

## Chapter 19

# Conclusions and General Recommendations Regarding Environment and Technology as the Foundation for National Development

Rahmat Trialih, Fefi Eka Wardiani, Rendy Anggriawan, Cendra Devayana Putra, & Ahmad Said

As discussed in the articles in this book, one significant conclusion can be drawn that the environment and technology are vital in building Indonesia's sustainable development. The COVID-19 pandemic has affected the entire world and has threatened the economic situation and people's lives. We should look at this situation as an opportunity to take advantage. Therefore, this situation can be our starting point to focus on national development through nature and the power of technology. This concept is certainly in line with the national recovery program that the government has designed.

We see that this national recovery strategy is very focused on economic recovery. However, we understand that building a sound economy requires foresight in seeing business opportunities and needs

---

R. Trialih, F. E. Wardiani, & A. Said  
University College Cork, Ireland, e-mail: rtrialih@gmail.com

© 2022 Overseas Indonesian Student's Alliance & BRIN Publishing  
Trialih, R., Wardiani, F. E., Anggriawan, R., Putra, C. D., & Said, A. (2022). Conclusions and general recommendations regarding environment and technology as the foundation for national development. In R. Trialih, F. E. Wardiani, R. Anggriawan, C. D. Putra, & A. Said (Eds.), *Indonesia post-pandemic outlook: Environment and technology role for Indonesia development* (331–337). DOI: 10.55981/brin.538.c513 ISBN: 978-623-7425-85-4 E-ISBN: 978-623-7425-89-2

to build a foundation by leveraging this country's advantages and combining them with current technological developments. We need to involve at least five parties, namely the government, academia, industry, society, and the community, to realize this (Sukarno et al., 2019). This concept is known as the Penta helix concept. Communication between these five parties will help us understand what we have planned faster because of the balanced integration and synergy. Here we see that these five parties need to understand our power. We believe that Indonesia is endowed with a great natural environment in this concept. If we can take advantage of this, we will have momentum that other countries do not necessarily have. In addition, current technological developments have reached a point where they can transform people's lives in various sectors. Through this, if we can see the potential of technology and use it properly, the lives of Indonesian people can be well supported, and society 5.0 can be realized.

We note that at least some essential points are critical to the success of the Penta helix concept, especially in the technology and environmental sectors (Caraka et al., 2021; Upe et al., 2021). First, in building disaster prevention and greening management. We can take advantage of nature-based solutions, remediation of heavy metals, and geomorphological watersheds. Second, we will need the technology to solve the wastewater, air pollution, and textile to achieve the ideal waste and pollution management development. We also need to regulate microplastic and reduce carbon emissions. Third, we see that building food defense and security development requires an understanding of new technologies such as the internet of things (IoT) or the concept of supply chain management (SCM), then linking it to the target of the UN research roadmap. Lastly, we propose the idea of human resource and public service development which consists of services to the community through education technology, transportation technology, data security technology, and adequate health service technology. In general, we feel that this achievement will require the involvement and synergy of all stakeholders.

Other than that, we also offer recommendations for the relevant stakeholders in this chapter. These recommendations and suggestions are closely related to the role of the environment and technology in the sustainable development of Indonesia after the COVID-19 pandemic. The following are recommendations for the environment and technology as the foundation for sustainable development.

### **1. Environment Role**

For Sustainable Development, there are some points from the various multidiscipline backgrounds.

- a. Mitigating the climate threat requires comprehensive undertakings from all contributing sectors. Regrettably, the chemical industry is one area that tends to be overlooked by many. As the global transition to the green industry is inevitable, the Indonesian government must act post-haste to prepare the country's infrastructure and human resources. Besides, this pandemic can kick off a momentous shift toward developing a greener economic system.
- b. The harmony of the self-prevention movement and the role of the community is essential in reducing the number of microplastics in the environment. Furthermore, the government should pay attention to the distribution of microplastics and start evaluating and monitoring their existence while it is still in the early stage to prevent bigger impacts in the future. There is no harm in educating, outreaching, and preventing microplastics to minimize the possible effects of their existence.
- c. The sustainability of the land is in our collective hands, so we must protect this limited resource for the sake of future generations' continuity. Land restoration based on bioremediation, which combines the principles of nature-based solutions and the circular economy, will generate a long-term benefit. Harmonization of environmental standards requests to assist fathom important natural goals worldwide. New, cheap, and proficient remediation strategies ought to be looked for.

