



Dialogues on Sustainable Development between Europe and Asia

The Next Gen EU-ASEAN
Think Tank Dialogue



Co-funded by
the European
Union



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FOREWORD

The concept of sustainable development has long been a cornerstone of global efforts to reduce poverty, ensure a healthy environment and foster economic growth. It is a vision of a future world in which people, the environment, and our economies can all thrive together.

In 2015, the world leaders adopted the 2030 Global Agenda for Sustainable Development. Time is running out to realise the 17 goals of the agenda. The COVID-19 pandemic and the escalating war in Ukraine have disrupted or even derailed the progress towards the achievement of the goals.

In recent years, there have been efforts by the European Union (EU) and the Association of Southeast Asian Nations (ASEAN) in developing sustainable policies, practices, and projects that have the potential to make our planet a healthier and more prosperous place for generations to come. However, much more needs to be done to realise the full potential of the sustainable development agenda.

This book is part of a three-volume set of research papers produced under the project “Think Next, Act Next – The Next Gen EU-ASEAN Think Tank Dialogue” (EANGAGE), which aims to encourage greater collaboration between the EU and ASEAN, inspire joint research and foster greater awareness of the EU’s engagement in the ASEAN region. Co-funded by the European Union, the two-year project was launched in 2021. The Asian Vision Institute, Cambodia is honoured to be one of the partners for this project, and focused on research in the area of sustainable development. The two other partners for the project, the Konrad-Adenauer-Stiftung (with its Regional Programme Political Dialogue Asia) and the Diplomatic Academy of Vietnam, were responsible for facilitating research in the areas of connectivity and security respectively.

This book is a compilation of papers under the Sustainable Development cluster of the EANGAGE project. The book reflects the efforts, dedication, and teamwork spirit of the young think tankers from ASEAN and the European Union to unpack and provide solutions to sustainable development challenges in the two regions.

As Southeast Asia and Europe are becoming increasingly interconnected and complex, cooperation on sustainable development is even more relevant. Both regions can share best practices and provide an essential framework for achieving a more equitable, prosperous, and secure future.

From the ways in which we use resources and manage our environment, to the ways in which international relations, economic systems, and development goals are managed, sustainable development is a powerful tool for driving positive change. This book is a comprehensive and accessible guide to case studies relating to sustainable development, and to the implementation of sustainable development policies in the real world.

The authors have brought together a wealth of knowledge and experience in the field of sustainable development by synthesising the vast body of knowledge on sustainable development into a comprehensive and accessible resource. The authors have provided insightful analysis of the challenges and opportunities that lie ahead and presented their insights in an engaging and practical way. This book will be an invaluable resource for researchers, students, policymakers, and practitioners alike.

Sustainable development is the only viable path forward for our planet. It is essential that we work together to ensure that we humans can live in harmony with our environment, while also providing shared economic opportunities and common security.



Dr. Vannarith Chheang
President
Asian Vision Institute

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The publication is the outcome of close cooperation and teamwork between the consortium partners, the Konrad-Adenauer-Stiftung, the Asian Vision Institute (AVI) and the Diplomatic Academy of Vietnam (DAV). The project leaders for each of the consortium partners – Konrad-Adenauer-Stiftung, Singapore, Asian Vision Institute and the Diplomatic Academy of Vietnam – provided critical advice and direction for the project, including this publication. The project was also ably supported by the EU Projects Team at the Konrad-Adenauer-Stiftung, Berlin.

The programme managers for each cluster, connectivity, sustainable development and security, worked tirelessly to produce this volume. The programme managers were responsible for coordinating the research with all the fellows involved, including facilitating the mentoring of the research pa-

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01

**Leveraging Innovative
Tools to Engage Citizens
in Building Smarter Cities
in ASEAN and the EU**

Nadina Iacob

Abstract

Digitalisation has been opening novel ways of building smarter and more sustainable cities. In the transformative process of rendering cities smarter, more sustainable, and more resilient, engaging citizens effectively in local policymaking is a key component of mapping issues, crowdsourcing ideas and solutions, and contributing to the effective implementation of smart city initiatives. As cities seek to adapt to changing needs and the challenges of tomorrow, the exchange of best practices between cities can help accelerate the transformative process and better tap existing knowledge and learnings.

Against this background, this paper seeks to investigate the role of citizen participation in smart city strategies in the Association of Southeast Asian Nations (ASEAN) and the European Union (EU), with a view to supporting cooperation and knowledge exchange across regions. Smart city strategies have been key components of the policy agendas of both ASEAN and the EU, and more recently a relevant element of the ASEAN-EU strategic partnership. In addition, in creating smarter cities, the role of citizen participation has been recognised to different extents in the two regions. In this context, the paper takes stock of measures to facilitate how citizens contribute to decision-making in smart cities. The paper relies on an extensive review of literature and policy developments, as well as two case studies deriving insights from examples of citizen participation in local policymaking for smart cities in ASEAN and the EU.

Based on literature review and the case study analysis, this paper outlines several recommendations to boost citizen participation for building smarter cities in the two regions. ASEAN and the EU can support local developments by enhancing cooperation and supporting the exchange of best practices within and between the two regions with respect to creating opportunities for citizen participation in local decision-making and urban development.

1. INTRODUCTION

Cities are home to over half of the global population and still growing. By 2050 it is expected that over two thirds of the global population will live in cities.¹ Cities also bring massive contributions to the global economic output, with an estimated 80 per cent of the global gross domestic product (GDP) being generated in cities.² At the same time, however, urban living is faced with growing challenges. Trends in demographic change (such as urban population growth and aging) bring to the forefront the need for innovative solutions to meet the needs of urban dwellers. Making cities more energy efficient is becoming a key priority in the context of climate change. Moreover, the Sustainable Development Solutions Network (SDSN) estimated that over 65 per cent of the Sustainable Development Goals (SDGs) can only be achieved with the sustained engagement of local and regional administrations.³

In this context of opportunities and challenges, the concept of smart city has risen in popularity. The concept of “smart city”, conveying at its core the use of digitalisation and new technologies to address policy issues and improve the competitiveness of cities, has become an approach for shaping cities to better address the needs of citizens and evolving challenges across three major areas: economic, social, and environmental.⁴ From the economic perspective, the deployment of new technologies for smart cities is expected to enhance the competitiveness of cities and drive growth. From a social perspective, smart cities put an emphasis on citizen wellbeing,

1. United Nations, Department of Economic and Social Affairs, Population Division. 2019. World Urbanization Prospects 2018: Highlights. Available at: (<https://population.un.org/wup/Publications/Files/WUP2018-Highlights.pdf>).

2. World Bank. 2020. Urban development: overview. Last accessed 12 November 2021. Available at: (<https://www.worldbank.org/en/topic/urbandevelopment/overview#1>).

3. UN Sustainable Development Solution Network. 2016. Getting Started with the SDGs in Cities. A Guide for Stakeholders. Last accessed 12 November 2021. Available at: (<http://unsdsn.org/wp-content/uploads/2016/07/9.1.8.-Cities-SDG-Guide.pdf>).

4. OECD. 2020. Smart Cities and Inclusive Growth: Building on the Outcomes of the 1st OECD Roundtable on Smart Cities and Inclusive Growth. Last accessed 12 November 2021. Available at: (https://www.oecd.org/cfe/cities/OECD_Policy_Paper_Smart_Cities_and_Inclusive_Growth.pdf).

improving the design and delivery of public services and better responding to the fundamental needs of citizens. Finally, and especially important in the context of sustainable development, the environmental dimension brings to the fore the need to reduce the impact of cities on the environment and improve energy efficiency, especially in the context in which it is estimated that cities emit over 70 per cent of the total greenhouse emissions.⁵

Most recently, the COVID-19 pandemic has revealed some of the weaknesses of cities. The high level of interconnected activities and population density that unleash opportunities and drive growth also make cities vulnerable in the face of global crises such as a pandemic. Shaping the cities of tomorrow to better respond to future challenges is paramount.⁶ In the process of making cities smarter and more sustainable, stakeholder cooperation is essential and citizens are at the centre. They are both the ultimate beneficiaries of measures to make cities smarter and more sustainable, as well as key active stakeholders to provide the necessary input for such measures and help shape the smarter cities of tomorrow. As smart cities look to innovation and digitalisation to tackle policy challenges, one key question is how digital tools can be leveraged for citizen participation in smarter cities.

Against this background, this article investigates how the role of citizens in building smart cities is considered in the policy process. The article focuses on two regions – namely the Association of Southeast Asian Nations (ASEAN) and the European Union (EU) – and their approach to citizen participation for smart cities. In addition, the article analyses two concrete measures aimed at facilitating citizen participation for local policymaking, putting the emphasis on the need for identifying and exchanging best practices between cities. The choice of regions is rooted in the evolving and strengthening partnership between ASEAN and the EU, as well as in the prominence of the smart city concept in the policy strategies of the two regions. The paper relies on an extensive review of the literature on smart cities and citizen participation, an overview of the key policy developments related to smart cities and citizen participation in ASEAN and the EU over the last decade, and on two case

5. Ibid.

6. Sharifi, A., and Khavarian-Garmsir, A. R. 2020. The COVID-19 pandemic: Impacts on cities and major lessons for urban planning, design, and management. *The Science of the total environment*, 749, 142391. (<https://doi.org/10.1016/j.scitotenv.2020.142391>).

studies of innovative methods for citizen participation in cities in ASEAN and the EU, namely Singapore and Madrid. The case studies are based on publicly available information of the two initiatives, as discussed in more detail in section 4 of this article.

The paper is structured as follows. The article first presents the state of the art in the literature on smart cities and outlines the role of citizen participation in policymaking for smart cities. Then it discusses the policy context around smart cities in ASEAN and the EU and the extent to which citizen participation is emphasised in the two regions. Based on a review of the different forms of citizen participation, the article then discusses selected case studies of innovative methods to facilitate citizen participation for smarter cities in ASEAN and the EU. The article then concludes with recommendations for designing innovative, digitally driven approaches to citizen participation for smart cities.

2. LITERATURE REVIEW: LEVERAGING CITIZEN PARTICIPATION IN THE POLICYMAKING PROCESS

Citizens as Key Stakeholders in Smart Cities

Various definitions of smart cities have been proposed.⁷ A comprehensive definition has been put forward by the United Nations Economic Commission for Europe (UNECE) and International Telecommunication Union (ITU), developed based on input from over 300 experts. The UNECE and ITU thus define the smart, sustainable city as “an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations

7. Ramaprasad A., Sánchez-Ortiz A., and Syn T. 2017. A Unified Definition of a Smart City. In: Janssen M. et al. (eds.) *Electronic Government. EGOV 2017. Lecture Notes in Computer Science*, 10428. Springer, Cham. Last accessed 12 November 2021. (https://doi.org/10.1007/978-3-319-64677-0_2).

with respect to economic, social, environmental as well as cultural aspects.”⁸ Furthermore, the Organisation for Economic Co-operation and Development (OECD) emphasises the importance of collaboration and stakeholder engagement in the implementation of smart cities initiatives.⁹ The need to effectively engage stakeholders underlines the cross-cutting nature of the issues with which cities are faced and the need to devise comprehensive solutions involving the public and private sectors as well as civil society.

As complex systems, smart cities include several core components. Three main components are evoked in the literature (Pardo and Nam 2011¹⁰, Meijer and Bolivar 2015¹¹): technology (i.e., infrastructure and enabling technologies), institutional factors (namely, governance, interaction between stakeholders, and policy framework), and human factors (education and skills). Attempts to operationalise the concept of smart cities further define six characteristics and factors of smart cities, pointing to the key outcomes that are expected from the implementation of smart city initiatives: smart economy, smart people, smart governance, smart mobility, smart environment, smart living.¹² Smart city initiatives rely on stakeholders, including citizens, to collaborate and contribute to the development and implementation of initiatives to improve the design and functioning of cities. Indeed, the

8. United Nations, Economic and Social Council. 2015. The UNECE-ITU Smart Sustainable Cities Indicators. (https://unece.org/fileadmin/DAM/hlm/projects/SMART_CITIES/ECE_HBP_2015_4.pdf). Last accessed 12 November 2021; ITU-T Recommendation Y.4900.

9. OECD. 2019. Enhancing The Contribution of Digitalisation to The Smart Cities of The Future. Last accessed 12 November 2021. Available at: (<https://www.oecd.org/cfe/regionaldevelopment/Smart-Cities-FINAL.pdf>).

10. Nam, T., and Pardo, T. A. 2011. Conceptualizing smart city with dimensions of technology, people, and institutions. dg.o '11: Proceedings of the 12th Annual International Digital Government Research Conference: Digital Government Innovation in Challenging Times, June 2011, pp. 282–291. (<https://doi.org/10.1145/2037556.2037602>).

11. Meijer, A., and Bolívar, M. P. R. 2015. Governing the smart city: a review of the literature on smart urban governance. *International Review of Administrative Sciences*, 82(2), 392–408. (<https://doi.org/10.1177/0020852314564308>).

12. Giffinger, R., Fertner, C., Kramar, H., Kalasek, R., Pichler-Milanovic, N., and Meijers, E. 2007. Smart Cities - Ranking of European medium-sized cities. Vienna University of Technology. Available at: (https://curis.ku.dk/ws/files/37640170/smart_cities_final_report.pdf).

need for citizen participation to support smart city initiatives is increasingly emphasised in the literature.^{13, 14, 15}

Approaches to Citizen Participation: From Transparency to Co-Creation

Citizens can be engaged in the design and implementation of smart city initiatives at different levels of the process (from passive engagement, for instance, in the form of information provision from public administrations, to active involvement based on co-creation) as well as through different tools (from petitions to participatory budgets). Increasingly, co-creating policies with stakeholders and citizens in particular is seen as a necessary step to drive innovation and effectively respond to citizens' needs.¹⁶

An extensive study of 173 cities in Europe¹⁷ identifies four levels of citizen participation in shaping policies at the local level, going from the passive level (information) to increasingly active levels of participation and co-creation (consultation, co-design and co-decision).¹⁸ In addition, the tools that

13. Bull, R. and Azennoud, M. 2016. Smart citizens for smart cities: participating in the future. *Proceedings of the Institution of Civil Engineers - Energy*, 169 (3), pp. 93-101. (<https://doi.org/10.1680/jener.15.00030>).

14. Bouzguenda, I., Alalouch, C., and Fava, N. 2019. Towards smart sustainable cities: A review of the role digital citizen participation could play in advancing social sustainability. *Sustainable Cities and Society*, Vol. 50. (<https://doi.org/10.1016/j.scs.2019.101627>).

15. Oliveira, Á., and Campolargo, M. 2015. From Smart Cities to Human Smart Cities. 2015 48th Hawaii International Conference on System Sciences, pp. 2336-2344. (doi: 10.1109/HICSS.2015.281).

16. Voorberg, W. H., Bekkers, V. J. J. M., and Tummers, L. G. 2015. A systematic review of co-creation and co-production: Embarking on the social innovation journey. *Public Management Review*, volume 17, issue 9, pp. 1333-1357. (<http://dspace.library.uu.nl/handle/1874/334352>).

17. EURO CITIES. 2021. City administrations paving the way to participatory democracy. Last accessed 12 November 2021. Available at: (https://eurocities.eu/wp-content/uploads/2021/10/Cities-and-participation_Eurocities_Brief.pdf).

18. Similar classifications of the different levels of citizen engagement, going from passive to active engagement, are discussed in the literature. For instance: Hasler, S., Chenal, J., and Soutter, M. 2017. Digital tools and citizen participation: Towards sustainable and responsive urban planning. UPPD 2017 Conference Proceedings. (doi: 10.5176/2425-0112_UPPD17.18).

can be used to facilitate and stimulate citizen participation range from more traditional tools such as petitions to more innovative tools such as participatory budgets and social labs.

In the context of smart cities, which are crucially underpinned by the promise of digitalisation and new technologies, there is an increasing focus on the use of digital tools to foster more citizen participation and engagement. Digitally enabled citizen participation is expected to actively contribute to the development of not only smart but also human-centric cities.¹⁹ Digital tools can be used to enhance both passive and active forms of citizen engagement. When it comes to passive engagement of citizens, the potential of digital tools and technologies lies primarily in the management of big data and the visualisation and communication of information derived from the processing of big data.²⁰ Big data provides the basis for city authorities to take more evidence-based decisions. At the same time, digital technologies can also help distil information from big data and improve citizens' access to information about developments in different sectors of their city. In terms of the active engagement of citizens, digital tools in the form of web tools and mobile apps can enable the citizens' participation at different stages of the policymaking process. Such tools can provide a channel for citizens to raise issues, participate in online surveys, and provide feedback to authorities. Crowdsourcing and co-design digital tools can enable greater participation through collection of ideas and the design and implementation of new policies. Finally, e-platforms can be used as a comprehensive approach to citizen participation, combining multiple tools and opportunities for participation.²¹

While promising, digital technologies have, nevertheless, limitations. In deploying such tools, stakeholders (whether policymakers, civil society, or academia in particular) must consider possible impacts on inclusion deriving from digital divides and limited access to the internet. This may be a larger issue in ASEAN compared to the EU. The internet penetration rate in ASEAN

19. Bouzguenda, I., Alalouch, C., and Fava, N. 2019. Towards smart sustainable cities: A review of the role digital citizen participation could play in advancing social sustainability. *Sustainable Cities and Society*, 50, [101627]. (<https://doi.org/10.1016/j.scs.2019.101627>).

20. Stratigea, A., Papadopoulou, C. A., and Panagiotopoulou, M. 2015. Tools and Technologies for Planning the Development of Smart Cities. *Journal of Urban Technology*, 22:2, 43-62. (doi: 10.1080/10630732.2015.1018725).

21. Ibid.

stands at approximately 58 per cent²² whereas in the EU the rate stands at 90 per cent²³; beyond the average rates, disparities within the countries of the two regions also exist. It is not only the overall access to the internet that is relevant, but also the devices that are predominantly used. In this respect, ASEAN has a high rate of mobile connectivity (141 per cent²⁴ compared to approximately 121 per cent in the EU²⁵), which indicates that for broader participation, digital solutions that are adapted to mobile users would be relevant for the effective deployment of digital participation solutions.

3. POLICY CONTEXT: ASEAN AND EU POLICY PERSPECTIVES ON SMART CITIES AND CITIZEN PARTICIPATION

In the context of current policy trends and challenges in urban areas, smart cities hold strategic positions in the policy agendas in ASEAN and in the EU. While not a silver bullet, smart cities have nevertheless the potential to tackle some of the key issues urban areas are facing such as demographic trends, climate change, the need to manage resources efficiently, and the need to contribute to the overarching goal of improving living outcomes for citizens.

