperity. This gemstone renaissance, centered on the interaction of natural and man-made gemstones, is not only geared toward economic change but is also an effective basis for cultural exchange.

The educational strategy, characterized by school exhibitions and mobile displays, has the potential to be transformative. These exhibitions, imbued with the vitality of Indonesian culture, will act as channels for cross-cultural interaction. Each gem, an eloquent storyteller, will chronicle Indonesia's rich history and heritage, inviting Hungarian students and visitors on a sensory journey through this diverse archipelago.

Given the fundamental challenges of enforcing such visionary design, accommodating cultural differences requires a delicate balance of perceptiveness and flexibility. Through the use of art experts and facilitators, I want to ensure that relationships are characterized by respect, curiosity, and a genuine desire to learn from each other. We see these challenges as opportunities for growth and enlightenment rather than obstacles, strengthening our shared vision.

Projections of the long-term effects of cooperation paint a picture of strengthened economic ties and richer cultural understanding. The potential impacts on economic and cultural relations are limitless, fostering mutual growth and resilience. Careful planning and continued stakeholder engagement are essential to ensure the lasting success of these initiatives. By cultivating solid partnerships, we will build a legacy of enhanced economic and cultural cooperation between Indonesia and Hungary.

In this gemstone renaissance, where the glitter of gemstones reflects the vitality of Indonesian and Hungarian culture, we face a future of strengthened economic and cultural ties. Through the gemstones we adorn, we carry not only the beauty of Indonesia but also the promise of a more connected world. Together we cross borders, lighting the way to a future of unity, curiosity, and cultural appreciation.

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Projects in the hope of improving Hungarian-Indonesian relations – a deep dive into the possibilities offered by Indonesia’s cultural heritage

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1. Abstract

The paper provides a comprehensive overview of Indonesia, delving into its geography, culture, economy, diplomacy, collaboration with Hungary, recent projects, vision, and proposed additional projects. It describes Indonesia as a culturally diverse nation with over 700 languages, boasting rich traditions and a varied cultural landscape. The country's economy is highlighted, emphasizing its natural resources and the need for sustainable development. The paper outlines Indonesia's diplomatic positioning and its potential role as a bridge for Hungary in the East-Asian sector. It also discusses recent collaborative projects between Hungary and Indonesia, particularly in the areas of water management, food safety, ICT technologies, and the HunIndoTech initiative. Furthermore, it introduces the Hunklung Foundation as a cultural partnership between Hungary and Indonesia, aiming to promote cultural exchange, educational programs, and serve as a cooperation hub. Additional proposed projects include extending the Hungary Helps Program, digital healthcare collaborations, and exploring potential partnerships in unique cultural practices. The author also shares their personal experiences and insights from a visit to Indonesia, highlighting diplomatic engagements, economic insights, and the potential for healthcare and educational exchanges between the two countries. Overall, the paper offers a comprehensive view of Indonesia and outlines various opportunities for collaboration and mutual growth between Indonesia and Hungary.

2. Introduction

2.1. Geography and Culture

Indonesia, one of the world’s biggest countries spanning from mainland Asia almost all the way to the continent of Australia stands as one of the most culturally diverse nations on our planet. Home to more than 700 languages, it is a melting pot of traditions and histories, offering a rich ground for exploration and understanding. The official language is Indonesian, which is based on Malay and is a mixture of past colonizers' languages, although hundreds of other regional languages are also spoken in the country. The great majority of the population is of Islamic faith, but there are also significant Christian, Hindu, and Buddhist minorities which still hold important cultural elements of Indonesia's mixed culture. This nation is the fourth most populous country globally, with a significant concentration, 56%, residing on the island of Java, which holds the record for the highest population density on an island worldwide. The geographical landscape of Indonesia is as diverse as its culture, with over

17,500 islands, among these, 6,000 remain uninhabited, a silent testimony to the vastness of the Indonesian territory. The archipelago is home to numerous volcanoes, a force of nature that has significantly influenced the region's geographical and cultural landscape.