- d. Although the end date of the Covid-19 pandemic is unknown, its impact has been felt thus far. This will have a direct effect on the community's food security. Indonesia needs to reconsider some efforts to increase the availability of high-quality food ingredients in quantity and quality. Extensification of cultivation on marginal coastal sandy land is the best option for increasing food availability in Indonesia's declining productive land. Furthermore, Improving agricultural land ecosystems necessitates positive collaboration from diverse stakeholders and society. Smart packaging and larger IoT development help reduce food waste. This platform enables the extension of storage and the transition of duration and product life communication from static coding systems to more real-time applications, albeit at a cost.
- e. The RUSLE model has proven a good method for estimating soil erosion supported by GIS software and satellite image data. Based on the soil loss calculation, the area with high or severe risk needs further attention for mitigation purposes. Moreover, the integrated biochar industry for Indonesian rural area households has the potential to achieve the Nationally Determined Contributions (NDCs) implementation targets according to the Paris Agreement.

## **2. Technology Role**

- a. For Sustainable Development in Education Sector
  - 1) Implementing KMS requires investment and development in five supporting elements, namely people, process, technology, structure, and culture
  - 2) It is necessary to have a good roadmap in the development of KMS, starting from the establishment of objective programs to the framework for evaluation and measurement as a primary material for improvement

- 3) In building an adequate information system, it is necessary to consider the system, the quality of information, and service because these can affect the sustainability of use and user satisfaction.
- b. For Sustainable Development in Medical Sector
- 1) In Hospital information systems, information is a critical component that cannot be replaced, so this system must provide accurate, updated, and secure information.
  - 2) In the development of hospital information systems, it is hoped that there will be a system that is adaptable and flexible to changes and developments in hospital capabilities
  - 3) A hospital information system needs to have seven core components, namely online appointments, payment modules, laboratory integration, pharmacy integration, emergency department integration, intensive care unit modules, and electronic medical record modules
  - 4) The development of AI technology, big data, and the internet of things enables the transformation of the hospital system in Indonesia
  - 5) Building electronic health records in Indonesia requires the involvement of stakeholders from clinical staff, changes in organizational policies, and workflow processes
  - 6) Electronic health records must ensure that this system is built according to security and privacy standards and provides no redundancy of patient data even in different hospital environments.
- c. For Sustainable Development in Transportation Sector
- 1) Building a quality transportation system should be started by having transportation infrastructure with smart mobility and sustainable vehicle promotion

- 2) In encouraging public awareness to use public transportation, it is necessary to build an integrated transportation facility between types of vehicles and routes and schedules that run in harmony
  - 3) The use of a centralized data system for transportation needs to be considered by the government as the foundation for the development of excellent and reliable public transportation
- d. For Sustainable Development in Agriculture Sector
- 1) Data is an essential element in building a food balance in Indonesia, and of course, food data is needed starting from the data of suppliers, and the data of imports until import facilities
  - 2) The development of a food supply chain in the post-pandemic era may involve the use of robotic systems to replace human labor
  - 3) It is necessary to develop an optimal food transportation route so that it can save costs and maximize the delivery time of staple foods
- e. For Sustainable Development in Government Sector
- 1) In building a blockchain system in government, it is necessary to involve relevant stakeholders, especially from the government, academia, and the community
  - 2) The use of blockchain for government can help current government systems such as voting, taxes, non-profit agencies, cybersecurity, and big data

We cannot deny that natural wealth is one of Indonesia's gifts. In addition, technological developments have also become an enabler for a country to transform into a developed country. The progress of a country can not only rely on the government's efforts, but there needs to be a good synergy among all related stakeholders. Good harmony and synergy between the government, academia, society, community, and industry is the key to Indonesia's ability to survive

and become a better country, especially after the COVID-19 pandemic era. This pandemic can be either a threat or an opportunity in challenging situations. Therefore, related stakeholders need to turn this threat into an opportunity. Moreover, they all need to continue understanding technological advances actively and maximizing our country's potential, such as natural resources and the environment. Based on this, we believe that the environment and technology can be the primary weapons for Indonesia in carrying out sustainable development, especially in this post-pandemic.

## References

- Caraka, R. E., Noh, M., Chen, R. C., Lee, Y., Gio, P. U., & Pardamean, B. (2021). Connecting climate and communicable disease to penta helix using hierarchical likelihood structural equation modelling. *Symmetry*, *13*(4), 657. <https://doi.org/10.3390/sym13040657>
- Sukarno, G., Rasyidah, R., & Saadah, K. (2020). Improve creative industry competitiveness penta helix and human capital in digital era. *Advances in Social Science, Education and Humanities Research. Proceedings of the 2nd International Media Conference 2019*. <https://doi.org/10.2991/assehr.k.200325.014>
- Upe, A., Ibrahim, Z., Arsyad, M., Sumandiyar, A., & Jabar, A. S. (2021). Strengthening of social capital through penta helix model in handling Covid-19 pandemic. *International Journal of Pharmaceutical Research*, *13*(1), 4243–4248. <https://doi.org/10.31838/ijpr/2021.13.01.635>