22. Centre for Liveable Cities Singapore. 2018. ASEAN Smart Cities Network. Available at: (<https://www.clc.gov.sg/docs/default-source/books/book-asean-smart-cities-network.pdf>).

23. Eurostat. 2020. Digital economy and society statistics - households and individuals, Internet access of households 2014 and 2019. Available at: (https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Digital_economy_and_society_statistics_-_households_and_individuals).

24. Centre for Liveable Cities Singapore. 2018. ASEAN Smart Cities Network. (<https://www.clc.gov.sg/docs/default-source/books/book-asean-smart-cities-network.pdf>).

25. World Bank. 2021. Mobile cellular subscriptions (per 100 people) - European Union 2020, International Telecommunication Union (ITU) World Telecommunication/ICT Indicators Database. Available at: (<https://data.worldbank.org/indicator/IT.CEL.SETS.P2?locations=EU>).

Strengthening Cooperation for Smart ASEAN Cities

The strategic role of smart cities in ASEAN is embodied by the ASEAN Smart Cities Network (ASCN).²⁶ An initiative led by Singapore, an often-cited example of a smart city,²⁷ the network aims to foster cooperation in the region, facilitate the exchange of best practices, promote partnerships between stakeholders as well as secure support from partners beyond ASEAN. At the level of concrete implementation, the ASCN will monitor the progress of smart city initiatives in 26 pilot cities in ASEAN.²⁸ The work of the ASCN is aligned with a key initiative of the Master Plan on ASEAN Connectivity 2025 promoting sustainable urbanisation.²⁹ Such initiatives come in the wider context of massive urbanisation in the region, with the proportion of the urban population in ASEAN expected to increase to 65 per cent in 2050 (compared to 47 per cent in 2014) and five ASEAN nations expected to become countries with a majority urban population.³⁰ Furthermore, the environmental sustainability aspect of urbanisation is particularly emphasised through related actions, such as the ASEAN Cooperation on Environmentally Sustainable Cities, established already in 2005.³¹

The ASCN endorsed in 2018 the ASEAN Smart Cities Framework, a comprehensive document providing the basis for the ASCN activities and, importantly, emphasising key objectives and areas of focus for the development

26. The ASCN was established in 2018. See: (<https://asean.org/chairmans-statement-of-the-32nd-asean-summit/>).

27. See for instance the smart city index developed by the International Institute for Management Development (IMD): IMD. 2021. Smart City Index 2021. Last accessed 12 November 2021. Available at: (https://www.imd.org/smart-city-observatory/home/#_smartCity).

28. ASEAN. 2019. ASCN2019 - ASEAN Smart Cities Network: Advancing Partnership for Sustainability. Last accessed 12 November 2021. Available at: (<https://asean.org/wp-content/uploads/2021/08/ASCN2019-Report.pdf>).

29. ASEAN. 2016. Master Plan on ASEAN Connectivity 2025. Last accessed 12 November 2021. Available at: (https://asean.org/wp-content/uploads/2021/08/8_compressed.pdf).

30. UN Environment. 2018. Sustainable Urban Infrastructure Transitions in the ASEAN Region: A Resource Perspective. United Nations Environment Programme. Last accessed 12 November 2021. Available at: (<https://wedocs.unep.org/handle/20.500.11822/31582>).

31. ASEAN Cooperation on Environmentally Sustainable City. Last accessed 12 November 2021. (<https://environment.asean.org/awgesc/>).

of smart cities in ASEAN. The Framework emphasises three interdependent objectives relating to the economic, social and environmental aspects of smart cities, namely, competitive economy, sustainable environment, and high quality of life, as well as six developmental focus areas, namely, civic and social, health and well-being, safety and security, quality environment, infrastructure, and industry and innovation.³² From the point of view of stakeholder engagement, the ASCN puts an emphasis on collaboration and partnerships to engage the public and private sectors, civil society, multilateral financial organisations and international organisations in the shaping of smart cities. The importance of citizen centricity in designing smart cities is recognised, especially through specific initiatives, such as the Smart City Thailand initiative³³.

Tapping the Opportunities of the Digital Transformation for Smart Cities in the EU

In the EU, smart city initiatives are closely intertwined with digital transition strategies, research, and innovation, as well as regional policies. The stronger economic and political cooperation and coordination in the EU translates into a mix of tools that can be deployed in support of smart city initiatives, including strategic projects devised at the EU level but also EU funds.

Several recent initiatives are relevant. The European Innovation Partnership on Smart Cities and Communities (EIP SCC)³⁴, established in 2012, put stakeholder engagement at the centre, bringing together cities, industry, civil society, and other smart city actors in the EU to develop smart city solutions in three areas: ICT, energy, and transport. The Partnership evolved into the Smart Cities Marketplace, building also on a series of other EU-supported

32. ASEAN Smart Cities Framework, Endorsed by ASCN on 8 July 2018. Last accessed 12 November 2021. Available at: (<https://asean.org/wp-content/uploads/2021/09/ASEAN-Smart-Cities-Framework.pdf>).

33. ASEAN. 2019. ASCN2019 - ASEAN Smart Cities Network: Advancing Partnership for Sustainability, p. 63. Last accessed 12 November 2021. Available at: (<https://asean.org/wp-content/uploads/2021/08/ASCN2019-Report.pdf>).

34. European Commission. 2012. Communication on Smart Cities and Communities - European Innovation Partnership, C(2012)4701. Available at: ([https://ec.europa.eu/transparency/documents-register/detail?ref=C\(2012\)4701&lang=en](https://ec.europa.eu/transparency/documents-register/detail?ref=C(2012)4701&lang=en)).

projects for smart cities (the EU Smart Cities Information System³⁵). The Marketplace is a multi-purpose platform facilitating stakeholder collaboration through events, community building, and, importantly, providing a space of bankable smart city projects to be paired with investors. The Marketplace includes six action clusters that support the identification of problems and the sharing of best practices on particular issues.³⁶ One of the action clusters (“Citizen Focus”) acknowledges the role of not only facilitating citizen participation but encouraging co-creation across the different smart city areas as well as planning and implementation.³⁷ The Urban Agenda for the EU, set up in 2016³⁸, also supports collaboration among stakeholders to develop solutions for smart cities. With several partnerships set up on a variety of topics including circular economy, digital transition, and housing among others, the Urban Agenda puts the emphasis on both smart and sustainable growth.³⁹ As the monitoring of progress is crucial, one of the actions of the digital transition partnership relates to the development of a Digital Economy and Society Index (DESI) at local level.⁴⁰

Finally, there are also noteworthy steps coming directly from cities and calling for close cooperation: the “Living-in.EU” movement and the “Declaration on Citizens’ engagement”. Public authorities at the local, regional, national and the EU levels committed to, among others, strengthening investment, facilitating the development of digital solutions for cities, and in-

35. (<https://www.ceps.eu/ceps-projects/eu-smart-cities-information-system-scis/>).

36. European Commission, Smart Cities Marketplace: Action Clusters. Last accessed 12 November 2021. (<https://smart-cities-marketplace.ec.europa.eu/action-clusters-and-initiatives/action-clusters>).

37. European Commission, Smart Cities Marketplace: Action Clusters, Citizen focus. Last accessed 12 November 2021. (<https://smart-cities-marketplace.ec.europa.eu/action-clusters-and-initiatives/action-clusters/citizen-focus>).

38. Urban Agenda for the EU: ‘Pact of Amsterdam’, Agreed at the Informal Meeting of EU Ministers Responsible for Urban Matters on 30 May 2016 in Amsterdam, The Netherlands. Last accessed 12 November 2021. (https://ec.europa.eu/futurium/en/system/files/ged/pact-of-amsterdam_en.pdf).

39. European Commission. The Urban Agenda for the EU. Last accessed 12 November 2021. (https://ec.europa.eu/regional_policy/en/policy/themes/urban-development/agenda/).

40. See Action 5 of the Partnership Action Plan: (<https://futurium.ec.europa.eu/en/urban-agenda/digital-transition/action-plan/digital-transition-action-plan>). Last accessed 12 November 2021.

creasing the focus on citizen centricity in policy design in the “Declaration on joining forces to boost sustainable digital transformation in cities and communities in the EU”⁴¹ as part of the “Living-in.EU” movement. This step comes to complement the EU’s approach to boosting smart cities and tapping the potential of the digital transformation. In addition, almost 80 European cities adopted the “Declaration on Citizens’ Engagement” putting forward a clear call for involving citizens in the design and implementation of smart cities.⁴²

EU-ASEAN Cooperation on Smart Cities

Both ASEAN and the EU place great emphasis on the role of cooperation and the exchange of best practices to achieve smart city goals. The strategic partnership between the two regions delivers specific actions in this sense. The EU committed to contribute €5.1 million to the Smart Green ASEAN Cities Programme between 2021 and 2025.⁴³ The programme aims to contribute to the ongoing initiatives in the region (the ASCN, the ASEAN Sustainable Urbanisation Strategy, as well as the ASEAN Initiative on Environmentally Sustainable Cities) with a focus on reducing the environmental impact of urban areas.

4. METHODOLOGY

Building on the key aspects of citizen participation in the digital age and the relevance of smart city policies in ASEAN and the EU, two case studies of citizen participation at the city level are discussed: the redesigning of Singapore’s Tanjong Pagar neighbourhood and Madrid’s platform for digital citizen

41. See: Declaration on joining forces to boost sustainable digital transformation in cities and communities in the EU. Last accessed 12 November 2021. (<https://living-in.eu/declaration>).

42. EURO CITIES. There is no Europe without citizens. Last accessed 12 November 2021. (<https://citizens.eurocities.eu/>).

43. European External Action Service. Factsheets: Smart Green ASEAN Cities Programme. Last accessed 12 November 2021. (https://eeas.europa.eu/sites/default/files/factsheet_sgac.pdf).

participation, Decide Madrid. Smart cities draw on the opportunities brought by ICT and innovation; the two case studies underline how, in the context of smart cities, digital tools can be deployed to engage citizens in shaping local policies. The case studies explore the background and objectives of the two initiatives for citizen participation, as well as the approach used, analysing them based on the following criteria:

- Effectiveness, detailing the extent to which the initiative has reached its objectives;
- Accessibility and inclusion, referring to the way in which the tools are made available to citizens and the extent to which issues such as digital divide are considered; and
- Reusability, capturing the extent to which the tools can be applied in different cases and by different cities.

These criteria would shed light on key experiences from the interventions, as well as outline how they may be reused and reapplied in the future to stimulate citizen participation.

The main limitation of the analysis resides in its exploratory approach and on the reliance on information and data available online, from the project implementers for the Singapore case study and the platform information and data for the Madrid case study. Similar analyses could be enriched in the future with more data from the user level to assess in more detail the user experience and the perceived impact of such initiatives among the citizens as ultimate users. This exploratory exercise aims to ultimately contribute to collecting best practices on citizen participation in the context of smart city policies and to deriving recommendations that could inform similar future initiatives.

5. CASE STUDIES ON CITIZEN PARTICIPATION FOR SMART CITIES

Redesigning Neighbourhoods: The Case of “Ideas for Tanjong Pagar”

Background and objectives

Research experiments play a key role in showcasing how new tools can be used to facilitate citizen participation. At the same time, they show that researchers can play a crucial role as initiators of citizen participation projects and partners for policymakers. These key aspects are reflected in the case of crowdsourcing ideas and feedback from citizens for the redesign of the Tanjong Pagar district in Singapore.

“Ideas for Tanjong Pagar” was a project implemented in 2018 by the research centre Future Cities Laboratory (FCL) of the Singapore-ETH Centre in cooperation with the non-governmental organisation (NGO) for community engagement Participate in Design.⁴⁴ The project aimed to showcase an innovative tool for citizen participation in urban planning. While the project was not initiated by policymakers, but by researchers, it was launched in the context in which the Urban Planning Authority of Singapore announced plans for the urban development of the “Greater Southern Waterfront”, an area covering among others the Tanjong Pagar district.⁴⁵ The redevelopment of Tanjong Pagar is planned to begin after 2027.⁴⁶ In this context, the objectives of the “Ideas for Tanjong Pagar” project were twofold: to test a new tool for citizen engagement and to contribute, through the new tool, to ongoing policy developments.

44. The website of the project is only available in an archived version, available at: (<http://web.archive.org/web/20210513142804/https://ideasfortanjongpagar.com/about-the-study/>). Last consulted 7 December 2021.

45. Urban Planning Authority Singapore. 2021. Urban Transformations, Greater Southern Waterfront: Gateway to Future Live, Work & Play. Last consulted: 7 December 2021. Available at: (<https://www.ura.gov.sg/Corporate/Planning/Master-Plan/Urban-Transformations/Greater-Southern-Waterfront>).

46. URA. 2020. Speech by Mr Lawrence Wong, Minister for National Development and Second Minister for Finance, at the Launch of Exhibition of Public Ideas for Pasir Panjang Power District. Available at: (<https://www.ura.gov.sg/Corporate/Media-Room/Speeches/speech20-03>).

Approach

The approach adopted in the project consisted of an interactive map-based design tool. The wider public was invited to participate in the design exercise and share their ideas in an intuitive way, by drawing on the map their vision of urban development for Tanjong Pagar. The design exercise was accompanied by survey questions to understand the rationale behind the design choices made by respondents. One of the software solutions used to gather input from the public was Maptionnaire,⁴⁷ a community engagement platform specialised in map-based tools for citizen participation and data collection.⁴⁸ An additional software solution, based on an interactive map, was also developed by FCL.⁴⁹

Analysis

From the point of view of **effectiveness**, it is important to understand how the project achieved its objectives of testing a new tool and contributing to policy discussions. The project reached overall positive results by testing the map-based tool to stimulate the public to provide ideas in an intuitive way. The experience during the project showed that the approach was overall positively received by the public.⁵⁰ In particular, the Maptionnaire tool appeared to be effective in engaging people to contribute ideas.⁵¹ Depending on the interface of the tool and the specific tasks the public is asked to com-

47. Maptionnaire, available online at: (<https://maptionnaire.com/>). Last accessed 7 December 2021.

48. The web app developed for this project using Maptionnaire is available at: (<https://app.maptionnaire.com/en/3131/>). Last accessed 7 December 2021.

49. Müller, J. n.a. Quick Urban Analysis Kit. Last accessed 7 December 2021. Available at: (<https://johannesmueller.org/slideshow/quakit.html>).

50. Müller, J., Asada, S., and Tomarchio, L. 2020. Engaging the Crowd: Lessons for Outreach and Tool Design from a Creative Online Participatory Study. *International Journal of E-Planning Research (IJEPR)*, 9(2), 66-79, p. 75. (<https://doi.org/10.3929/ethz-b-000400521>).

51. Maptionnaire. 2018. Singapore-ETH Future Cities Laboratory Designs New Waterfront Neighborhood with Citizens. Last accessed 7 December 2021. Available at: (<https://maptionnaire.com/best-participation-practices/people-centric-participation-tool>).

plete, additional support (for instance by organising in-person events to accompany the online process) for respondents may enhance effectiveness.⁵²

The objective of providing input for the future urban development plans for Tanjung Pagar were only partially reached. On the one hand, the approach is promising in terms of stimulating citizen participation, as shown by the overall positive feedback from the users of the tool. On the other hand, the overall participation rate remained limited. Several factors may have affected participation. First, the project was run by a research institute and an NGO, without a direct link to policymakers. This may have had an impact on how citizens perceived the usefulness of participating in the project. Second, the redevelopment of the Tanjung Pagar district is planned to begin after 2027. Hence, the distance in time between the implementation of the project and the expected implementation of redevelopment plans is relatively long and might have influenced the desire of citizens to engage early in the process.

In terms of **accessibility and inclusion**, the project emphasised the need for user-friendliness in the development of the tool. In particular, feedback collected from respondents also helped improve the approach taken in the development and implementation of the map-based tool of the FCL⁵³, by focusing on providing more concise information and an intuitive interface that anticipates the needs of respondents. A concrete example of the need for increased accessibility emerged during the project. The tool was promoted through different channels, including on social media, a channel that is often accessed via mobile devices. As the tool was not optimised for mobile devices, accessibility was an issue from this point of view.⁵⁴ In addition to the tool developed by FCL, the Maptionnaire tool was found to have

52. Müller, J., Asada, S., and Tomarchio, L. 2020. Engaging the Crowd: Lessons for Outreach and Tool Design from a Creative Online Participatory Study. *International Journal of E-Planning Research (IJEPR)*, 9(2), 66-79, p. 75. (<https://doi.org/10.3929/ethz-b-000400521>).

53. Ibid.

54. Ibid., p. 71.

an intuitive interface, with features that were familiar to respondents and thus easy to use.⁵⁵

Finally, while user-friendliness is essential, inclusion needs to be considered in the context of the digital divide. Indeed, the project also highlighted that in-person events and assistance may be useful to generate greater participation.⁵⁶

In terms of **reusability and scalability**, the approach can be deployed in other situations to support citizen-centric urban development. For instance, the tool developed by FCL was applied to develop an exercise in collaboration with the Singapore Urban Authority, with the aim to gather input from citizens for the remodelling of a former air base.⁵⁷ The Maptionnaire tool already includes several reuse examples in cities including Stockholm, Denver, and Edinburgh, among others.⁵⁸ The tools, however, are not open source. The level of reusability thus depends on the extent to which the FCL-developed tool is maintained by the research centre and made available more widely. In the case of Maptionnaire, using the tool implies relying on the services offered by the platform.

Proposing, Debating, Voting as E-Participation: The Case of “Decide Madrid”

Background and objectives

Launched in September 2015, “Decide Madrid” is an e-participation platform allowing citizens to become involved at different levels of the decision-making

55. Maptionnaire. 2018. Singapore-ETH Future Cities Laboratory Designs New Waterfront Neighborhood with Citizens. Last accessed 7 December 2021. Available at: (<https://maptionnaire.com/best-participation-practices/people-centric-participation-tool>).

56. Müller, J., Asada, S., and Tomarchio, L. 2020. Engaging the Crowd: Lessons for Outreach and Tool Design from a Creative Online Participatory Study. *International Journal of E-Planning Research (IJEPR)*, 9(2), 66-79, p. 75. (<https://doi.org/10.3929/ethz-b-000400521>).

57. Müller, J. n.a. Quick Urban Analysis Kit. Last accessed 7 December 2021. Available at: (<https://johannesmueller.org/slideshow/quakit.html>).