2.2. Economy

Indonesia has the most substantial economy in Southeast Asia, fueled by a swiftly expanding middle class and a notable consumer market. The country is rich in natural resources, including coal, petroleum, and natural gas, establishing itself as a prominent producer of agricultural products such as palm oil, coal, and rubber. However, the economic ascent is met with considerable challenges including persistent poverty, an overgrowing economy, and environmental degradation. These pressing issues are central concerns that need strategic interventions for sustainable development. The 3 main paths to follow for President Joko Widodo are: upscaling infrastructural projects, increasing public saving through a more comprehensive tax strategy, and business climate reforms that promote anti-protectionism around the country's investors.⁰ Not an easy job considering China's strong influence and rivalry on the Island country, its unique law system built upon Dutch law, and imagine all this with a mainly Arabic culture. Despite these hurdles, Indonesia remains a favored destination for travelers, thanks to its rich cultural heritage, stunning natural landscapes, and the renowned hospitality of its people. This paints a picture of a nation with untapped potential, offering vast opportunities for collaborations in various sectors.

2.3. Diplomacy

According to a statement made by the Indonesian president, his country aims to become the world's 4th biggest economy by 2045, right when Indonesia will celebrate its 100th anniversary of independence. Indonesia is an important member of the G20, a founding member of ASEAN and the EAS. Not only has Indonesia been an active member of several bilateral relations, but it is also a founding member of the Non-Aligned Movement as well, which closely correlates with Hungary's diplomatic positioning as the political world is becoming more and more polarised.

2.4. Collaboration

Seeing that Hungary is trying to diversify its imports and exports, it's worth taking a deeper look at Indonesia. Considering the above-mentioned goals and diplomatic open-mindedness which we can see since 1945, Indonesia could become our bridge into the rapidly evolving East-Asian sector. Vice-versa Hungary can offer great opportunities for Indonesia's expansion towards the EU, like investments, scholarships, and European technological exports. Hungary already has close cooperation with Indonesia: the Hungarian embassy has 7 Hungarian associates working in Jakarta, which is greatly above average, and in 2021 Hungary passed a law that enables - among other countries - Indonesian workers to rapidly get their working permit in Hungary.⁰ However, cooperation reaches further than the import of the Indonesian workforce.

⁰ Rajah, R. (2018). Indonesia's economy: Between growth and stability, Lowy Institute for International Policy <https://www.jstor.org/stable/resrep19789>

⁰ Embassy of Hungary Jakarta (2023) <https://jakarta.mfa.gov.hu/eng>

2.5. Recent projects

In recent years, Hungary has fostered several substantial economic projects in Indonesia, marking a significant chapter in the bilateral relations of the two nations. In 2013, Hungary spearheaded a pivotal water management initiative, reaching 36 Indonesian cities and approximately 300,000 inhabitants through the deployment of mobile water cleaning facilities. This endeavor went beyond mere provision; it was a new kind of knowledge where Hungarian expertise in water management was shared to enhance the water systems, enabling a healthier living environment for Indonesians.⁰

In the city of Yogyakarta, a significant stride was made in the domain of food safety with the introduction of isotope food gamma irradiator technologies. This initiative has been instrumental in elevating food safety standards, ensuring prolonged freshness, and enhancing the shelf life of various products, thereby contributing positively to this important export and public health sector.

Moreover, Hungary facilitated the growth of small enterprises in Indonesia through the infusion of ICT technologies. This strategic move was designed to empower small business owners with modern tools and knowledge, fostering a competitive edge in the market and encouraging economic resilience, thereby nurturing entrepreneurial success.⁰ A cornerstone in this collaborative journey is the ongoing development of the Multi-Lane Free Flow electronic toll payment system, a project buoyed by an investment nearing 300 million USD.⁰ This initiative stands as a testament to Hungary's technological expertise, promising to revolutionize Indonesia's road network efficiency and potentially emerging as Hungary's most significant technological export in history, a beacon of innovation and bilateral economic diplomacy.⁰

The flagship project between the two countries is the HunIndoTech initiative, which has operated as a shared, technological cooperation innovation hub since 2018. It enabled companies like the Hungarian startup Festipay, to broaden their scope as becoming a transcontinental company.⁰ Furthermore, the hunindotech forum is organizing incubator events every 2-3 years in the hopes of sparking new interests from both countries' emerging startups and companies. No surprise that Hungarian diplomatic visits have nearly tripled since the foundation of this project.⁰

⁰ Kormányzat, (2023). A KKM társfinanszírozásában megvalósult mobil víztisztító megkezdte működését Indonéziában <https://2015-2019.kormany.hu/hu/kulgaszdasagi-es-kulugyminiszterium/hirek/a-magyar-koros-consult-kft-es-indonez-partnere-a-pt-aidi-inti-mandiri-solutions-atadott-egy-mobil-viztisztito-berendezest-az-indonezjai-papua-tartomanyban>