58. Maptionnaire. Where Maptionnaire works. Last accessed 7 December 2021. Available at: (<https://maptionnaire.com/#use-cases>).

ing process at the local level. The objective of the initiative, as described on the platform, is to encourage citizen participation and particularly “the generation of new and viable ideas and proposals for improving their quality of life”, thus contributing to “better decisions taken for the general interests”.⁵⁹

The platform was launched by the City Council of Madrid and it relies on the open source e-participation web software “Consul”. Originally developed for Madrid, the software is now used around the world by 135 institutions in 35 countries.⁶⁰ The City Council of Madrid also offers assistance to other institutions who are interested in reusing the software.⁶¹

Approach

Decide Madrid is a comprehensive platform that offers several tools for citizen participation: citizens can make proposals, vote on proposals (proposals made by citizens who receive enough support) or on issues on which the municipality wants the opinion of citizens, decide on how to allocate specific shares of the budget (participatory budget), participate in the development or modification of local regulations, and engage in discussions and debates.⁶² For the participatory budget procedure for 2021, €35 million of the budget is available for projects proposed at the district level and an additional €15 million is available for projects proposed at the municipal level or that cover multiple districts.⁶³ Overall, the sum represents approximately 0.9 per cent of the 2021 municipal budget, marking a decrease compared to previous years (for instance, in 2019, the share of the municipal budget reserved for the participatory budget process was approximately 1.7 per cent⁶⁴).

59. Decide Madrid. Condiciones de uso. Last accessed 7 December 2021. Available at: (<https://decide.madrid.es/condiciones-de-uso>).

60. According to the statistics recorded on the website dedicated to the Consul project on 7 December 2021. See: (<https://consulproject.org/en/#features>).

61. Decide Madrid. Utilízalo en tu municipio. Last accessed 7 December 2021. Available at: (<https://decide.madrid.es/mas-informacion/como-usar>).

62. Decide Madrid. Ayuda. Last accessed 7 December 2021. (<https://decide.madrid.es/mas-informacion>).

63. Decide Madrid. Presupuestos Participativos 2021. Available at: (<https://decide.madrid.es/presupuestos>). Last accessed 7 December 2021.

64. City of Madrid Open Budgets. Revenue and Expenditure at City of Madrid 2019. Last accessed 7 December 2021. Available at: (<https://presupuestosabiertos.madrid.es/en/resumen#year=2019>).

The platform can be used by different stakeholder groups, but access to certain features is restricted to the extent to which users verify their identity and prove their status as residents of Madrid. For instance, to vote on proposals, users need to be residents of the city and over 16 years old.⁶⁵

Analysis

In terms of the **effectiveness** of the approach, several key performance indicators can provide insights into how Decide Madrid has been reaching its objectives. For instance, over 26,000 proposals have been submitted since the launching of the platform. However, only two proposals received enough support from other citizens in order to be eligible to be submitted to a vote. Together with other issues submitted to a vote by the City Council, in total 35 voting procedures have been launched using the platform. Further figures are described in Table 1.

A study published in 2020 showed that while the number of registered proposals as well as the number of projects for the participatory budget decreased until 2018, participation increased in different areas.⁶⁶ For instance, the number of citizens taking part in the participatory budget process increased from 45,529 in 2016 to 91,032 in 2018 and this trend was also reflected in an increase in the votes cast on the projects to be selected for the participatory budgets (from 32,725 votes in 2016 to 53,891 votes in 2018 in the final phase). However, a slight decrease was registered in 2019 (see Table 1). This suggests a relatively higher attractiveness of the participatory budget feature which may be due to the clearer link between how citizen participation translates into concrete measures taken by the local administration. Information is also available on the platform concerning the evolution of approved projects. Nevertheless, a study suggests that more information and follow-up about the progress of projects and the link to the contributions of citizens would be useful to increase the effectiveness of the platform.⁶⁷

65. (<https://decide.madrid.es/vota>). Last accessed 7 December 2021.

66. Royo, S., Pina, V. and Garcia-Rayado, J. 2020. Decide Madrid: A Critical Analysis of an Award-Winning e-Participation Initiative. *Sustainability* 12, no. 4: 1674. (<https://doi.org/10.3390/su12041674>).

67. Pina, V., Torres, L., Royo, S., and García-Rayado, J. 2019. Decide Madrid: A Case Study on E-Participation. *Tropico project*. Last accessed 7 December 2021. Available at: (<https://tropico-project.eu/cases/administration-costs-for-bureaucracy/decide-madrid-a-case-study-on-e-participation/>).

Table 1. Summary of key performance indicators for the tools deployed on the Decide Madrid e-participation platform.

| Tool | Key performance indicator | Value |
|--|---|--------|
| Proposals | Total number of proposals submitted | 26,601 |
| | Proposals that received enough support to be submitted to vote | 2 |
| Voting | Number of issues submitted to vote at the municipal level | 13 |
| | Number of issues submitted to vote at the district level | 22 |
| Participatory budget (2019)* | Number of projects proposed | 4,426 |
| | Number of projects selected in the final phase | 693 |
| | Number of projects selected for implementation | 41 |
| | Number of citizens who participated in the process | 75,608 |
| | Number of votes cast in the final phase | 44,149 |
| Development or modification of local regulations | Number of regulatory issues on which input from citizens was sought | 117 |
| Debates and discussions | Number of items open for debates and discussions | 3,776 |

Note: The values collected for the performance indicators capture the activity on the Decide Madrid platform from when it was initiated in 2015 up to 9 December 2021.

Note: The key performance indicators and values for the participatory budget related to the 2019 exercise. The total budget available for the year for this exercise was €100 million (€30 million for city-wide projects and €70 million for district-level projects).*

Source: Data retrieved from the Decide Madrid platform on 9 December 2021.

While Decide Madrid proposes a comprehensive digital approach to enhancing citizen participation, it is also important to note that steps were taken to ensure **accessibility and inclusion** to participatory processes offline. Key participation options available on the platform (making proposals, voting, getting involved in the participatory budget process) are also available offline, in-person, by visiting one of the 26 Citizen Assistance Offices ("Ofici-

nas de Atención al Ciudadano”).⁶⁸ In terms of the demographics of online participation, the distribution by age shows that multiple age groups were engaged on the platform. For instance, when it comes to the participatory budget process for 2019, the greatest level of participation was among citizens aged between 30 and 44, but it is noteworthy that older citizens are also engaged in the process.⁶⁹ Concerns about a digital divide are therefore more limited, especially when considering the possibilities for offline participation.

In terms of **reusability**, the underlying software, Consul, has been re-used by multiple cities and institutions around the world. The options of the software can be tailored depending on the specific needs of the institutions using it, by, for instance, choosing to implement only some features (out of the five used by Decide Madrid) or developing novel sections. A 2020 study⁷⁰ shows that among 51 other use cases of the Consul software, the participatory budgeting option was the most popular feature, implemented in 33 cases (65 per cent of the cases). In addition, most often only one feature of the software has been implemented.

6. CONCLUSIONS AND RECOMMENDATIONS

Digitalisation is opening novel ways for enhancing efficiency in cities but also for ensuring that citizens' feedback is considered in building smarter and more sustainable cities. In the transformative process of rendering cities smarter, more sustainable, and more resilient, engaging citizens effectively

68. Decide Madrid. Soluciones a problemas técnicos (FAQ). Last accessed 7 December 2021. Available at: (<https://decide.madrid.es/mas-informacion/faq>).

69. The shares of participants from different age groups were as follows: 7.95 per cent for 16 to 29; 39.15 per cent for 30 to 44; 36.38 per cent for 45 to 59; 13.72 per cent for 60 to 74; 2.74 per cent for over 75. Data available at: Decide Madrid. Presupuestos participativos 2019: Estadísticas. Last accessed 7 December 2021. (<https://decide.madrid.es/presupuestos/presupuestos-participativos-2019/estadisticas>).

70. Royo, S., Pina, V. and Garcia-Rayado, J. 2020. Decide Madrid: A Critical Analysis of an Award-Winning e-Participation Initiative. Sustainability 12, no. 4: 1674, p. 12. (<https://doi.org/10.3390/su12041674>).

is a key component⁷¹ of mapping issues, crowdsourcing ideas and solutions, and contributing to the effective implementation of smart city policies.

Smart city strategies have been a focal point of the policy agendas of both ASEAN and the EU, and more recently a relevant element of the ASEAN-EU strategic partnership. In creating smarter cities, the role of citizen participation has been recognised to different extents in the two regions. Nevertheless, citizen participation for smart cities can be further bolstered. ASEAN and the EU can support local developments by enhancing cooperation and supporting the exchange of best practices within and between the two regions with respect to creating opportunities for citizen participation in local decision-making and urban development. Several key lessons can be drawn from the case studies selected and based on the relevant literature.

Ensuring an inclusive approach. Digital tools usher in a new approach in engaging citizens and crowdsourcing information, feedback, and solutions. Digital tools need, nevertheless, to be paired with offline solutions to ensure wide accessibility and inclusion.

Providing intuitive means of participation. Multiple online tools can be deployed to boost citizen participation. In designing these tools, clarity, conciseness, and an intuitive approach are essential to ensure that citizens remain engaged and that they are compelled to use the same tools in the future as well. User centricity and user friendliness are thus essential for the effectiveness of the tools.

Creating feedback loops and clear connections to the decision-making process. For citizens to provide their input in participatory processes, it is necessary to explain how their feedback is expected to be used and to ensure follow-up throughout the implementation phase. Both in the case of Tanjong Pagar urban development and Decide Madrid, clarity concerning the policymaking process was emphasised as a relevant aspect. In the case of Tanjong Pagar, the relative attractiveness of the participatory project was impacted by the long distance in time between the provision of feedback and the actual expected implementation of the urban development project in the

71. Sassen, S., and Kourtit, K. A. 2021. Post-Corona Perspective for Smart Cities: 'Should I Stay or Should I Go?'. *Sustainability* 13, 9988; pp. 11-12. (<https://doi.org/10.3390/su13179988>).

district. In the case of Decide Madrid, the need for a reinforced feedback loop about the implementation of projects proposed by citizens was emphasised.

Promoting reusable solutions. The exchange of best practices and use cases can be bolstered by promoting those solutions that are more readily reusable and free of charge. The case of the open-source software “Con-sul” used by Decide Madrid is relevant in this respect, showing the extent to which a citizen participation solution can be taken up and replicated in multiple countries.

Encouraging partnerships. Finally, other stakeholder groups can play an important role in helping deploy citizen participation tools. As the case of Tanjong Pagar shows, academia can act as a strong supporter by prototyping and testing solutions.

02

Carbon Pricing as a Tool to Fulfil ASEAN's Climate Ambitions

Hien Vu | Meng Yu Ngov

Abstract

Carbon pricing is a robust mechanism that Association of South-east Asian Nations (ASEAN) member states can leverage to bolster its emission mitigation targets. This is highly relevant in the current envisaged global climate ambition and the commitments at the international level, particularly targets set in the National Determined Contributions (NDCs) under the Paris Agreement, new developments under the COP26 and recent net-zero targets of countries worldwide. Currently, several ASEAN member states have either established or prepared their carbon pricing systems in a fragmented manner. The harmonisation of carbon pricing through linking the carbon markets of ASEAN member states would result in higher levels of effectiveness and efficiency. In contrast, ASEAN member states which have not planned for carbon pricing strategies yet should rethink implementing this instrument to achieve their NDCs and support the climate targets of the ASEAN region. Finally, the design and implementation of carbon pricing must fit into a larger framework of policies in the areas of electricity markets, renewables support and sustainable finance.

1. INTRODUCTION

In recent years, decarbonisation and climate change plans have been taking centre stage in the world economy, and nations have firmly set greater ambitions in their National Determined Contributions (NDCs).¹ One of the most important landmarks is the recommitment of the United States of America to the Paris Agreement. The European Union (EU) ushered in its green policy commitment with the Green Deal Package and the proposed Carbon Border Adjustment Mechanism (CBAM) initiative. East Asia is racing towards the “Net Zero Theme”, wherein Japan and Korea are committed to achieving net zero by 2050. China is committed to carbon neutrality by 2060 and it launched its Emissions Trading System (ETS) in 2021, which is estimated to cover at least four billion tCO₂, comprising 40 per cent of the Chinese national carbon emission level.²

With the current NDC targets, there is no sign that greenhouse gas (GHG) emissions will be significantly reduced in 2030 globally. Expectedly, a rise in temperature between 2.1-3.9°C by 2100 compared to the pre-industrial level is on the horizon.³ The alarming statistics are still above the Paris Agreement target of 1.5-2°C.

Although the Association of Southeast Asian Nations (ASEAN) regional bloc joined the global consensus in promoting carbon emission reduction, ASEAN member states face a dilemma between lessening GHG emissions and, simultaneously, increasing the total energy supply to accommodate their rapid population growth and the tremendous need to expand industrialisation so as to drive their economic growth. The ASEAN Centre for Energy (ACE) forecasts an exponential growth of energy-related GHG emissions of

1. UKCOP26. 2021. COP26: The Glasgow Climate Pact. (<https://ukcop26.org/wp-content/uploads/2021/11/COP26-Presidency-Outcomes-The-Climate-Pact.pdf>).

2. World Economic Forum. 2021. How to Build a Eurasian Emission Trading System. (<https://www.weforum.org/agenda/2021/07/how-to-build-a-eurasian-emissions-trading-system/>).

3. UN Environment Programme. 2021. Emission Gap Report 2021. (<https://www.unep.org/resources/emissions-gap-report-2021>).

34-147 per cent between 2017 and 2040.⁴ The accumulation of the global emission level may be irreversible if collective action is not implemented.

This policy brief focuses on how ASEAN member states can address the negative externalities of rapid economic growth, mainly through the use of carbon pricing as a policy tool to nudge the economy towards carbon neutrality. Furthermore, it investigates the development of carbon pricing tools in ASEAN member states (Section 4). Section 5 analyses possible pathways that ASEAN member states can consider deploying in terms of effective and efficient carbon pricing tools. The policy recommendations are relevant both for member states that are already implementing/planning for carbon pricing, and those that have not yet considered carbon pricing as a priority in their policy agenda. In the final part of this paper, key takeaways are also provided for policymakers and relevant stakeholders (Section 6).

2. THE ECONOMIC AND ENVIRONMENTAL CHALLENGES FACED BY ASEAN COUNTRIES

The expansion of the ASEAN industrial base increases the region's demand for energy and possibly leads to higher dependency on conventional fossil-fuel energy sources, increasing the energy security challenges for ASEAN member states.⁵ Furthermore, the expansion of the industrial base is associated with changes in land use and loss of peatlands, while tropical storms

4. ASEAN Secretariat. 2021. ASEAN State of Climate Change Report: Current Status and Outlook of the ASEAN region: Toward the ASEAN Climate Vision 2050. (<https://asean.org/book/asean-state-of-climate-change-report/>).

5. Ahmed Khalid, Mita Bhattacharya, Zahid Shaikh, Muhammad Ramzan, and Ilhan Ozturk. 2017. Emission Intensive Growth and Trade in the Era of the Association of Southeast Asian Nations (ASEAN) Integration: An Empirical Investigation from ASEAN-8. *Journal of Cleaner Production* 154: 530–40. (<https://doi.org/10.1016/j.jclepro.2017.04.008>).

impede regional biodiversity, which Southeast Asia is highly vulnerable to.^{6,7} The Climate Risk Index (CRI), which assesses each country economically as well as the fatalities based on weather-related loss events, is a widely used indicator. The indicator identified five ASEAN member states – Myanmar, Philippines, Thailand, Vietnam, and Cambodia – among the top twenty countries highly vulnerable to climate-related disasters between 2000-2019. Even if Singapore, Brunei Darussalam, Indonesia, and Malaysia experience fewer fatalities and risks of climate-related shocks, ASEAN biodiversity, habitats and socio-economic conditions would also be significantly impacted.

The occurrence of extreme weather is likely to increase in frequency, as climate changes have intensified, and carbon emission reduction is diverging from the Paris Agreement target of 1.5-2°C. The damage caused by extreme weather may be more costly than the initial investments required to lessen the damage. As an example, the floods in 2011 caused economic damage of around 10.9 per cent of Thailand's GDP. The acceleration of climate change poses additional challenges such as worsening heat, water shortages, and a rise in sea level.⁸ These challenges are expected to impact the economy and livelihoods of citizens of ASEAN member states significantly. For example, in a hypothetical scenario of a 1-metre sea-level rise in Vietnam, an estimated 7 per cent of agricultural land will be lost. ASEAN needs to take collective action to recuperate biodiversity and mitigate the cost of damages incurred by climate change.

6. Kompas, Tom; Pham, Van Ha; and Che, Nhu. 2018. The effects of climate change on GDP by country and the global economic gains from complying with the Paris climate accord. *Earth's Future*, 6(8). (DOI: 10.1029/2018EF000922).

7. Eckstein, David; Kunzel, Vera; and Schafer, Laura. 2021. Global Climate Risk Index 2021: Who Suffers Most from Extreme Weather Events? Weather-Related Loss Events in 2019 and 2000-2019. (https://germanwatch.org/sites/default/files/Global%20Climate%20Risk%20Index%202021_1.pdf).

8. Beirne, John; Renzhi, Noubu; and Volz, Ulrich. 2021. Bracing for the Typhoon: Climate Change and Sovereign Risk in Southeast Asia. (<https://doi.org/10.1002/sd.2199>).

Table 1. Climate Risk Index (CRI) of ASEAN member states during 2000-2019.

| CRI rank | ASEAN Member States | CRI Score | Fatalities (rank) | Average fatalities per 100,000 inhabitants (rank) | Average losses in million US\$ (PPP) (rank) | Average losses per unit GDP in percent (rank) |
|----------|---------------------|-----------|-------------------|---|---|---|
| 176 | Brunei Darussalam | 167.5 | 167 | 151 | 178 | 179 |
| 14 | Cambodia | 36.7 | 38 | 35 | 53 | 28 |
| 72 | Indonesia | 74 | 14 | 91 | 18 | 115 |
| 116 | Malaysia | 105.7 | 64 | 108 | 66 | 144 |
| 2 | Myanmar | 10 | 1 | 1 | 19 | 19 |
| 4 | Philippines | 18.2 | 7 | 16 | 8 | 31 |
| 179 | Singapore | 172 | 172 | 172 | 162 | 177 |
| 9 | Thailand | 29.8 | 22 | 60 | 3 | 17 |
| 13 | Vietnam | 35.7 | 15 | 47 | 11 | 47 |

Source: Germanwatch.⁹

Note: The CRI is measured by calculating the weighted average of the individual scores. For example, Thailand ranks 9th, CRI score = $22(1/6) + 60(1/3) + 3(1/6) + 17(1/3) = 29.83$. Lower index scores indicate countries with higher climate change risk.

The COVID-19 pandemic and climate change provoked ASEAN member states and the rest of the world into rethinking their strategies in building a more resilient and sustainable economy. This requires every region to reassess and redesign its “recovery policy plan” to include green, human, and socio-economic development. The introduction of the EU’s Carbon Border Adjustment Mechanism (CBAM) is part of its vision to move towards a net-zero emissions goal. Although CBAM seemingly complies with World Trade Organisation (WTO) regulations, the implementation of CBAM may disrupt trade between the two regions. Although the pilot stage of CBAM (2023 to

9. Eckstein, David; Kunzel, Vera; and Schafer, Laura. 2021. Global Climate Risk Index 2021: Who Suffers Most from Extreme Weather Events? Weather-Related Loss Events in 2019 and 2000-2019. (https://germanwatch.org/sites/default/files/Global%20Climate%20Risk%20Index%202021_1.pdf).

2025) would not significantly impact ASEAN essential export products to the EU, ASEAN member states must proactively take preparatory measures to adapt to the implementation of the CBAM in later phases to address climate change at the national or regional levels. In this respect, the **Carbon Pricing Mechanism, in particular, Emissions Trading System (ETS)**, is considered an effective tool that can help ASEAN member states handle the negative externalities and curb carbon emission levels. The adoption of ETS would help ASEAN member states accommodate the upcoming CBAM and ultimately achieve their sustainable development targets.

Box 1. Carbon pricing tools and their merits and challenges.

Carbon pricing is a policy tool that places a value on GHG emissions stemming from economic activities.¹⁰ In their NDCs, many countries have identified carbon pricing as an efficient tool to mitigate GHG emissions and help achieve their climate targets.¹¹ Two widely used carbon pricing tools are carbon tax and ETS.

The **carbon tax** approach is effective in the elimination of short-term carbon price volatility. During an economic recession, which potentially entails a decrease in both energy use and emissions, a carbon tax system ensures that regulated entities continue to be taxed on all residual emissions. Carbon taxes are administratively simple; the tax could be based on existing methods of monitoring and reporting fuel supply to the regulatory authority. Technological changes that lower the abatement costs would decrease the aggregate emissions in the case of the carbon tax.

10. Carbon Pricing Leadership Coalition (CPLC). 2016. What is the Impact of Carbon Pricing on Competitiveness. (<https://thedocs.worldbank.org/en/doc/759561467228928508-0020022016/original/CPLCCompetitivenessprint2.pdf>).

11. UNFCCC. 2021. Nationally determined contributions under the Paris Agreement. (https://unfccc.int/sites/default/files/resource/cma2021_08E.pdf).

The **ETS** approach is more exposed to carbon price volatility in the short term.¹² ETS takes a market-based approach. It relies upon the cap-and-trade mechanism, where the objective of an ETS is to curb emissions using cost-efficient techniques.¹³ A cap-and-trade system will also involve more significant administration costs for the government and higher transaction costs for the regulated firms, but empirical evidence suggests that these costs are not significant compared to the costs under a carbon tax mechanism. Furthermore, technological change that reduces marginal abatement costs would not lower the aggregate emissions. Despite these challenges, an ETS keeps the emissions volume unchanged during economic growth (potentially leading to larger energy use and higher emissions). In the event of inflation, particularly relevant in some ASEAN member states, an ETS keeps the aggregate emissions and the real allowance prices constant (while nominal prices would increase). Besides these attributes (merits), it is also easier to link a domestic cap-and-trade regime with others than to link a domestic carbon tax system with other policy instruments in other countries.

A country's choice of the carbon pricing approach depends on different factors, including its economic, societal and environmental objectives and the capacities of the stakeholders involved in such a carbon pricing system. Each carbon pricing instrument (e.g., carbon tax, ETS) has its merits and challenges, but if properly designed and implemented, both instruments can create incentives for firms to abate emissions and achieve similar emissions reductions. Both systems may serve as an impetus to elevate a revenue stream for the government, which can be used to support innovation in decarboni-

12. In an emission trading programme, cost uncertainty – unexpectedly high or volatile allowance prices – can undermine political support for climate policies and discourage investment in new technologies and research and development. Therefore, attention has turned to incorporating “cost-containment” measures in cap-and-trade systems, including offsets, allowance banking and borrowing, safety valves, and price collars. (https://scholar.harvard.edu/files/stavins/files/aldy_stavins_pricing_carbon_in_jed.pdf), pp. 157-158.

13. Lucatello, Simon; and Flores, José Eduardo Tovar. 2022. Carbon Finance and Emission Trading in Mexico: Building Lessons from the CDM Experience and FOMECAR (Mexican Carbon Fund). Springer Climate. (https://doi.org/10.1007/978-3-030-82759-5_8).

sation technologies and mitigate the distributional impacts of the energy transition on the vulnerable groups in the society. The impacts of carbon tax and ETS on competitiveness, particularly reducing the so-called “carbon leakage” risk, is expected to be equal. A country's appropriate design and implementation of the carbon pricing instrument might be more important than its choice of specific carbon pricing tools.¹⁴

3. RESEARCH METHODOLOGY

The paper uses the Better Regulation of the European Commission in its approach to:

- Specify the problems that ASEAN faces to reduce its carbon emissions;
- Justify the need to improve the emission mitigation targets of ASEAN member states;
- Identify the purpose statement of the paper; and
- Propose policy solutions that could be effective, efficient and feasible for ASEAN member states.

The paper presents an amalgamation of past research that has been conducted and deemed applicable in the ASEAN context. It also assesses the case study of linking the EU's ETS with Norway's and Switzerland's ETSS, which might be relevant for ASEAN countries if they wish to link their carbon pricing systems. The paper analyses data for group comparisons, trends and possible relationships between countries aiming to be linking partners.

14. Stavins, Robert. 2019. Carbon Taxes vs. Cap and Trade: Theory and Practice. (https://www.belfercenter.org/sites/default/files/files/publication/es-09_stavins_vers2.pdf).

4. CURRENT PROGRESS OF DEVELOPING CARBON PRICING IN ASEAN

Carbon pricing is not a nascent concept in the ASEAN region. Several member states have already made progress in developing this tool, although the stages in their development and choice of specific carbon pricing instruments might vary.¹⁵ ASEAN member states can be categorised into three groups in terms of their approach and progress toward establishing their carbon pricing mechanism.

15. UNFCCC. 2019. Study on cooperative MRV as a foundation for a potential regional carbon market within ASEAN – Synthesis Report. (<https://unfccc.int/sites/default/files/resource/Synthesis%20report%20.pdf>).

Table 2. Grouping ASEAN member states in terms of their progress and approach towards carbon pricing.

| Group | ASEAN Member States | State of the art |
|-------------------------------------|---------------------|--|
| Carbon pricing fully implemented | Singapore | Carbon tax applied uniformly to all sectors since 2019. |
| ETS or carbon tax under preparation | Indonesia | Set legal basis for ETS, issued MRV guidelines, launched a pilot MRV system and pilot ETS. |
| | Malaysia | Proposed a carbon tax in the 12th Malaysia Plan 2021-2025. |
| | The Philippines | Proposed legal framework for ETS. |
| | Thailand | Set legal basis for ETS, developed guidelines and tested the MRV system, implemented pilot ETS, built capacities for stakeholders. |
| | Vietnam | Provided legal basis for ETS, pilot ETS to be launched in 2025. |
| Carbon offset – REDD+ | Cambodia | Member of the REDD+ programme, established carbon offset/credit mechanism. |
| | Laos PDR | Member of the REDD+ programme, established carbon offset/credit mechanism. |
| | Myanmar | Member of the REDD+ programme, established carbon offset/credit mechanism. |
| No plans for carbon pricing yet | Brunei | Not considered or set carbon pricing as a national priority. |

Sources: Authors' compilation.

The **first group** comprises Singapore, which is the only ASEAN member state that has fully implemented a carbon pricing system thus far. Singapore's carbon tax was established in January 2019. This tax applies uniformly to all sectors. The country has also designed its carbon tax system in a way that is compatible with an ETS.¹⁶

16. UNFCCC. 2019. Study on cooperative MRV as a foundation for a potential regional carbon market within ASEAN – Synthesis Report. (<https://unfccc.int/sites/default/files/resource/Synthesis%20report%20.pdf>).

Monitoring, reporting and verification (MRV) is a framework to quantify and track GHG emissions. Technically, MRV can be used at company, sectoral and national levels. Among these levels, the establishment of MRV at company level is an indispensable element of a carbon pricing instrument.¹⁷ MRV helps assure the integrity of the system, enabling the participants of the ETS to determine their emissions and the number of emission allowances that they must obtain.¹⁸ While a good MRV system is a precondition for carbon pricing, planning for carbon pricing can also be one of the ways to advance MRV in member states.

The **second group** is comprised of member states planning for an ETS or carbon tax. Thailand, Vietnam, Malaysia, Indonesia, and the Philippines form this group. While Malaysia is open to both carbon tax and ETS¹⁹, the other four member states tend to have a preference for ETS. These member states have begun setting up several building blocks which are considered the preconditions for ETS:

- **Legal basis for ETS:** All member states have carried out preparatory work, including developing legislation and drafting laws to provide the legal grounds for their ETSs, such as Thailand's proposed "Climate Change Act", Vietnam's revised law on environmental protection in 2020, Indonesia's "Government Regulation on Environmental

17. Ibid.

18. Centre for European Policy Studies. 2015. Accounting for Carbon: Monitoring, Reporting and Verifying Emissions in the Climate Economy. (<https://www.ceps.eu/wp-content/uploads/2015/04/Agenda%20CEPS%20-MRV%2029%20May%202015.pdf>).

19. The 12th Malaysian plan 2021-2025. Available at: (rmke12.epu.gov.my/en).

Economic Instruments” in 2017, and the Philippines’s proposed Bill providing the legal basis for a cap-and-trade system.^{20, 21, 22, 23}

- **Monitoring, reporting and verification (MRV)** systems: Thailand and Indonesia are more advanced in developing their MRV systems in several sectors. Thailand has crafted its guidelines and tested the MRV system in twelve sectors²⁴ since 2015. Indonesia has issued its MRV guidelines and launched a pilot MRV system for the power, cement and fertiliser sectors. Vietnam and the Philippines currently have MRV-related processes at a conceptual level, lacking a clear and adequate pathway on how their GHG inventory process could be upgraded to a MRV system for GHG emissions in the future.²⁵
- **Pilot ETS:** Both Thailand and Indonesia have launched voluntary ETS trials. Thailand’s pilot ETS has undergone two trial periods since 2015, while Indonesia launched a voluntary emissions trading trial for the power sector in 2021. Vietnam’s pilot ETS is expected to kick off by 2025 and become fully operational by 2027. The Malaysian government has also approved the proposal to initiate a voluntary ETS to meet its NDCs targets and act as a way to respond to the EU’s recently proposed Carbon Border Adjustment Mechanism.
- Furthermore, several **capacity-building and outreach activities** have been held in these member states to raise stakeholders’ awareness about the ETS concept, e.g., those in Thailand.

20. icapcarbonaction.com. 2021. ETS Detailed Information – Indonesia. (<https://icapcarbonaction.com/en/ets/indonesia>).

21. icapcarbonaction.com. 2021. ETS Detailed Information – Philippines. (<https://icapcarbonaction.com/en/ets/philippines>).

22. icapcarbonaction.com. 2021. ETS Detailed Information – Thailand, International Carbon Action Partnership. (<https://icapcarbonaction.com/en/ets/thailand>).

23. icapcarbonaction.com. 2021. ETS Detailed Information – Vietnam, International Carbon Action Partnership. (<https://icapcarbonaction.com/en/ets/vietnam>).

24. Including cement, pulp and paper, iron and steel, petrochemical, petroleum refinery, glass, plastic, food and feed, ceramics, beverage and sugar, textiles and flat glass.

25. UNFCCC. 2019. Study on cooperative MRV as a foundation for a potential regional carbon market within ASEAN – Synthesis Report. (<https://unfccc.int/sites/default/files/resource/Synthesis%20report%20.pdf>).

The **third group** consists of member states which have not prepared for an ETS or carbon tax system but are already members of the REDD+ programme. REDD+ countries commit to preventing deforestation and forest degradation in exchange for carbon credits, which they can sell to governments, companies or organisations looking to offset their GHG emissions.²⁶ This group includes Cambodia, Lao PDR and Myanmar. Presently, these member states have not established their MRV system at the facility, sectoral, or national levels. Their preparation of GHG inventory – which is one important component towards developing MRV – is on an ad-hoc basis. These member states tend to rely on external support (mainly from international organisations) under the form of technical or financial support to prepare their GHG inventories.²⁷

The **last group** consists of Brunei, the member state which has not considered or set carbon pricing instruments as a national priority. One possible reason is that Brunei is amongst the lowest emitters in the region and the world.²⁸ Another reason might be associated with the country's economic strategies, which might impact its choice of whether to implement carbon pricing or not.²⁹ Brunei Darussalam has an economy that thrives through the oil and gas sector. The aforementioned factors might explain why the government of Brunei has fewer incentives to put in place a mechanism that values the cost of carbon emissions.

26. ASEAN Secretariat. 2021. ASEAN State of Climate Change Report: Current Status and Outlook of the ASEAN region: Toward the ASEAN Climate Vision 2050. (<https://asean.org/book/asean-state-of-climate-change-report/>).

27. Ibid.

28. UNFCCC. 2019. Study on cooperative MRV as a foundation for a potential regional carbon market within ASEAN – Lao PDR Country Report. (<https://unfccc.int/sites/default/files/resource/Laos%20PDR%20final.pdf>).

29. OECD. 2021. Why should developing countries implement carbon pricing when even advanced economies fall woefully short? (<https://oecd-development-matters.org/2021/02/17/why-should-developing-countries-implement-carbon-pricing-when-even-advanced-economies-fall-woefully-short/>).

5. POLICY RECOMMENDATIONS: PATHWAYS TO IMPLEMENT CARBON PRICING IN ASEAN

This section puts forward the policy options that ASEAN member states can consider to make the best use of carbon pricing tools to achieve their climate targets at both national and regional levels. The policy recommendations are made firstly for member states that have been implementing or are preparing their carbon pricing systems (the first and second group of member states in the above section) (section 5.1). The authors also see potential benefits of using carbon tools even for the ASEAN member states that have not considered them yet (the third group of member states) (section 5.2). Finally, the interaction of carbon pricing with other climate and environmental policies is also discussed (section 5.3).

5.1. Policy Implication for Members Implementing or Planning for ETS and Carbon Tax

ASEAN member states which are preparing to implement a carbon pricing system have a tendency to opt for ETS (Thailand, Vietnam, Indonesia and the Philippines). If ETS is the choice for these ASEAN member states, the question is how they should develop their respective ETSs so as to achieve their climate targets most efficiently. Currently, these member states' approaches toward carbon pricing are relatively fragmented. The lack of integration might incur limitations, particularly the emission mitigation costs and potentials. An alternative mechanism is to link the ETSs of these member states. Sections 5.1.1 and 5.1.2 below assess these two policy options and propose the one that would be more effective and efficient in ASEAN's context.

5.1.1. Option 1 (baseline scenario): Independent national emissions trading systems

This option reflects ASEAN member states' actual approaches towards carbon pricing. The member states have fragmented policies on carbon pricing. There is limited coordination and harmonisation in the design of the ETSs, and no linking of member state ETSs has been established or foreseen for the implementation phase among those who plan to implement carbon pricing systems.

In terms of **effectiveness**, national emissions trading systems can reduce greenhouse gas emissions in sectors or industrial installations where they are implemented at the lowest cost.^{30, 31} An emissions trading system allows regulated companies to choose their approach for compliance, either through deploying decarbonisation solutions or paying for their emissions.³²

The impacts of national carbon markets on *competitiveness* are multi-dimensional:

- Carbon prices introduced through an ETS can increase the production costs in regulated industries in the short term, entailing the so-called “*carbon leakage*” risk. There are concerns that companies operating in a country with a carbon price system in place might lose their price advantage and market share to companies operating in other countries/regions where carbon pricing regulation is less strict. This could shift production and investments toward countries with less stringent carbon regulations.³³ The carbon leakage risk is particularly relevant to industries highly exposed to international trade.
- Empirical evidence shows that in countries with carbon pricing systems, the carbon leakage risk is limited or even not observed. One reason can be that carbon price is not considered a vital factor for production and investment decisions. Other pivotal factors are the regulatory conditions, labour costs and skills, energy costs and proximity to product markets. More importantly, governments can mitigate such a carbon leakage risk by adopting a set of policies, including

30. Asian Development Bank. 2016. Emissions trading schemes and their linking – challenges and opportunities in Asia and the Pacific. (<https://www.adb.org/sites/default/files/publication/182501/emissions-trading-schemes.pdf>).

31. UNFCCC. 2017. ASEAN Countries Join Forces for Climate Action. (<https://cop23.unfccc.int/news/asean-countries-join-forces-for-climate-action>).

32. Ibid.

33. Carbon Pricing Leadership Coalition (CPLC). 2016. What is the Impact of Carbon Pricing on Competitiveness. (<https://thedocs.worldbank.org/en/doc/759561467228928508-0020022016/original/CPLCCompetitivenessprint2.pdf>).

free allocation of emission allowances to trade-exposed industries,³⁴ funding support for the R&D and deployment of decarbonisation technologies, or creation of a market for low-carbon products.³⁵

- *Carbon pricing can also improve competitiveness* despite the concerns about carbon leakage risk. The adoption of carbon pricing can spur innovation and the development of improved technologies that lead to competitive advantages, new market opportunities and economic gain for companies.³⁶ For instance, an increasing number of companies have adopted internal carbon prices so as to gain competitiveness against their competitors. Microsoft applies an internal carbon fee to its business units, and revenue from this fee is used to support the company's investment in energy efficiency and increased use of renewable energy.³⁷ In the long run, when carbon markets are more balanced across countries and the global economy shifts toward low-carbon production, the leakage risks can be further addressed.³⁸

In terms of **efficiency**, the set-up and implementation of a national ETS require financial and human resources, and capacity building for both the authorities and stakeholders.

- First, the *institutional infrastructure* needs to be adapted to allow for a regulatory framework for the ETS, e.g., through reforming/intro-

34. Asian Development Bank. 2016. Emissions trading schemes and their linking – challenges and opportunities in Asia and the Pacific. (<https://www.adb.org/sites/default/files/publication/182501/emissions-trading-schemes.pdf>).