⁰ ICT Global (2023). Magyar-indonéz megállapodás a blokklánc technológiák hasznosítására <https://ictglobal.hu/rovid-hirek/magyar-indonez-megallapodas-a-blokklanc-technologiak-hasznositasara/>

⁰ Business Indonesia, (2023) Indonesia pushes onwards on implementation of MLFF Toll Road System <https://business-indonesia.org/news/indonesia-pushes-onwards-on-implementation-of-mlff-toll-road-system>

⁰ Portfolio.hu, (2021). Sikersztori: Magyarok építik ki és üzemeltetik az indonéz útdíjrendszert <https://www.portfolio.hu/gazdasag/20210130/sikersztori-magyarok-epitik-ki-es-uzemeltetik-az-indonez-utdijrendszert-467534>

⁰ FestiPay, (2020). Festipay joins the online HunIndoTech Business Forum in Jakarta <https://festipay.com/festipay-joins-online-business-forum-hunindotech-jakarta/>

⁰ HunIndoTech – Technology-based Hungarian-Indonesian Business Forum. (2024). <https://www.hunindotech.id/>

As we analyze this collaborative trajectory, it becomes evident that the Hungary-Indonesia partnership is grounded in innovation, sustainability, and a shared vision for progress. These projects, each significant in its scope, paint a promising landscape for the bilateral relationship, showcasing a partnership that leverages technology for development and fosters a spirit of collaborative growth, holding a promising future laden with opportunities for mutual growth and development.

2.6. Vision

To bring this partnership to completion, we must implement new strategies and use our cultural diversities and similarities for good. Using culture is a way of showing the world our openness for sharing and learning from each other. Seeing that Indo-Hungarian diplomacy still lacks cultural exchanges and projects, I want to start by sharing my ideas about possible cultural-educational projects and then move on with proposals that could broaden the horizon of both countries' economic collaboration.

3. Hunklung Foundation

The Hunklung Foundation is a multi-purpose cultural partnership between Hungary and Indonesia. The main goal of the foundation is to keep both cultures afloat as both countries step into a new era of globalization. This collaboration is key because both countries have a lot to modernize while having guarded their heritage for nearly a millennium.

The name of the foundation is derived from the Indonesian "Angklung" instrument, which can only produce a single tone, and can only be played in an ensemble.⁰ Just as an orchestra of Angklungs creates harmony, the Hungary-Indonesia collaboration aims to foster mutual growth, symbolizing unity, and concerted effort in achieving a common goal. It's a metaphor that speaks to the potential of working hand in hand, creating a richer outcome together.

This cultural project will operate similarly to the Hungarian Liszt Institute but differs in the goals it wants to achieve. It aims for both countries' equal engagement in the project, more like the already successful Hunindotech initiative, which is funded by both two partner countries. The foundation will concentrate on three main areas:

3.1. Cultural exchange

As both countries have a deep cultural heritage and mutual international goals, it is worth organizing events like Indonesian concerts in the Hungarian House of Music. Through personal inquiries, I learned that Indonesian students are hungry to learn about new things in a more collectivist nation, so it's possible that recurring Hungarian folk dance gatherings (in Hungarian: *Táncház*) would be a huge success in Jakarta as well. Moreover, the foundation could fund projects like translating Hungarian literature into Indonesian, and vice-versa, seeing that the Hungarian "János Vitéz" already won the heart of the Indonesian audience in Jakarta.

⁰ UNESCO (2023). Indonesian Angklung <https://ich.unesco.org/en/RL/indonesian-angklung-00393>

3.2. Exchange programs

Firstly, the partnership would act as a forum, where students can find the already existing Darmasiswa and Stipendium Hungaricum scholarships. These two scholarships have already provided hundreds of students with the opportunity to elevate their studies in the partner country, thereby combining the knowledge of the two nations.⁰ Another already existing partnership is a collaboration between the Hungarian National Bank and Budapest Business School, which offers Indonesian language courses. It can be said that there is more needed: On the Hungarian side, economics and social studies fields should offer regional studies courses about Indonesia, and law faculties should offer Islamic law courses in cooperation with Indonesian universities, as these universities have Islamic law as a compulsory course. These would greatly contribute to future projects with Indonesia as they have a special way of conducting business, but also long-standing relations with China and Singapore.⁰ Hungary could offer courses related to Christian and European culture to help Indonesia get more acclimatized to the middle-European sector.