35. Carbon Pricing Leadership Coalition (CPLC). 2016. What is the Impact of Carbon Pricing on Competitiveness. (<https://thedocs.worldbank.org/en/doc/759561467228928508-0020022016/original/CPLCCompetitivenessprint2.pdf>).

36. Ibid.

37. Smith, Brad. 2021. One year later: The path to carbon negative – a progress report on our climate “moonshot”. (<https://blogs.microsoft.com/blog/2021/01/28/one-year-later-the-path-to-carbon-negative-a-progress-report-on-our-climate-moonshot/>).

38. Carbon Pricing Leadership Coalition (CPLC). 2016. What is the Impact of Carbon Pricing on Competitiveness. (<https://thedocs.worldbank.org/en/doc/759561467228928508-0020022016/original/CPLCCompetitivenessprint2.pdf>).

ducing new legislation, and setting up enforcement arrangements.³⁹ Necessary changes in the *market infrastructure* such as establishing auctioning mechanisms are also expected.

- Second, building *MRV* capacity for the ETS authorities and the regulated firms are essential to successfully implementing an ETS. Such a MRV system requires, *inter alia*, technical expertise during the design and implementation phase, capacity and availability of verifiers, establishment of an ETS registry system, and a national data management system for GHG emitters. Both the regulators and the ETS participants must build up their awareness of and capacity for ETS compliance, monitoring, reporting and verification. This entails the need for capacity building and/or setting up of a pilot ETS in the early phase.⁴⁰
- Third, an ETS also requires an appropriate *emissions allocation method*. The ETS authorities must decide on the number of allowances that will be distributed freely or sold to firms through auctioning.⁴¹ This process is complicated as it needs to take into consideration the carbon intensity, carbon mitigation costs and ability of industrial installations to absorb such costs, and the impacts on competitiveness and on final consumers.⁴²
- Fourth, the seamless functioning of an ETS requires a strong *modelling capacity* and reliable and granular *data* to set up the emission caps, measure baseline emissions and monitor/verify actual emissions.⁴³

39. Asian Development Bank. 2016. Emissions trading schemes and their linking - challenges and opportunities in Asia and the Pacific. (<https://www.adb.org/sites/default/files/publication/182501/emissions-trading-schemes.pdf>).

40. Ibid.

41. Aldy, Joseph E. and Stavins, Robert N. 2012. The Promise and Problems of Pricing Carbon: Theory and Experience. (DOI: 10.1177/1070496512442508).

42. Asian Development Bank. 2016. Emissions trading schemes and their linking - challenges and opportunities in Asia and the Pacific. (<https://www.adb.org/sites/default/files/publication/182501/emissions-trading-schemes.pdf>).

43. Ecologic Institute. 2016. Emissions Trading Systems and Developing Countries. (<https://www.ecologic.eu/13616>).

- Last, a *larger participant size* is essential to reduce the MRV costs per unit of emission, thus ensuring that the national ETS is cost-effective and economically beneficial.⁴⁴ The efficiency of an ETS also increases if the ETS covers a large number of participants (thus creating a liquid market for allowances) across a wide range of facilities and sectors with diverse carbon mitigation costs.

Once properly set up and implemented, the *economic impact of an ETS is considered neutral*: on the one hand the ETS imposes a cost on the participants (except for those that benefit from free emission allowances); on the other hand, it reduces the overall emission mitigation costs and creates an additional income stream for governments.

The **feasibility** of establishing a national ETS is *greater in some ASEAN member states than others*. Except for Singapore, which has implemented a carbon tax system, several other large emitters in ASEAN prefer the ETS over other carbon pricing instruments. Some member states are already taking steps to establish their own ETS, though their respective progress varies.

Some *elements contribute to the feasibility of establishing a national ETS* in ASEAN member states. First, with more ETSs set up worldwide, there is a growing wealth of international experiences, best practices, and key takeaways on ETS. These experiences are valuable for ASEAN member states planning to develop their own ETS.⁴⁵ Meanwhile, some conditions have not materialised to ensure the successful implementation of ETS in most ASEAN countries. One of these is the limited sectoral coverage of the planned ETS (in particular the energy sector) in some member states, leading to lower efficiency of the MRV system. Finally, some member states, including Thailand and Vietnam, have raised concerns about emission data's robustness and consistency (especially data at the installation level).⁴⁶

44. Asian Development Bank. 2016. Emissions trading schemes and their linking - challenges and opportunities in Asia and the Pacific. (<https://www.adb.org/sites/default/files/publication/182501/emissions-trading-schemes.pdf>).

45. Ibid.

46. Ibid.

5.1.2. Option 2 (alternative option): Regionally linked emission trading systems

In this option, ASEAN member states can link their ETSs to create a bigger, common carbon market, following the framework set by Article 6 of the Paris Agreement on international carbon markets and linking the emissions trading schemes. Once ETSs are linked, a unit of emission reduction should be equivalent across the member states. The homogenous system permits each member state to trade emissions cross-border seamlessly.⁴⁷

In terms of **effectiveness**, a larger carbon market can decrease the *mitigation costs* in the linked markets thanks to a wider range of decarbonisation options at potentially cheaper costs.^{48, 49} In other words, the cap on the amount of a certain GHG in one ETS with the highest abatement costs can be met by abatement actions in other ETSs with the cheapest costs. Overall, this would entail reducing the participants' compliance costs.⁵⁰ As the linking enables member states to reduce the emission reduction costs, it can also encourage them to set more ambitious *climate targets* and take more collaborative climate actions. *The market becomes more liquid when more participants buy and sell allowances across the linked ETS.* Linking the carbon markets among member states also allows for *better absorption of external shocks and price volatility*. Finally, it can also create a *level playing field* for companies across the linked market and reduce the risk of carbon leakage among the linked markets.^{51, 52}

However, linking the ETSs of ASEAN member states might also lead to several challenges. The linking would entail the potential difficulty in *coordi-*

47. ICAP. 2018. ICAP Guide to Linking Emissions Trading Systems. (<https://icapcarbonaction.com/en/a-guide-to-linking-emissions-trading-systems>).

48. Ibid.

49. Carbon Pricing Leadership Coalition (CPLC). 2016. What is the Impact of Carbon Pricing on Competitiveness. (<https://thedocs.worldbank.org/en/doc/759561467228928508-0020022016/original/CPLCCompetitivenessprint2.pdf>).

50. Asian Development Bank. 2016. Emissions trading schemes and their linking - challenges and opportunities in Asia and the Pacific. (<https://www.adb.org/sites/default/files/publication/182501/emissions-trading-schemes.pdf>).

51. Ibid.

52. ICAP. 2018. ICAP Guide to Linking Emissions Trading Systems. (<https://icapcarbonaction.com/en/a-guide-to-linking-emissions-trading-systems>).

nating supply mechanisms (such as the carbon market reserve) or using international offsets and might weaken a *jurisdiction's capacity for market intervention* since operating a linked carbon market requires a relatively high level of coordination and cooperation among the linking partners. The intervention includes various measures: price-based (price floors/ceilings), quantity-based (adjusting allocation) or flexibility provisions (borrowing, banking, offset). A single jurisdiction might make such unilateral market interventions, e.g., when its government wishes to reform its carbon market to meet new climate ambitions. In the linked market, a unilateral regulatory intervention by one partner would impact the whole market; thus such interventions require a high level of communication, coordination and cooperation among the linking partners. Finally, the linking might incentivise partners to set *lower reduction targets* so as to be able to sell more allowances to the linking markets, thus generating more revenue for their respective jurisdictions.⁵³

In terms of **efficiency**, on top of the effort needed to build a national ETS as discussed in Option 1, linking the ETSs of ASEAN member states might require *additional costs and effort*, in both the preparation and the implementation phase.

- During the *preparation* for ETSs alignment, complex discussions and upfront coordination on ETS design among national authorities would be essential.⁵⁴ The harmonisation of national ETSs might include harmonisation of the cap-setting process, MRV standards, allocation method, enforcement mechanisms, compliance rules, offset and borrowing mechanisms, price containment instruments and other joint elements of the ETSs.^{55, 56} The closer the national systems are aligned, the more complex the discussions between federal ETS authorities

53. Ibid.

54. ICAP. 2018. ICAP Guide to Linking Emissions Trading Systems. (<https://icapcarbonaction.com/en/a-guide-to-linking-emissions-trading-systems>).

55. Asian Development Bank. 2016. Emissions trading schemes and their linking - challenges and opportunities in Asia and the Pacific. (<https://www.adb.org/sites/default/files/publication/182501/emissions-trading-schemes.pdf>).

56. Ecologic Institute. 2016. Emissions Trading Systems and Developing Countries. (<https://www.ecologic.eu/13616>).

will become.⁵⁷ In addition, setting up and monitoring the ETS linkage and trading across the linked markets would call for additional expertise of both the ETS authorities and the market participants; thus, supplementary capacity building might also be needed.

- The authorities must coordinate to ensure the common market is functioning smoothly during the implementation of the linked carbon markets. This coordination mechanism calls for intensive sharing of information and experiences among the partners and between the partners and the market participants. For example, partners must coordinate by using a common registry, auction platform or dispute settlement mechanism.⁵⁸

Meanwhile, the linked carbon market could help to streamline the processes that reduce **administrative costs** for both the system operators and the participants.⁵⁹ Most importantly, linking can help decrease the mitigation costs in the linked markets, as discussed above. While linking ETSs entails additional costs compared to independent national ETSs, the benefits that it brings to the ETS operators and participants are remarkable. Taking both the costs and benefits into account, linking carbon markets is considered to be cost-efficient in the long run.

Regarding the **feasibility** of the option, as discussed in the first policy scenario, ASEAN member states are at different stages of establishing their respective national ETSs. Member states have so far paid *limited attention to the opportunities of aligning their ETSs*.⁶⁰

This is first manifested through member states' unharmonised efforts towards establishing their *MRV* systems, which is a crucial element in linking

57. ICAP. 2018. ICAP Guide to Linking Emissions Trading Systems. (<https://icapcarbonaction.com/en/a-guide-to-linking-emissions-trading-systems>).

58. Ibid.

59. Ibid.

60. UNFCC. 2019. Study on cooperative MRV as a foundation for a potential regional carbon market within ASEAN – Synthesis Report. (<https://unfccc.int/sites/default/files/resource/Synthesis%20report%20.pdf>).

national markets.⁶¹ MRV processes to support the national GHG inventories were highly nationally driven as they were set up in diverse domestic circumstances. In light of diverse national MRV progress, the opportunities to harmonise or align the MRV systems across member states are still limited. Nevertheless, member states have shown interest to support the linking efforts.⁶² The cooperation among ASEAN member states is likely to be in the areas of information and knowledge synergies rather than alignment/convergence of national processes in the short term.⁶³ These cooperation initiatives would eventually enforce the preconditions for linking and serve as a vehicle towards further regional collaboration on carbon markets.^{64, 65}

Trading relationships between ASEAN member states is a vital facet which can also affect the feasibility of building ETS linkage in ASEAN. Countries that are either main or emerging trading partners have greater possibilities of becoming ETS linking partners. Existing trade could facilitate the linking, and thus, would reduce the difference in the compliance costs of the regulated parties in the linked systems. Therefore, this will lower the negative impacts on competitiveness.⁶⁶ In this respect, ASEAN member states' existing and potential trading relationships in some sectors that are either regulated or planned under their ETs can be good starting points for the linking initia-

61. Harmonised MRV is important for aligning carbon markets. The MRV serves as a framework for tracking the emissions at installation level, which is an important condition for establishing and implementing an ETS. More at UNFCCC. 2019. Study on cooperative MRV as a foundation for a potential regional carbon market within ASEAN – Synthesis Report. (<https://unfccc.int/sites/default/files/resource/Synthesis%20report%20.pdf>).

62. ASEAN Secretariat. 2021. ASEAN State of Climate Change Report: Current Status and Outlook of the ASEAN region: Toward the ASEAN Climate Vision 2050. (<https://asean.org/book/asean-state-of-climate-change-report/>).

63. UNFCCC. 2019. Study on cooperative MRV as a foundation for a potential regional carbon market within ASEAN – Synthesis Report. (<https://unfccc.int/sites/default/files/resource/Synthesis%20report%20.pdf>).

64. Asian Development Bank. 2016. Emissions trading schemes and their linking - challenges and opportunities in Asia and the Pacific. (<https://www.adb.org/sites/default/files/publication/182501/emissions-trading-schemes.pdf>).

65. UNFCCC. 2017. ASEAN Countries Join Forces for Climate Action. (<https://cop23.unfccc.int/news/asean-countries-join-forces-for-climate-action>).

66. Asian Development Bank. 2016. Emissions trading schemes and their linking - challenges and opportunities in Asia and the Pacific. (<https://www.adb.org/sites/default/files/publication/182501/emissions-trading-schemes.pdf>).

tive. By way of example, Thailand was the world's fourth-largest steel importer in 2018; Indonesia, Malaysia and Vietnam were among the top-five steel exporters to Thailand.⁶⁷ Likewise, Indonesia ranks third among the top exporters of paper and pulp to Thailand, with the exporting volume having increased by around 20 per cent since 2011.^{68, 69} Another example is Indonesia's recent consideration of exploring opportunities to export its surplus electricity to Singapore. These trading relationships might pave the way for the member states to link their ETSs in the respective sectors.

5.1.3. Recommendation of the best policy option

Consider linking the planned and established carbon pricing regimes of ASEAN member states

ASEAN member states should consider linking their ETSs, which offers a hopeful opportunity for international cooperation across regions in green policy while respecting the autonomy of each member state. Accompanying the growing number of new developments and emergent ETSs, linked ETSs is a complementary bottom-up approach believed to be able to contribute to sustainable development significantly. A linked ETS enhances the cost-effectiveness and reduces future carbon leakages that may occur from unilateral ETSs. Collectively, investments in low-carbon technologies may not anchor economic development. Furthermore, many jurisdictions that have, or are developing, an ETS are exploring the possibility of linking or other forms of cooperation through bilateral talks or broader fora such as the Pacific Alliance.

67. US Department of Commerce. 2019. Global Steel Trade Monitor, Steel Imports Report: Thailand. (<https://legacy.trade.gov/steel/countries/pdfs/2019/q2/imports-thailand.pdf>).

68. Pinyarat, Jindaratsamee. 2020. Import-Export Pulp and Related Material in Thailand and Its Application. (<https://daiwashiryotrading.com/import-export-pulp-and-related-material-in-thailand-and-its-application/>).

69. Trading Economics. 2021. Indonesia Exports of paper and paperboard, articles of pulp, paper and board to Thailand. (<https://tradingeconomics.com/indonesia/exports/thailand/paper-paperboard-articles-pulp-paper-board>).

ASEAN member states that have an ETS under preparation (Thailand, Vietnam, Indonesia, Malaysia and the Philippines) should consider linking their ETSs. Ideally, the linking should start right at the design stages of the ETSs to minimise the harmonisation effort during the subsequent implementation phase. They can observe best practices of ETS design harmonisation, such as the linking of Norway's ETS with the EU's ETS, or the linking of California's ETS with Quebec's ETS. Harmonising key design features during the design phase helps reduce the difficulties and time required to link these ETSs.⁷⁰ However, design alignment is preferred but not technically essential for a link.⁷¹ As Ellerman (2020)⁷² argues, it is essential for each member to first participate in the mechanism; the level of stringency and further harmonisation of the system may be further adjusted. It is also desirable that the ETS design be compatible with Singapore's carbon tax system. By way of example, Indonesia and Singapore have developed MRV guidelines at the facility level for the power sector and the authorities can consider linking Singapore's current carbon tax with Indonesia's future ETS in this sector. Linking an ETS with a domestic carbon tax regime is theoretically possible but considerably more challenging than linking two ETSs. Recent research has shown that such forms of linking can be made possible through the appropriate mechanisms.⁷³

Intermediary steps: MRV, corporate climate risk disclosure and sustainable finance taxonomy

Linking carbon pricing systems is a lengthy and complicated process. To make linking possible, the next important step that ASEAN member states need to embark upon would be aligning their MRV systems, particularly at facility/installation level. First, member states should **identify the sectors**

70. Asian Development Bank. 2016. Emissions trading schemes and their linking - challenges and opportunities in Asia and the Pacific. (<https://www.adb.org/sites/default/files/publication/182501/emissions-trading-schemes.pdf>).

71. Partnership for Market Readiness. 2014. Lessons Learned from Linking Emissions Trading Systems: General Principles and Applications. (<https://www.thepmr.org/system/files/documents/PMR%20Technical%20Note%207.pdf>).

72. Ellerman, Denny. 2009. The EU emission trading scheme: A prototype global system? Cambridge University Press. (doi:10.1017/CBO9780511813207.004).

73. Stavins, Robert. 2019. Carbon Taxes vs. Cap and Trade: Theory and Practice. (https://www.belfercenter.org/sites/default/files/files/publication/es-09_stavins_vers2.pdf).

which would allow the potential linking of their carbon pricing instruments. Member states can consider harmonising existing MRV guidelines. For MRV guidelines still under preparation, member states can assess the potential to develop a joint MRV guideline. MRV systems should not only be harmonised among ASEAN member states, but also aligned with international standards to enhance the credibility of ASEAN's carbon markets, attract substantial sustainable finance and create opportunities to join international carbon trading schemes in the future.⁷⁴ Second, member states can facilitate the alignment of their MRV systems through **sharing knowledge and international best practices**.⁷⁵ One concrete opportunity is member states jointly establishing a knowledge centre on MRV, which could serve as a “one-stop shop” that provides knowledge and experts to help member states build their capacity in harmonising their MRV systems and in ETS-linking generally.⁷⁶

74. Cornillie, Jan; Delbeke, Jos; Egenhofer, Christian; and Vis Peter. 2021. Towards more reliance on carbon pricing in India. (doi: 10.2870/779640).

75. Asian Development Bank. 2016. Emissions trading schemes and their linking - challenges and opportunities in Asia and the Pacific. (<https://www.adb.org/sites/default/files/publication/182501/emissions-trading-schemes.pdf>).

76. UNFCCC. 2019. Study on cooperative MRV as a foundation for a potential regional carbon market within ASEAN – Synthesis Report. (<https://unfccc.int/sites/default/files/resource/Synthesis%20report%20.pdf>).

Box 2. Case studies of linking ETSs.

We are looking at two examples of ETS linkage – between Norway's ETS and the EU's ETS, and between the Swiss ETC and the EU's ETS. This analysis aims to identify the best practices for potential future links between two domestic ETSs.

Norway's ETS was formulated in the early 2000s and was introduced in 2005. It was linked to the EU's ETS in 2008. The linking was considered early in the design of the Norwegian ETS, and its initial similarity with the EU ETS helped facilitate the subsequent linking of the two systems. Linking the Norwegian ETS with the EU ETS occurred in the European Economic Area – European Free Trade Association context. It was achieved by Norway directly adopting the EU ETS directive rather than negotiating a linkage agreement, which reduced the difficulties and time needed to establish the link.

Switzerland took a different approach to link its ETS market to the EU's ETS. In 2020, the EU-Swiss ETS linkage was established with a significant amendment to the Swiss ETS. Harmonisation of key design features in the two systems was not considered in the initial design stage. The Swiss ETS was set up with a strong foundation that included MVR, cap-and-trade, trading periods and allocation methods. However, it is voluntarily based, and penalty schemes are a barrier for the bilateral link with the EU's ETS.

Ultimately, the technical and design features of the ETS must be considered carefully, as it may constitute a barrier against harmonisation between the two systems. For instance, the Norway-EU ETS linkage occurred seamlessly. Yet, linkage is possible even if the two systems are not initially compatible. It does not necessarily require the two designs to be homogenous. In the case of the Swiss-EU ETS linkage, it set a precedent and gave other third countries opportunities to design a linkage system.

Table 3. EU-Swiss ETS linking design features.

| ETS design feature | Sectoral coverage | The use of offsets | Price management or supply control management |
|----------------------|--|---|---|
| Prior to the linkage | Unregulated and limited scope in the aviation sector in the Swiss ETS. | Forest Credits from developing countries are acknowledged by the Swiss ETS but not the EU ETS due to a lack of an identification strategy to know the origin of the offset. | A large deviation between the measuring methods of the two systems. |
| After the linkage | Swiss ETS's extension of sectoral coverage to the aviation sector. | Offsets from Forest Credits are not eligible to be used for the purposes of meeting the compliance obligation. | Swiss legislation reviews the auction volumes. The EU does not subject Switzerland to compliance with its Market Stability Reserve. |

Sources: ICAP (2021a)⁷⁷, ICAP (2021b)⁷⁸, Zetterberg, L. (2012)⁷⁹.

77. icapcarbonaction.com. 2021. Swiss ETS. (<https://icapcarbonaction.com/en/ets/swiss-ets>).

78. icapcarbonaction.com. 2021. EU Emissions Trading System (EU ETS). (<https://icapcarbonaction.com/en/ets/eu-emissions-trading-system-eu-ets>).

79. Zetterberg, Lars. 2012. Linking the Emissions Trading Systems in EU and California, The Mistra Indigo Program, Gotheburg. (<https://www.ivl.se/english/ivl/publications/publications/linking-the-emissions-trading-systems-in-eu-and-california.html>).

Key takeaways from the two case studies:

1. Linking ETSs creates a larger carbon market, reduces total carbon mitigation costs and enhances firms' competitiveness in the linked markets.
2. Linking also helps avoid potential carbon leakage across the linked carbon markets and strengthens international cooperation in achieving climate targets.
3. Compatibility of the technical and design features of the linked ETSs can facilitate the linkage. Homogeneity of the two systems is not an obligatory condition for the linking – slight divergence can still be managed if there is close coordination between the two ETS authorities.

5.2. Policy Implications for Member States Not Yet Planning for a Carbon Tax or ETS

Cambodia, Brunei Darussalam, Lao PDR, and Myanmar can explore the possibility of using carbon pricing instruments as a way to meet their NDCs and support ASEAN as a whole to achieve its climate targets. Though these member states are small emitters compared to others, their GHG emissions have been increasing in recent years (e.g., Cambodia and Brunei Darussalam). While these member states have not considered establishing carbon pricing presently, this tool would support the countries' achievement of their NDCs through different mechanisms. This creates further opportunities for collaboration on carbon pricing among ASEAN member states.

Cambodia, for instance, has observed its GHG emissions in the power sector increase over the last decade. To meet its Intended Nationally Determined Contributions (INDC) target of reducing 65 MtCO₂e out of the baseline emissions of 155 MtCO₂e in 2030 and achieving carbon neutrality by 2050, the country plans to boost the share of renewable energy in its power supply among other measures. Cambodia's strategy of developing new renewable

energy capacity⁸⁰ can help the country not only meet its NDCs commitment, but also allow it to sell the surplus emission reduction units to other ASEAN member states through the regional carbon trading mechanism to support them in meeting their NDCs.⁸¹ The country can leverage the experiences of low-emitting countries joining the linked/regional carbon market as a supplier of emission reduction units.⁸²

Brunei Darussalam will definitely benefit from establishing its own carbon pricing regime. Similar to Cambodia, the country's GHG emissions are relatively small but increasing. The energy sector accounts for 98 per cent of Brunei's emissions. As its national economy heavily relies on the oil and gas sector, the country has maintained low energy prices, making it one of the region's biggest energy consumers per capita. In its NDCs, the country focuses on energy efficiency and conservation to reduce its emissions. Besides the existing tools, including electricity tariff reform and incentives for energy efficiency, Brunei can consider using carbon pricing instruments to achieve the emission reduction targets set in its NDCs in the energy sector. Carbon pricing could trigger the deployment of low-cost mitigation measures to reduce the country's emissions while fostering its energy conservation efforts.

80. The Ministry of Mines and Energy in Cambodia has estimated that the country has 10 GW of unblocked hydro power potential.

81. UNFCC. 2019. Study on cooperative MRV as a foundation for a potential regional carbon market within ASEAN - Cambodia Country Report. (<https://unfccc.int/sites/default/files/resource/Cambodia%20Country%20Report%20Final.pdf>).

82. UNFCC. 2019. Study on cooperative MRV as a foundation for a potential regional carbon market within ASEAN – Synthesis Report. (<https://unfccc.int/sites/default/files/resource/Synthesis%20report%20.pdf>).

5.3. Linking Carbon Pricing to Other Policy Areas

Carbon pricing is not a shortcut solution to achieve the climate targets.^{83, 84, 85} Its design and implementation must fit into a more extensive policy framework that includes policies on electricity markets, renewable energy, or sustainable finance.⁸⁶ These policies can impact the performance of carbon pricing, and vice-versa.⁸⁷

First, coupling carbon pricing with policies on **integrating the ASEAN power market** could make the decarbonisation of the power sector cost-effective and sustainable. Carbon pricing, if implemented alone, would increase the price of electricity. The integration of the electricity market could attenuate foreseeable price shocks. The integrated grid across the region enables ASEAN member states to trade electricity, diversifies the power mix, addresses the variability of renewable energy sources, and allows countries access to low-carbon energy generation.⁸⁸ Some member states have already prepared multilateral power trading mechanisms such as the Lao PDR-Thailand-Malaysia-Singapore Power Integration Project and the integration effort in the Greater Mekong Subregion.⁸⁹ These initiatives can strength-

83. OECD. 2021. Why should developing countries implement carbon pricing when even advanced economies fall woefully short? (<https://oecd-development-matters.org/2021/02/17/why-should-developing-countries-implement-carbon-pricing-when-even-advanced-economies-fall-woefully-short/>).

84. Bataille, Chris; Guivarch, Céline; Hallegatte, Stephane; Rogelj, Joeri; and Waisman Henri. Why carbon prices should and will be different across countries. (http://pure.iiasa.ac.at/id/eprint/15423/1/Hallegatte_Carbon_pricing_1529439093_73_final_clean2.pdf).

85. Stavins, Robert. 2019. Carbon Taxes vs. Cap and Trade: Theory and Practice. (https://www.belfercenter.org/sites/default/files/files/publication/es-09_stavins_vers2.pdf).

86. Ellerman, Denny. 2009. The EU emission trading scheme: A prototype global system? Cambridge University Press. (doi:10.1017/CBO9780511813207.004).

87. International Energy Agency. 2013. Integrating Carbon Pricing with Existing Energy Policies: Issues for Chile. (<https://iea.blob.core.windows.net/assets/imports/events/230/Chilepolicyintegrationfinal.pdf>).

88. Energy Community. 2021. A carbon pricing design for the Energy Community Final Report. (https://www.energy-community.org/dam/jcr:82a4fc8b-c0b7-44e8-b699-0fd06ca9c74d/Kantor_carbon_012021.pdf).

89. ERIA. 8 October 2018. ASEAN Sets New Momentum Moving Towards an Integrated Electricity Market in the Region. (<https://www.eria.org/news-and-views/asean-sets-new-momentum-moving-towards-an-integrated-electricity-market-in-the-region/>).

en the case for linking carbon pricing regimes across the ASEAN member states. The member states should therefore consider the interaction with these cross-border power trade initiatives when implementing and preparing their carbon pricing instruments.

ASEAN member states should consider the interaction effects between carbon pricing policies and **renewable energy policies**. Increases in the carbon price can lift the marginal costs of fossil fuels, making renewable energy most cost-competitive. Governments can use the carbon pricing system's revenue to support renewable energy deployment, achieving ASEAN's joint target of 23 per cent of renewables in total energy supply and 35 per cent in full installed capacity by 2025.

Last but not least, a strong **sustainable finance** framework can support the establishment of carbon markets and leverage private investments in low-carbon projects, thus facilitating the economy's transition towards carbon neutrality. Presently, green finance remains fragmented across ASEAN member states, and numerous national markets are still in the early phases of development. Member states should expand their support for green finance beyond the energy and building sectors, which currently receive the majority of green finance in ASEAN. Building capacity, sharing knowledge among stakeholders, and disseminating information to investors play fundamental roles. Member states can consider aligning with international standards for sustainable finance, which would bring about a common understanding of activities that will contribute to fulfilling climate ambitions.

6. CONCLUSION

Carbon pricing is one of the tools that ASEAN member states can deploy to achieve their emission mitigation targets. This tool is highly relevant in the current context of increased climate ambitions and commitments at the international level, particularly targets set in the National Determined Contributions under the Paris Agreement, new developments under the COP26 and recent net-zero targets of countries around the globe.

ASEAN member states should consider the effectiveness, efficiency and feasibility of the two proposed policy options when preparing and implementing their carbon pricing systems, in particular the ETSs. The alternative option of linking the national ETSs is expected to decrease the total GHG mitigation costs in the linked markets and ultimately help member states achieve more ambitious climate targets than the baseline option. Meanwhile, the alternative option would require a higher level of coordination among member states. Taking all these factors into consideration, linking of national ETSs is still believed to be able to generate higher effectiveness and efficiency than implementing national ETSs separately.

Those ASEAN member states which have not planned for carbon pricing should also consider implementing this instrument to meet their NDCs and support ASEAN as a whole to achieve its climate targets. Among other advantages, joining the ASEAN linked/regional carbon market could help member states expand new renewable energy capacities, increase energy efficiency, and secure an additional source of revenue by selling their surplus emission reduction units to other ASEAN member states.

Finally, carbon pricing is not a short-term solution to achieve climate targets. Carbon pricing design and implementation must fit into a more extensive policy framework, including policies on electricity markets, renewables support, and sustainable finance.

03

Improving and Sustaining Renewable Energy Deployment Through Effective and Efficient Contractual Agreement Frameworks

Despoina Kotsi | Jannata Giwangkara

Abstract

Renewables have become increasingly competitive, representing the world's first-choice option for expanding and modernising a power system. Therefore, aims should focus on re-shaping the policy frame, providing incentives to investors. Redesigning prevailing market practices in project development and finance has emerged as a pressing need, and more specifically, reforming the overly complicated contractual framework should be a priority.* Thus, a joint effort is on the table in order to simplify and streamline the contractual framework with the aim of unlocking greater investments globally. By simplifying and standardising the contractual framework and thereby amplifying negotiations on the interpretation of the terms, all parties involved in a transaction can save considerable time and money. The proposed effective contracts approach belongs in the greater governmental provision of policy incentives destined to mutually benefit private stakeholders. The effective (policy/contractual) framework follows four main principles: collaboration, simplicity, fairness and innovation. *"In fact it increases confidence to offer more efficient new contracts while honouring existing RE contracts. Efficient policies are more credible as there is no need to change them, reducing investor risk and increasing their willingness to invest".*[§] And, in examining the reason behind placing the contractual framework at the core of an investment search policy, we must cast an eye over the first-play significance that contractual agreements have in providing

* Open Solar Contracts v1.0. 2019. By IRENA and Terrawatt Initiative. Available under Creative Commons Attribution-ShareAlike 3.0 IGO license. (<https://creativecommons.org/licenses/by-sa/3.0/igo/>).

§ Newbery D. March 2021. Designing an incentive-compatible efficient Renewable Electricity Support Scheme, EPRG Working Paper 2107 - Cambridge Working Paper in Economics 2128. Available online at: (www.econ.cam.ac.uk/cwpe).

predictable and, thus, balanced results, along with securing away the risk of a dispersed implementation of the contractual ends: *“The contracts have multiple purposes. Primarily, it is both a legal and financial tool that protects both buyer and seller from spot price volatility. Additionally, contracts yield a predictable revenue stream that can be used as collateral for long-term financing of new projects and gives commercial feasibility to existing power plants in markets with significant participation of intermittent RES or of energy sources with low marginal cost. Finally, contracts allocate risks, define liabilities, and offer guidance for action in the case of unanticipated contingencies. Contracts may be analysed by dismantling and assessing their various clauses (e.g., the object, the rights, and obligations, the lag period, the contract duration, etc.). All the contract clauses are correlated and dependent. The choice about how to include them into the contracts, consequently, resembles the fitting together of Lego pieces, which must be placed in a way that allows them to fit together, and form a robust instrument that is as effective and efficient as possible considering the regulatory framework and the energy market maturity”.*[#]

[#] De Barros Correia T., Tolmasquim M. and Hallack M. 2020. Guide for Designing Contracts for Renewable Energy Procured by Auctions, Inter-American Development Bank.

1. THE BACKGROUND / A GENERAL OVERVIEW

1.1. Differences between Fossil Fuels and Renewable Energy Sources¹

In the study we are conducting, we want to make it clear that renewable energy sources as well as the contracts arising from the investments made in this field need special treatment (legal treatment) and especially with regard to the clauses concerning the settlement of all circumstances (actual treatment). In order to have an active field of vision of all the issues that may arise within the contractual framework, but also to know at the same time exactly why contracts for renewable energy sources stand out and have a particularly positive impact on society, we will go through their characteristics and especially with reference to traditional energy sources.

From the overview of the characteristics that differentiate renewable energy sources from fossil fuels, we see that the feature of time replenishment and continuous availability provided by renewable energy sources is prominent. Renewable energy sources, derived from natural resources, have precisely this character of renewing their fullness during an average human life and do not run out for a very long time, until the resources from which they are drawn and the conditions of nature do not permit further employment. Such types of energy are solar, hydroelectric, geothermal, wind, biomass and so on that involve natural resources. Conversely, on the other hand, it takes a long time to naturally replenish fossil fuels. These fuels are natural gas, oil, coal, etc. When comparing renewable energy sources and fossil fuels, it is worth noting that renewable energy sources are likely to meet the need for energy for a comparatively long and multiple-time period, although they may not be available from time to time. For example, if one uses solar panels and it is cloudy outside, the installation will use the battery and pre-stored power to do the work and meet the demand for energy. The same applies to wind turbines when the wind is not blowing.

1. Lavaa A. 29 March 2021. Difference Between Renewable Energy and Fossil Fuels. Available online at: (<https://www.linquip.com/blog/difference-between-renewable-energy-and-fossil-fuels/>).

Especially when it comes to the question of storage of renewable energy sources versus fossil fuels, renewable energy sources are gaining ground in terms of the possibility of preventive storage. However, we have to admit that fossil fuels are in general easier to store compared to renewable energy sources and it is easier for human manipulation to have control over the energy that is captured. The rapid development of technology has led us to find some alternative solutions for easier storage in renewable energy sources.

It's interesting, and worth mentioning in the context of our study of attracting green investment, that since we don't have to do much to replace renewables, they usually cost less than fossil fuels. Although in the past people thought that the use of such energies was rather expensive due to the complexity in planning and implementation, today with the advancement of technology and finding innovative ways to use renewable energy sources, the prices related to the installation and operation of renewable energy sources have become quite affordable or even cheaper than using fossil fuels. Also, let's keep in mind that fossil fuels will first have to be found and extracted and then transported, so they de facto cost much more than using renewable energy sources. The only stage of use of renewable energy sources that can cost more than fossil fuels is the stage of installation of the elements and devices that transfer the energy for the main use, but even at this stage the solution of concession contracts ensures the cash interest.

Another very noticeable and serious advantage of renewable energy sources is their positive environmental effects. The use of renewable energy sources helps to significantly reduce the carbon footprint. One of the most important differences when comparing renewable energy sources versus fossil fuels is that the former is considered "clean energy" and is much more environmentally friendly than the latter. Renewable energy sources do not pollute the air and environment, while fossil fuels usually release carbon dioxide (CO₂) and other types of elements and materials, causing global warming. The use of renewable energy sources (especially solar and wind energy) yields cleaner and cooler air more easily in the long run as a result of eliminating the amount of CO₂ released into the air. This condition as a whole leads to the creation of a better future for the next generations.

The conclusion that emerges from the above is that the supply of energy from fossil fuels inevitably and negatively affects the environment. If we continue to use fossil fuels, they will eventually run out and we will face global warming. On the other hand, the exploitation of renewable energy sources offers the distinct benefits of the possibility of perpetual replenishment, pre-

ventive storage, amenability to using new and innovative technologies to optimise the operation of facilities, shrinking the fierce competition for finding resources due to proportional availability, the elimination of exorbitant costs and finally, being optimistic, we can consider as a long-term positive result the pursuit and achievement of prosperity and peace. For these reasons, the contractual framework and the clauses concerning the actual and legal status of the contracting parties in green investments of this kind, need to have taken special care of the expected benefits and look forward to how the coincidence of the wills of the parties can be interpreted with the public benefit as the denominator. And this is because the interpretation of the public (cash) and operational benefit is not meant to not take into account the positive expectation for each citizen.