Another promising avenue for collaboration lies in creating ties between universities like MOME Budapest and the Jakarta Institute for Arts, institutions that resonate with shared interests in the rich tapestries of art and culture. Envision a vibrant exchange program, where ten budding artists from Budapest immerse themselves in Indonesian Batik, while an equal number from Jakarta delve into the traditional Hungarian embroidery, known as “Hímzés”. This reciprocal learning experience promises to be a fertile ground for cross-cultural understanding, nurturing a deeper appreciation and involvement in each other's artistic landscapes, thereby weaving a tapestry of shared experiences and enriched knowledge through the language of art.

Furthermore, the Hunklung Foundation is designed to extend beyond the boundaries of cultural cooperation, envisioning a robust framework for educational exchange that encompasses a broader spectrum of disciplines. A significant pillar of this initiative would be the facilitation of postgraduate healthcare vocational training, fostering a symbiotic relationship where Hungarian physicians could delve into the rich traditions of Asian medicine, and Indonesian counterparts could gain a profound understanding of the advancements in European medical practices. This initiative is not just about academic enrichment; it envisages nurturing a spirit of volunteerism among students, encouraging them to immerse themselves in community services, thereby broadening their medical horizons. It is a step towards cultivating a cadre of healthcare professionals equipped with a global perspective, ready to navigate the complex landscape of modern healthcare with a rich tapestry of knowledge gleaned from the best of both worlds.

3.3. Cooperation hub

All this would be possible thanks to the collaboration hub, which stands as the heart of the Hunklung Foundation, serving as a dynamic platform that brings together a wealth of opportunities and connections from both Hungary and Indonesia. At its core is the foundation's website, designed to be a user-friendly space where people can find a wide array of cultural contacts and information easily and quickly. It aims to showcase every event,

⁰ Embassy of Hungary Jakarta (2023) <https://jakarta.mfa.gov.hu/eng>

⁰ Novák, T. (2018). GO HUNGARY – GO INDONESIA, Budapest Business School, University of Applied Sciences.

partnership, exchange program, and opportunity that the Hungarian and Indonesian cultures have to offer, presented in a way that is mutually understandable to people from both nations.

For instance, the Hungarian Film Institute (NFI) could forge a partnership with the foundation, encouraging filmmakers to explore the diverse and economical filming locations that Indonesia has to offer, which stands as one of the most affordable in Asia. This initiative could open up a world of possibilities for filmmakers, offering a rich tapestry of backgrounds for their projects, from lush jungles to vibrant cities, providing a fresh and diverse backdrop for Hungarian cinema. The collaboration hub, therefore, is not just a platform but a community, bringing together individuals and organizations with a keen interest in fostering ties between the two countries, creating a space where ideas can be exchanged, and collaborative projects can take root, all facilitated through the website and through events that bring stakeholders together in a spirit of mutual interest and cooperation.

To recap, the Hunklung Foundation, inspired by the collaborative spirit of Indonesian "Angklung" music, is poised to become a central figure in enhancing Hungarian-Indonesian relations. It seeks to be a hub of vibrant and diverse activities, a place where educational and cultural initiatives find a home alongside economic collaborations, all accessible through a straightforward and intuitive website. As we envision its future, the foundation is more than a bridge between two nations; it is a catalyst for new beginnings, encouraging understanding and shared experiences through a rich array of programs and opportunities. Even as a budding concept, it stands as a testament to Hungary's proactive approach towards forging a deeper connection with Indonesia, showcasing a readiness to embrace a partnership rich with potential for economic synergy and cultural enrichment.

4. Additional Projects

4.1. Extending Hungary Helps Program

The Hungary Helps Program, known for its humanitarian outreach globally, holds untapped potential in fostering deeper Hungary-Indonesia relations. Indonesia, prone to natural disasters due to its geographical location in the Pacific Ring of Fire, and home to remote areas with limited access to advanced medical facilities, presents a viable ground for the program's expansion.⁰

The initiative could see Hungarian volunteers bringing extensive knowledge and aid to these regions, enhancing community resilience through education and healthcare advancements. Furthermore, the program could significantly benefit the Christian communities in Indonesia, which make up about 10% of the population. Particularly in regions like Yogyakarta, the rise of extremist groups such as the Islamic Defenders Front (FJI) is a growing concern.⁰ The Hungary Helps Program, with its history of aiding Christian communities under threat, could work towards ensuring the safety and well-being of these communities, while promoting peaceful coexistence. This initiative could also open up avenues for Hungarian volunteers to