1.1.1. Statement of the problem

The problem in this case lies in the terms contained in the contracts signed by investors with the state or its intermediary bodies for the exploration, installation, operation, promotion and production, especially, of energy from renewable natural sources. In particular, the contractual framework in question should be flexible compared to that of traditional forms of exploited energy and separate for renewable energy sources, precisely because it aims to accelerate the attraction of private capital for the immediate and rapid coverage of public energy needs, especially in geopolitical crises that realistically demand energy autonomy. As the contract framework consists of scattered concepts and terms that each time need individual interpretation that delay the operation and payments that should be the driving force for any ambitious project, this study aims to identify precisely the points where it would be testable and allow the application of a single treatment for every contractual issue that needs interpretative treatment. Furthermore, if every renewable energy contract includes specific resolution mechanisms, then the contracting economy gains predictability that entails readiness and efficiency.

1.2. Installed Capacity in ASEAN²

On 6 July 2021, the Executive Director of the ASEAN Centre for Energy (ACE), Dr. Nuki Agya Utama, was invited to deliver a special speech on the topic “ASEAN Renewable Energy Status, Future Trends and Their Role in Energy Transformation” at the ASEAN Energy & Utilities Digital Week.

During the speech, Dr. Nuki Agya Utama stated that through the ASEAN Action Plan on Energy Cooperation (APAEC), the region is committed to achieving the targets on the share of renewable energy sources (RE) of 23 per cent in total primary supply of energy (TPES), as well as the 35 per cent share of installed capacity by 2025. Then, Dr. Nuki explained that there would be a significant increase of about 50 per cent in energy demand from 2005 to 2017 with 662,569 Ktoe energy supply and 393,245 energy consumption. This energy landscape is expected to grow faster in the future.

Regarding renewable energy sources, the installed electricity generation is remarkable. Currently, the electricity production in ASEAN is 1,081,313 GWh while in Europe, it is 2,806,000 GWh, which means that ASEAN needs twenty years to equal Europe’s current electricity production. Also, the major share of electricity generation in ASEAN is still dominated by fossil fuels, which are coal, natural gas and oil.

Furthermore, Asst. Prof. Dr. Bundit Fungtammasan shared his conclusions: According to the APAEC plan, ASEAN committed to a 23 per cent share in TPES and 35 per cent in installed capacity by 2025. ASEAN interconnection with the smart grid will enable a high share of variables of Renewable Energy (vRE) and allow the achievement of ASEAN’s RE target and long-term decarbonisation. Vietnam’s Direct Power Purchase Agreement (DPPA) could accelerate RES investment opportunities, and help achieve commitment to sustainability. International cooperation and research and development (R&D) national goals include the impactful initiative of electric vehicles and biofuels. The United States Agency for International Development (USAID)’s partnership to decarbonise and achieve a more resilient and secure South-east Asia must be advanced.

2. ASEAN Centre for Energy (ACE). 6 July 2021. ASEAN Renewable Energy Outlook. Available online at: (<https://aseanenergy.org/asean-renewable-energy-outlook/>).

1.3. Installed Capacity in the EU³

As the European Union strives to become carbon neutral by 2050, investment in renewables accounted for only 18 per cent of gross electricity consumption as of 2018, meaning the EU is still far from achieving its goal. Wind power is the biggest contributor to renewables in the EU's energy mix. Wind power generation rose to 377 terawatt hours in 2018, having seen the strongest year-on-year growth next to solar. It is therefore not surprising that the wind energy sector is also the most attractive renewable energy sector for investors. In 2018, onshore wind energy alone received approximately US\$24.1 billion in capital investment, more than any other renewable source. The following year, the UK was the country in the EU with the largest wind capacity additions, having installed approximately 2.2 gigawatts of wind turbines. Of the EU countries, Germany has the largest cumulative solar PV capacity. It was also the leading producer of solar energy, with 47,517 gigawatt hours in 2019. Hydropower is one of the so-called first-generation technologies, the first commercialised renewables. However, the use and construction of hydropower facilities and dams – especially large ones – has environmental side effects such as damage to wildlife habitats and its promotion has been hotly debated. While China and Brazil have seen huge growth in capacity additions, in Europe, investment has been more conservative. Norway has the largest total capacity, followed by Turkey, which is still seeking to expand its hydropower resources. Another first-generation technology, bioenergy, is a major contributor to the EU's renewable energy mix. Like hydropower, its inclusion as a renewable source is controversial as scientists debate its carbon footprint. As of 2019, Europe as a whole had 41.4 gigawatts of installed capacity in bioenergy. And in 2018, the EU's primary energy production from solid biomass amounted to 94.3 million tons of oil equivalent. In comparison, energy production from waste reached nearly ten million tons of oil equivalent in the same year.

3. Jaganmohan M. 27 January 2021. Renewable energy in Europe – Statistics & Facts. Available online at: (<https://www.statista.com/topics/4961/renewable-energy-in-europe/#dossierKeyfigures>).

2. EXISTING POLICY CONTEXT – TYPOLOGY OF CONTRACTUAL AGREEMENTS⁴

The construction and operation of an infrastructure requires a series of contracts with all participants, all of which constitute the contractual framework around the construction and operation of a renewable energy facility.

2.1. Preliminary Investigation Stage

- Site survey: Survey carried out by an independent expert on the feasibility of the project and expected annual energy supply.
- Collateral: Any loan agreements secured by a lien on land or other assets.
- Shareholders' Agreement: Includes the capital structure and governance of the project company.
- Management Agreement: Defines the management incentives.

2.2. Installation Preparation Stage

- Supply Agreement: Fixed price and date models may not be available due to the fact that foundation preparation (for example, for offshore farms), turbine or panel sale and the rest of the installation are governed by separate contracts.
- Balance of Facility Contracts: As most Balance of plant (BOP) contractors do not have credit ratings, lenders will require a hold on some

4. International Renewable Energy Agency (IRENA). 10 September 2019. CONTRACTUAL DOCUMENTATION FOR RENEWABLE ENERGY PROJECTS. Available online at: (https://webcache.googleusercontent.com/search?q=cache:54ZvKH_h-FIJ:https://www.irena.org/-/media/Files/IRENA/Agency/Events/2019/Sep/Colombia/Presentation-on-renewable-energy-PPA-design-and-documentation-standardisation-Serkan-Ata-IRENA.PDF%3F1a%3Den%26hash%3D592F1BE307F4A231B74EB1C9EA59B48D9B564785&cd=1&hl=el&ct=clnk&gl=gr&client=avast-a-2).

payment until completion. Balance of plant is a term generally used in the context of power engineering to refer to all the supporting components and auxiliary systems of a power plant needed to deliver the energy, other than the generating unit itself.

- Land agreements: The term should be similar to the useful life of the facility (20-25 years). The contract includes the definition of payments (usually based on gross revenue), the landowner's control rights, exclusivity, non-disturbance provisions, and the scope of damages.
- Planning permits: Legal documents that allow a certain use and/or development on land.
- Environmental consent: For most projects, consent will only be given by local authorities if certain environmental conditions are met. This contract may impose restrictions on operating hours or require additional investment.
- Insurance: Risks that sponsors and lenders cannot allocate may need to be insured against political risk.

2.3. Operation Stage

- Interconnection Agreement: Construction of grid connectivity, long-term supply agreement, completion schedule.
- Turbine/Panel Service Agreement: Provided by supplier with duration of warranty – must be associated with other Operation & Management (O&M) work. Reimbursement is usually based on a fixed fee.
- O&M Agreement: Includes scope of work, indemnification and separate fees, liability, compliance, remedies and dispute resolution.
- Operating licences: If proprietary technology is used, the project company may have to pay to operate the technology under a licence. The length should match the useful life of the infrastructure.

2.4. Promotion Stage

- Power purchase agreement (PPA): The power purchase agreement (mainly with a utility company) includes details of what is being sold (i.e., power, credits, and certificates), peak or off-peak tariff. It also determines whether electricity must be purchased if it is not received or what happens if no electricity is produced.
- Renewable Energy Certificate (or similar): Certificate from a government agency that the project qualifies for feed-in charges or production tax credits.

3. INVOLVED STAKEHOLDERS

In the context of contracts drawn up to implement, operate and perform a green renewable energy investment, the various actors involved take on their own distinct role that corresponds to the particular circumstances of each individual contract.

3.1. In the implementation agreement, the parties involved are the government (represented by, e.g., the Minister of Environment and Energy), the project company as a special purpose vehicle (SPV), as well as the shareholders. The government grants the project company the right to develop, construct and operate, e.g., a power plant (BOO, that is build-own-operate – but can be modified for BOT, that is build-operate-transfer, and BOOT, that is build-own-operate-transfer). The project company is getting support from the government for obtaining the relevant permits etc. In this contractual framework, the purpose is to define the minimum legal framework required for the implementation of the project. One such example is the mechanism of a premature termination of the contract that shows a remarkable interest. It is a put option structure – defining early termination events, the parties' respective rights to terminate and exercise call/put options together with the formulation of the call price (not a panacea for contingent liabilities, but a reasonable solution within the limits of current bankability standards). In the power purchase agreement, the parties involved are the project company, as well as the Off-taker (government-owned or authorised). This agreement assumes grid connection and project location provided by the government

(variations are possible and can be modified for off-grid and mini-grid if there is a buyer). All production is to be purchased by the buyer (Single Buyer), while with liquidity support the PPA award can be made through a competitive or administrative process. In the context of this contract, deemed seller action means that production is payable when the seller can produce but the buyer cannot extract. The purpose of the study of this contract is to determine the terms and conditions under which the electricity produced by the project company will be sold/purchased.

3.2. In the engineering, supply and installation agreement the relationships developed are between the project company and the supplier/project company and installation contractor. The supply agreement includes engineering, design, procurement, supply and delivery – ready for installation. The installation agreement includes installation, installation balance and commissioning.

3.3. In the O&M agreement the parties involved are the project company and the O&M contractor in order to ensure the operation of the facility with a high availability ratio. Key features of this contract are the standard obligations for operation, scheduled maintenance, corrective maintenance, as well as monitoring services. The guarantee is the minimum technical availability during operation.

3.4. In the financing term sheet the parties involved are the project company and the lenders. The term sheet does not constitute a complete contract. It recognises that in practice the preparation of detailed financial documentation cannot be dictated to lenders. The common elements have been compiled and translated into a term sheet. Also, the term sheet is not a complete financing documentation package. Agreements that may need to be signed for a project finance transaction include: senior facility agreements, terms agreements, intercreditor agreements, accounts agreements, equity support agreements, various security documents, senior offset agreements (if any), direct agreements, in addition to project documents, fee letters and possibly others. The purpose of this contractual format is to define the terms and conditions for the financing of the project.

4. THE FORMATION OF POLICY OPTIONS

Matrix Analysis and Discussion (Quantitative)

Based on statistics and given that we wish to accelerate investments in RE, the extent of a provisional scheme in need is accordingly: (a) essential, (b) light, or (c) extended. Depending on the need for progress and optimisation of profit and sustainability, the contractual burden falls on the leading contractual actor depending on the investment expectation, as well as affecting the corresponding part of the contractual commitment. In this case, our working hypothesis will focus on the objectives arising from the drafting of contracts and will connect the targeting of the formulation of the contracts with the data that emerge indicatively in the EU for solar/thermal energy but also for biogas; statistical data that ultimately shape the need that causally leads to the modelling of contracts in a similar way according to the degree and intensity of the risk and the political expediency to achieve profit as well as sustainability.

Figure I. An estimated scale of the contractual intensity in need: (a) essential, (b) light, or (c) extended.

| Parameters | Regions | Tender Document | Power Purchase Agreement (PPA) | Engineering, Procurement, and Construction (EPC) Contract | Operation and Maintenance (O&M) Contract |
|------------------|---------|------------------|--------------------------------|---|--|
| Time (Months) | EU | Essential | Extended | Essential | Light |
| | ASEAN | Mutatis mutandis | Mutatis Mutandis | Mutatis mutandis | Mutatis mutandis |
| Clauses (Number) | EU | Light | Light | Extended | Essential |
| | ASEAN | Mutatis mutandis | Mutatis Mutandis | Mutatis mutandis | Mutatis mutandis |
| Cost (EUR) | EU | Essential | Light | Essential | Light |
| | ASEAN | Mutatis mutandis | Mutatis Mutandis | Mutatis mutandis | Mutatis mutandis |
| Risk Balance | EU | Light | Light | Light | Light |
| | ASEAN | Mutatis mutandis | Mutatis Mutandis | Mutatis mutandis | Mutatis mutandis |

Source: Authors' analysis.

4.1. Solar Thermal Energy in the EU⁵

Solar thermal technology is an extremely cost-effective renewable energy solution that can be used for multiple heating applications, including hot water and space heating for buildings, as well as low and medium temperature heat in the industrial sector. However, the economic potential for solar thermal technology in the EU remains largely untapped. Only a few EU countries have reached significant levels of solar thermal technology development. Cyprus is the leader, with around 0.8 square metres of installed solar panels per capita, followed by Austria, Greece and Denmark. Across the EU, the average deployment level is estimated at around 0.1 square metres of solar panels per capita, resulting in an almost negligible contribution to final energy consumption and well below the realistic potential of this technology in the region.

4.1.1. Time in need

So, in this case, we see the need for absolutely basic contractual commitments in order to mobilise the implementation contract and bring the project into production. On the other hand, in a venture that is still at an early stage and is not widespread, the need for the power purchase agreement must include extensive provisions on the rights and what obligations are to arise, particularly from the production and purchase of energy. At the stage of engineering, procurement and installation the contractual level can be reduced to the most essential, while at the stage of operation and maintenance it is necessary to look for the most viable and skilful solution of the contractual provisions that go beyond the basic content and carry slightly more the danger.

5. European Union and IRENA. February 2018. Renewable Energy Prospects for the European Union, Based on REmap analysis conducted by the International Renewable Energy Agency in co-operation with the European Commission, p. 41. Available online at: (<https://www.irena.org/publications/2018/Feb/Renewable-energy-prospects-for-the-EU>).

4.1.2. Cost performance in need

In this particular case, looking at the cost and examining what space it can occupy within each individual contractual framework, for the implementation agreement, we would say in the case of solar/thermal energy that for the vigilance of the investment between the state and the target company the level of cost prediction could be the basic one, meaning that the investor would be realistically capable to predict the average cost expenditure of the said energy source by a minimum cost documentation in the contract. Secondly, in the power purchase agreement, the role of costs becomes more distinct, since we are talking about generation, purchase and consumption, but it is fair to say that it is limited to just that, so the slight role in cost bearing is justified. Then, in the engineering, supply and installation agreement, just as it happens in the implementation stage, the role of cost is simply essential without boundary conditions, precisely because of both the availability of the source and the investor's access to production. Finally, in the operation and maintenance stage, the cost is proportional to a slight risk for the investor due to the volatile external, natural factors. The role of cost is not essential, but it is subject to the weak influence of natural phenomena, which the contractor has taken into account, and for this reason the cost ranges in the middle level, between a fundamental condition and an increased severity of condition.

4.2. Biogas in the EU⁶

Biogas and its refined form, biomethane, represent an interesting alternative for future renewable energy supply. Compared to other renewable energy sources, biogas has the advantage that it can be used during periods of low wind and solar power. In 2015, the total production of biogas in the 28 countries of the EU corresponded to 653 PJ, or 4 per cent of the region's primary supply of gaseous fuels (natural gas and biogas) (Eurostat 2017b), and

6. European Union and IRENA. February 2018. Renewable Energy Prospects for the European Union, Based on REmap analysis conducted by the International Renewable Energy Agency in co-operation with the European Commission, p. 47. Available online at: (<https://www.irena.org/publications/2018/Feb/Renewable-energy-prospects-for-the-EU>).

came mainly from special crops (51 per cent) and manure (22 per cent) (CE Delft et al. 2016). Biogas production has the potential to increase to 1,683 PJ in 2030 (CE Delft et al. 2016) from the use of available organic waste streams and with the potential to capture biogas from landfills. The greatest growth potentials are found in liquid and solid manure and organic waste. The existence, stability and reliability of the policy framework and support systems appear to be the number one driver in all countries. Both availability of suitable raw materials and waste collection processes for biogas production are also identified as major drivers for the industry.

4.2.1. Clauses in need for simplification

In this case, we also distinguish a graduated scale in the need for simplified clauses in the contract framework. In principle, at the level of application there is a slight risk, which is shaped by the complexity of this special renewable energy that is still under investigation for its utilisation, but at the same time it also shapes the need for flexibility. Then, for exactly the same reasons, the power purchase agreement must both be flexible and reflect the risk from generation to market and consumption. Furthermore, the engineering, supply and installation contract still needs a lot of forecasting, precisely because of the still weak presence of the energy source that is biogas. Finally, the operation and maintenance can be the absolutely essential contractually, as long as it resembles the other contractual versions for the other renewable energy sources, and since the criterion of risk due to ignorance and complexity has been taken into account in the previous contractual stages.

4.2.2. Total risk balance in need

From what we have mentioned above, the averages for each category of clauses in the contractual framework are derived. In order to avoid drawing a general and abstract opinion as to whether the risk assessment in each conventional version should be in the modelling essential, light or extensive, it is now interesting to look at each average and see if it is verified in the example of biogas. Therefore, the risk balance in the implementation contract should be slightly estimated, i.e., taking into account the slight risk borne by the target company, in particular due to the already weak exploitation of the renewable resource in question in terms of know-how. Second, in the

power purchase agreement, again due to the unexpected rate of production and consumption, the risk balance should have a provision that is slightly enhanced relative to the fundamentals. Third, given the gradual but steady stream of utilisation of the renewable resource in question, the engineering, supply, and installation contract and the operation and maintenance contract are both areas where the risk prediction goes slightly beyond the baseline, mainly due to a double political objective: on the one hand to accelerate the use of the specific source and on the other to recognise the special nature of the risk in the person of the producer and the respective contractor and in the person of the unfamiliar consumer on the other.

5. AN ANALYSIS OF POLICY RECOMMENDATIONS

A Qualitative Analysis⁷

5.1. How to achieve the time efficiency goal through an efficient collaboration in the contract documentation and policy formation? Collaboration places inclusivity at the core. The initiative aims to attain an engagement with multiple stakeholders and to balance various perspectives

In order to achieve the implementation and operation of an effective renewable energy supply project aimed at end users, it is necessary to secure the involvement and cooperation of several economic operators, each of whom undertakes to independently, but also in a cooperative spirit, perform a special part of the project, which it is assigned to in terms of a contract. The renewable energy project is just a system in which the various economic actors interact with each other with mutual benefit. This cooperative scheme, in which bilateral and multilateral contractual relations are developed with

7. See to the effect of: a) collaboration, b) simplicity, c) innovation, and d) fairness, some of the standardised clauses of Open Solar Contracts v1.0. © 2019 by IRENA and Terrawatt Initiative. Creative Commons Attribution-ShareAlike 3.0 IGO license. (<https://creativecommons.org/licenses/by-sa/3.0/igo/>).

legal effects, is a complex of commitments between the parties, where the rights and obligations of all actors involved in the project are taken into account, but a clear margin is left to clarify exactly what are the different forms of added contribution of each economic factor to the development of the renewable energy project.