⁰ Natural disasters in Indonesia, (2023) Statista <https://www.statista.com/topics/8305/natural-disasters-in-indonesia/>

⁰ Vasa G. Z. (2021). A legkisebb jogi kapukat is betömködnék Indonéziában, ellehetetlenítve a keresztényeket, Vasárnap.hu <https://vasarnap.hu/2021/02/20/a-legkisebb-jogi-kapukat-is-betomkodnek-indoneziaban-ellehetetlenitve-a-keresztenyeket/>

immerse themselves in a new cultural setting, fostering a spirit of global community and understanding.

4.2. Digital Healthcare

In recent years, the healthcare sector has witnessed a transformative shift towards digitalization, a trend that has been significantly pronounced in both Hungary and Indonesia, each bringing a rich repository of innovations and strategies to the table. Hungary, home to the globally recognized Semmelweis University, has been a powerhouse in European health inventions, fostering a landscape ripe with potential for knowledge export in the healthcare domain.

Indonesia, grappling with healthcare challenges exacerbated by its vast geographical spread, has embraced digital healthcare as a potent solution. A pivotal move in this direction has been the collaboration between the Indonesian government and BPJS Kesehatan, the dominant player in Indonesia's healthcare, resulting in the creation of the Mobile JKN app. This initiative set an ambitious target of achieving 90% user coverage by 2019, a goal that has seen substantial realization with the app boasting around 186 million users out of a population of approximately 260 million. The app stands as a linchpin in the Indonesian healthcare system, offering a range of features including instant access to digital healthcare documents, locating the nearest hospitals, and delivering crucial notifications tailored to the user's health statistics and location.

Hungary harbors the potential to augment this digital healthcare trajectory through the integration of features from its native apps, "ÉletMentő" and "Gyermek Elsősegély". These apps have garnered acclaim for their first-aid functionalities, offering users step-by-step instructions, complemented by animated graphics, to handle emergencies effectively. Particularly, the "Gyermek Elsősegély" app facilitates swift symptom searches, guiding users with official protocols to administer immediate aid personally.

A promising avenue for collaboration lies in the potential integration of these first-aid features into the Mobile JKN app, addressing the pressing issue of healthcare accessibility in Indonesia's remote regions. On the other hand, the Hungarian apps could benefit immensely from adopting Mobile JKN's link to health insurance offices, allowing users to manage their membership statuses seamlessly, a feature that stands as a testament to the app's user-centric, and interconnected design, enabled by a great coverage of 86% internet users in this huge country.

Furthermore, the incorporation of a smart emergency call feature could revolutionize emergency responses, with the app automatically sharing critical information such as the user's location, health details, and phone battery status with medical centers during emergency calls, which is already a working feature in Hungary.

In essence, a collaborative endeavor in digital healthcare stands as a fertile ground for enhancing Hungarian-Indonesian relations, fostering a symbiotic relationship where knowledge exchange paves the way for healthcare innovations tailored to meet the unique demands of each nation's populace. This venture not only promises to elevate healthcare standards but also opens up avenues for (again) deeper cooperation.

4.3. Torajan funeral rites

The Torajan death rituals were introduced to me via personal inquiries and it revealed an unusual similarity to a Hungarian practice.⁰

In exploring the rich cultural practices of Indonesia, one cannot overlook the distinctive funeral rites of these people, a community that maintains a profoundly interactive relationship with their deceased relatives, often documented through photographs shared on platforms such as Instagram. Torajan people keep their dead relatives inside their houses until the time of the yearly ceremony comes. At the ceremony, the Torajan people take their deceased loved ones out of their corpses to celebrate with them, offering them food, drinks, and cigarettes as a gesture of reverence and to maintain a tangible connection with them. This practice, albeit unusual from a European perspective, finds a curious parallel in Hungary through the interesting approach of a company named "Lapidaris." This enterprise has pioneered the integration of technology into the mourning process, introducing smart NFC tags to gravestones, thereby providing a more interactive commemorative experience. When we compare these two practices, which are distinct yet bear a strange resemblance in their approach to interaction with the deceased, a potential avenue for collaboration unveils itself. The Torajan community, already embracing a close bond with their deceased through tangible interactions, might find the services of Lapidaris to be a fitting extension, taking their interactive rituals to a technologically advanced level.⁰

This idea not only showcases the innovative prowess of Hungarian ventures but also respectfully acknowledges the deep-rooted Indonesian rituals, carving a pathway where tradition gracefully intertwines with modernity.

5. Conclusion

Indonesia stands as a powerhouse in Southeast Asia, harboring a rapidly growing middle class and a rich reservoir of natural resources. The ambitious vision of President Joko Widodo for the country to ascend as the world's fourth-largest economy by 2045 paints a picture of a nation on the rise, offering a fertile ground for economic collaborations, including potential partnerships in digitalisation, sustainability, and healthcare.

The political landscape of Indonesia is characterized by its active participation in various international coalitions, including being a founding member of the Non-Aligned Movement, which aligns well with Hungary's diplomatic stance, a great catalysator for this bilateral relationship to emerge. The prospective relocation of Indonesia's capital to the smart city of Nusantara also opens up avenues for Hungary to play a significant role if the project proves to be successful.

Indonesia is a melting pot of diverse cultures, home to over 700 languages and a rich tapestry of traditions and histories. The deep-rooted cultural practices, such as but not limited to unique fine art, dances, music and religious rituals, offer a glimpse into the country's diversity bowing down before the its motto: "Unity in Diversity".

⁰ National Geographic (Director), (2016). Here, Living With Dead Bodies for Weeks—Or Years—Is Tradition | National Geographic https://www.youtube.com/watch?v=hCKDsJLt_qU

⁰ Lapidaris.com (2023). Mi a Lapidaris kő? <https://lapidaris.com/hu/mi-a-lapidaris-ko>

While Hungary has a rich cultural heritage, it differs significantly from Indonesia in terms of geographical diversity and population density. The unique Indonesian practices, such as their interactive relationship with the deceased, stand as a testament to the deep cultural divergences between the two nations. Despite the differences I think there exists a ground of similarity in the value both countries place on cultural heritage and the spirit of innovation, as seen in the collaborative projects like the Hunindotech initiative, fostering technological cooperation and knowledge sharing.

Meeting people living on the other side of the earth and experiencing the economic opportunities firsthand as an economics student is incredibly exciting. I am eager to immerse myself in the rich cultural narratives of one of the Cub Tigers, broaden my perspective, and help Hungarian diplomacy pave its way through the entire world.

6. Aftermath

Following my journey to Indonesia, a land vividly described in this paper, I found my experiences reshaping my understanding of the ASEAN region. The anticipation of exploring Indonesia, a nation I had only encountered in pages and through narratives, transformed into a tangible adventure, offering fresh insights and perspectives.

6.1. Jakarta: a contrast of beauty and reality

Upon arrival in Jakarta, the cultural immersion continued. I was struck by the harmonious chaos, with large families navigating through check-ins, a vivid illustration of the familial bonds in Indonesian culture. The juxtaposition of the opulent skyscraper hotels and the stark reality of wealth disparity on the streets below was jarring. This visible divide between the affluent and the impoverished underscored the economic challenges facing the country. Yet, the interaction between these diverse social strata conveyed a sense of mutual respect and hope, reinforcing my belief in Indonesia's potential to ascend economically.

6.2. Diplomatic engagements and Economic Insights

Our visit to the foreign ministry provided valuable insights into Indonesia's robust economy during the pandemic, attributed to its strong ASEAN ties and the Non-Aligned Movement. The ministry's openness to Western orientation in trade revealed potential avenues for Hungary-Indonesia cooperation. The discussions around film industry collaborations and water management technologies further cemented the foundation for my Hunklung project ideas. At the Indonesian Trade Association, the revelation of Indonesia's new Nickel policy was a striking example of the nation's strategic shift towards safeguarding its natural resources. This policy, restricting Nickel exports to encourage domestic manufacturing, aligns well with Hungary's growing expertise in battery manufacturing, opening doors for mutually beneficial collaborations.

6.3. Healthcare and educational exchanges

The possibility of partnering in digital healthcare was another area of potential cooperation. The Indonesians' interest in Hungarian advancements in this field, and their willingness to share their digital health identity solutions, showed a reciprocal eagerness for technological exchange. But all in all, I would say our visit to Yogyakarta's universities were the most impactful. Conversations with students not only provided a sense of belonging but also

solidified my business and cooperation ideas. These interactions, still ongoing through messages, have fostered lasting connections, underscoring the importance of people-to-people ties in diplomacy.

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