For example, the respective national government is able, when formulating its environmental policy, in particular with regard to the expansion of renewable energy projects, to set more or less ambitious goals. This government choice is a choice of expediency, while the means by which this investment will be achieved (facilitated or slowed down accordingly) belong to the core of government policy, as legislated by the representative bodies and as implemented/executed by superiors, i.e., the hierarchical administrative bodies through the more specific regulations. Somewhere in this context, the concept of state regulatory provision is included. In this case, the state can set environmental aspirations within the limits of its competence, e.g., it can regulate so as to have solar energy produced to be supplied as electricity at affordable prices to final consumers. Thus, the state staff wishes to provide a certain degree of assistance and support to the project company, which undertakes the renewable energy project and which develops, owns, operates and maintains the facility. For this reason, it becomes imperative to draw up an implementation agreement between the state and the project company, as well as to ensure that the project company enters into a power purchase agreement with the buyer for the purpose of selling and purchase, by both sides respectively, of the electricity generated by the operating unit, which ultimately involves serving the needs of individual consumers and society as a whole, while ensuring the project company is responsible for the absorption of its energy reserves. Under this context, the first and primary level of a collaborative relation is generated: that between the government and the project company and its contractors, where the need is persistent for a common market set of technical requirements that ensure environmental compliance. Investors get in the convenient position to easily compare and

contrast and make reasonable choices.⁸ Also, the concept of inclusiveness and collaborative practice entails for the government to take into account the input of multiple stakeholders and experts in determining the technical specifications and requirements.⁹

In turn, the project company, in order to implement the whole project of utilisation of renewable energy, and for the beginning of the project economy, must contract with a number of other economic operators. That is, it must draw up: (a) a supply agreement with a supplier that will concern the engineering, design, care, supply and disposal, e.g., of a photovoltaic system, (b) an installation agreement with the contracting party to whom the installation of the photovoltaic system will be assigned (see park) and which contracting party will be responsible respectively for the engineering, design, maintenance, supply and the disposal of the balance plant. The ultimate balance need of the project translates as securing all the materials and equipment (including spare parts) that are or are planned to be part of

8. Recital 14 of the Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088: *“To address existing obstacles to the functioning of the internal market and to prevent the emergence of such obstacles in the future, Member States and the Union should be required to use a common concept of environmentally sustainable investment when introducing requirements at national and Union level regarding financial market participants or issuers for the purpose of labelling financial products or corporate bonds that are marketed as environmentally sustainable. To avoid market fragmentation and harm to the interests of consumers and investors as a result of diverging notions of environmentally sustainable economic activities, national requirements that financial market participants or issuers have to comply with in order to market financial products or corporate bonds as environmentally sustainable should build on the uniform criteria for environmentally sustainable economic activities. Such financial market participants and issuers include financial market participants that make available environmentally sustainable financial products and non-financial companies that issue environmentally sustainable corporate bonds”*.

9. Recital 38 of the Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088: *“Given the specific technical details needed to assess the environmental impact of an economic activity and the fast-changing nature of both science and technology, the criteria for environmentally sustainable economic activities should be adapted regularly to reflect such changes. For the criteria to be up to date, based on scientific evidence and input from experts as well as relevant stakeholders, the conditions for ‘substantial contribution’ and ‘significant harm’ should be specified with more granularity for different economic activities and should be updated regularly. For that purpose, granular and calibrated technical screening criteria for the different economic activities should be established by the Commission on the basis of technical input from a multi-stakeholder platform on sustainable finance”*.

the installation work and are absolutely necessary to complete the installation. It is pointed out that all materials and equipment that are part of this contract (installation agreement) are not identical and are different from those needed in the context of the work of the supply and the corresponding contract (supply agreement), (c) a finance agreement with the lender that will finance the development of the infrastructure, and (d) an operation and maintenance agreement with a party that undertakes tasks similar to the title of the contract, which are predetermined and do not go beyond the limits, as formulated explicitly and continue exactly with the obligation to operate and maintain, e.g., the photovoltaic infrastructure.

At the core of all these contracts, the project company becomes a “reference centre” that facilitates coordination as it has the privilege of overall management and the individual contractors refer to their “business centre” in order to remove any obstacles and give priority to the solution serving the system. One such example is reporting to the project company. From the start date, e.g., of the O&M contract, the O&M contractor must provide statements of available capabilities and energy to the project company each day, while the project company must comply with the instructions in accordance with the codes and operating and shipping procedures. This obligation to provide availability statements and energy forecasts is in line with the PPA and any modification to this obligation to submit availability statements under the PPA or the O&M agreement must be reflected in each contract; otherwise it is abusive and arbitrary. The O&M contractor must immediately notify the project company that any of the following health, safety or environmental events occurring at the site have occurred. The O&M Contractor identifies and reports: damage or defects in any of the components of the installation, any disconnection of the facility from the network or complete loss of production as well as its return to full production, any significant reduction in availability, the reason for the performance or the supply of energy, any possible, threatened or actual disputes, any penalties or breach notices issued by any authority relating to the facility infrastructure or the performance of O&M services, any breach of applicable law or licence or any circumstances that may cause the refusal to grant, renew or extend any licence. It must also provide the project company with daily information until the consequences of the event caused are resolved.

Seeing the varied interactions between economic and business actors in a complex of contracts that promotes the inclusion and decentralisation of responsibilities, we cannot ignore the need for a contractual clause for the

utilisation of (living and non-living) local resources. The O&M contractor will make a reasonable effort to ensure that any subcontractor makes a reasonable effort to employ nationals of the relevant jurisdiction in its activities (on the basis of non-discrimination but in terms of making opportunities visible) and will from time to time conduct employee training programmes for these employees. For example, for the operation and maintenance of a renewable energy facility, the O&M contractor will make reasonable efforts to ensure that any subcontractor prefers to purchase goods and materials produced within the relevant jurisdiction, provided that those goods and materials are of an acceptable quality and are available on competitive terms.

5.2. How to achieve (Policy/Contract) Simplicity through the clauses' adaptation to the need? Simplicity means that contracts have a lean structure. They are based on clear assumptions, making them easy to understand and implement

In every contract drawn up in support of and operation of the renewable energy installation, the question of clarity and in particular the predictability of costs and benefits is raised.¹⁰ Consequently, a sound contractual framework takes into account the specific circumstances of a project of this nature and of the extent of public interest in order for the parties to make their initial financial planning and to enhance the safety of investors even in this way. As has been stated: *"...the wholesale market is not deemed investable by investors due to future price risk, price volatility, the likelihood of more frequent occur-*

10. Recital 47 of the Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088: *"To avoid overly burdensome compliance costs on economic operators, the Commission should establish technical screening criteria that provide for sufficient legal clarity, that are practicable and easy to apply, and for which compliance can be verified within reasonable cost-of-compliance boundaries, thereby avoiding unnecessary administrative burden. Technical screening criteria could require carrying out a life-cycle assessment where sufficiently practicable and where necessary".*

*rences of price cannibalisation, and the lack of mitigations to protect investors from these risks”.*¹¹

To cover the concept of predictability, it can be incorporated into the grid of the contractual clauses of the operation and maintenance agreement that the O&M contractor must submit the scheduled interruptions of the annual commercial operation of the facility for each specific year, after consulting the project company and jointly estimating the net impact on the production of energy from the said installation, e.g., photovoltaic power, as a result of this operation plan undertaken. For its part, the project company may, during the business days that constitute the project company interruption schedule notification period, request the O&M contractor to reschedule a scheduled interruption in an alternate month and the O&M contractor must make reasonable efforts to satisfy this reprogramming provided it is consistent with the standards of a logical and prudent operator. In either case, the O&M contractor may reschedule a scheduled cessation in an alternate month, provided that the project company has given its written consent to the rescheduling, which consent may not be revoked or unreasonably delayed. Especially for the planned interruptions of the monthly commercial operation of the installation for each specific month, this consent of the project company is considered to be reasonably revoked if the buyer does not provide this consent to the project company in accordance with the terms of the power purchase agreement. If an unplanned interruption occurs, the O&M contractor must inform the project company as soon as possible (and in any case within three hours from the start of the unplanned interruption) about the cause and the expected duration of the unplanned interruption.

A critical consequence is the amnesty clause. To the extent that the O&M contractor is prevented or delayed from performing the O&M services as a result of an excusable event, then the project company must provide the appropriate relief to the O&M contractor from those obligations of the O&M Contractor who is unable to perform due to the excusable event (including, where applicable, exemption from the obligation to pay availability losses or the application of the response time price adjustment) to the extent that this

11. Newbery D. March 2021. Designing an incentive-compatible efficient Renewable Electricity Support Scheme, EPRG Working Paper 2107 - Cambridge Working Paper in Economics 2128. Available online at: (www.econ.cam.ac.uk/cwpe).

forgivable event was not caused or was not part of an act or omission that is the responsibility of the O&M contractor, or any of their representatives, staff or subcontractors.

The O&M contractor must notify the project company as soon as possible of a forgivable event. This notice must, as soon as possible, detail the cause, expected duration, possible remedial measures and estimated cost of the forgivable event and the extent to which the O&M contractor's liabilities are affected by it. The O&M contractor shall, subject to the approval of the project company, take all necessary measures to mitigate the effects of the forgivable event and, as the case may be, to allow the operation of the facility and the resumption of O&M services as soon as possible. For the avoidance of doubt, a forgivable event will not relieve the O&M contractor of its obligations to protect the site or to provide care and custody, unless this forgivable event is also a force majeure event affecting the O&M contractor.

The project company itself is relieved of its obligation to pay the relevant contract price department in relation to any period during which the O&M contractor is not able to fulfil its obligations as a result of an excusable fact that: falls outside the reasonable control of the project company, but otherwise the O&M contractor is liable to the extent that this excusable event is caused by an act or omission of it, in breach of the latter's obligations and is not due to such a Forgivable Event, but is an event of the latter's liability.

Equally interesting is the clarity of the conventional wording for the cost of spare parts for hardware and equipment and in general the deficits that arise and need to be guaranteed by the manufacturer. It is more than obvious that the provision of this clause for the guarantees by the manufacturer seeks to ensure the financial status of the operator so as not to exceed the costs incurred by the latter as a contractor of a contractual relationship that must be balanced. The parties acknowledge and agree that to the extent that the project company has the benefit of any manufacturer with respect to warranties, the project company must ensure that the O&M contractor has full rights so that the O&M contractor can act on its behalf in all claims arising from the guarantees. The O&M contractor must manage and be fully responsible for the management of any claims related to any manufacturer's warranties in relation to any of the components, provided that the project company must make reasonable efforts to assist the O&M Contractor in the fulfilment of this obligation. The O&M contractor will not be required to handle any claim that has no reasonable prospect of success or where the cost of submitting such a claim is disproportionate. This manufacturer's warranty

clause will not apply when the project company has chosen to repair the defect at its own expense. Before making any claim under a manufacturer's warranty in relation to any of the components, the O&M contractor must inform the project company of its intention to do so and in relation to any claim, it must comply with the reasonable instructions of the project company and regularly inform the project company about the progress of the claim. In relation to any component for which there is a manufacturer warranty, the project company may, at the cost of the project company, request the O&M contractor to obtain from the relevant manufacturer an extension of this manufacturer's warranty period, at which time the O&M contractor will make each reasonable effort to meet this request.

It is important for the contractor entity to always be simple, understandable and conceivable. Although the investor remains an equal part of a contract, the investing entity should not bear a disproportionate financial and bureaucratic burden, but instead be facilitated to the execution of its work for the benefit of the project. It is not possible for the contractor to be released from its responsibility, as it is a responsibility related to the vital survival of the operation of the project. The O&M contractor may subcontract any projects and services that include the O&M services, subject to and in accordance with the applicable laws of the relevant jurisdiction, provided that the O&M contractor may appoint a subcontractor only with the prior consent of the project company (which should not be unjustifiably revoked or delayed), unless the value of the subcontract is less than the allowed subcontracting value, in which case such subcontractor may be appointed without the prior consent of the project company and each subcontract provides that the contractor's rights under this subcontract can be assigned to the project company or to a lender. In this case, data (as key performance indicators of private entities) relating to economic activities of private operators engaged in environmental-friendly projects should be visible and accessible in order to facilitate commercial interactions based on sustainable criteria

and to attain the best possible knowledge of the interested parties.¹² If the O&M contractor entity subcontracts any part of the O&M services, it will not be released from any liability or obligation under the contract and remains at all times fully responsible for the execution of the O&M services, despite the default or inability of any subcontractor to perform. If the project company raises any reasonable concerns about the performance or technical adequacy of any subcontractor, the O&M contractor will take all necessary steps to address the project company's concerns. Especially for the quality of the staff, the O&M contractor will provide sufficient staff with the appropriate qualifications and experience to provide O&M services. The O&M contractor will provide the project company with a list of all staff involved in the provision of O&M services, including their qualifications, and will provide up-to-date information to the project company to reflect any changes in staff or qualifications. Immediately upon receipt of an order from the project company, the O&M contractor will remove any person from the site or O&M services who, in the reasonable opinion of the project company, is guilty of misconduct, incompetence or negligence. In addition, the O&M contractor will ensure that he and each subcontractor comply at all times with all health and safety legislations related to O&M services in the relevant jurisdiction. The O&M contractor will prepare and operate its own safety management systems to be agreed upon by the project company, taking into account site rules, perceived risks and any relevant information provided in the applicable specifications.

12. Recital 22 of the Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088: *"In its communication of 20 June 2019 on 'Guidelines on non-financial reporting: Supplement on reporting climate-related information', the Commission recommends that certain large companies report on certain climate-related key performance indicators (KPIs) that are based on the framework established by this Regulation. In particular, information on the proportion of the turnover, capital expenditure (CapEx) or operating expenditure (OpEx) of such large non-financial companies that is associated with environmentally sustainable economic activities, as well as KPIs that are tailored for large financial companies, is useful to investors who are interested in companies whose products and services contribute substantially to any one of the environmental objectives set out in this Regulation. It is therefore appropriate to require the annual publication of such KPIs by such large companies and to further define that requirement in delegated acts, in particular with regard to large financial companies. While it would be disproportionately burdensome to extend such a requirement to smaller companies, smaller companies may voluntarily decide to publish such information"*.

Simplicity is also needed in the allocation of environmental risk. The project company confirms that the environmental clearance certificate is the final and binding environmental clearance required for the construction and operation of the facility and that the facility does not need to obtain similar or additional environmental permits from any other Authority. The O&M contractor will comply with and oblige the O&M contracting parties to comply with all applicable environmental laws and obligations under the land agreement affecting the occupancy or use of the Site by the O&M contractor or any O&M contracting parties. The O&M contractor must also ensure that O&M parties must not illegally use, dispose of, store, process, transport, handle, generate, leach, release or endanger the release of any dangerous substances in, above, below or otherwise affect the location (including soil, subsoil, surface water or groundwater above or below it and the surrounding environment and air above it), or allow any such dangerous substances to migrate from the location. If the O&M contractor discovers any hazardous substances at the site during the execution of the O&M services, the O&M contractor will immediately notify the project company. If the project company or O&M contractor considers, acting reasonably, that the execution of the O&M services may cause or aggravate environmental damage and liabilities arising from the discovery of dangerous substances, then the O&M contractor shall immediately suspend the execution of the O&M services until that O&M services can be safely repeated in accordance with all laws.¹³ The O&M contractor must immediately notify the project company of such suspension. The O&M contractor entity will be released from its obligation to undertake O&M services and the project company will be released from its obligation to pay the relevant part of the price from the moment the O&M contractor suspends the provision of O&M services until the performance

13. Recitals 31-32 of the Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088: provide for the **prevention of the degradation of biodiversity ecosystems and the protection of sustainable forest management.**

of O&M services can be safely repeated in accordance with all laws.¹⁴ The O&M contractor will indemnify, defend and hold the project company safe from and against any and all environmental damages and liabilities caused or incurred by the project company as a result of breach by the O&M contractor or the O&M contracting parties, or any other breach of any applicable environmental law occurring in the locations resulting from the presence of the O&M contractor or O&M parties at the site.

On the part of the project company, the project company must confirm from the outset that from the signing date, as far as the project company is aware, there is no illegal use, presence, suspicious presence, rejection, storage, processing, transportation, handling, production, laundering, release or threatened release of any dangerous substance in, above, below or otherwise affecting the site (including soil, subsoil, surface water or groundwater above or below it and its surroundings and air above it). The project company compensates, defends and keeps one entity, e.g., the O&M contractor, safe from any claims against the O&M contractor or the O&M contracting party for any wrongdoing: (1) caused by the supplier, the contractor of installation, the buyer, the government, the project company, or (2) generated from off-site (outside the installation site) to the extent not caused by the O&M contractor or the O&M party, in relation to: (A) any breach of any applicable environmental legislation occurring at the site; provided that this claim arises solely from the condition of the affected site prior to the signing date and precludes any condition arising from the presence of an O&M contractor at the installation site prior to the signing date; and (B) any unlawful use, presence, suspicious presence, rejection, rejection, storage, processing, transport, hand production, leaching, release or threatened release of any hazardous substances into, in, above, below or otherwise affecting the site (including soil, subsoil, surface water or groundwater above or below them;

14. Recital 34 of the Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088: *“This is in order to avoid that investments qualify as environmentally sustainable in cases where the economic activities benefitting from those investments cause harm to the environment to an extent that outweighs their contribution to an environmental objective. Such criteria should take into account the life cycle of the products and services provided by that economic activity in addition to the environmental impact of the economic activity itself, including taking into account evidence from existing life-cycle assessments, in particular by considering their production, use and end of life”.*

and the surrounding environments and the air above it). In any case, if the O&M contractor discovers any dangerous substances at the construction site when performing O&M services, the O&M contractor will immediately inform the project company.

The clarity of both the obligations of the contract and especially the responsibilities of the O&M contractor is another important prerequisite, when the direct contract with the Lender for the relevant financing of the project is included, which may bring about changes in the attitude of the Contractor. The O&M contractor should be expected, within ten business days at the request of the project company, to submit to the project company a direct agreement with the lender with such modifications that the project company or the lender can reasonably request and agree with the project contractor, provided that under no circumstances will any changes be made that could substantially alter the scope of the O&M contractor's obligations and responsibilities under the O&M agreement. The O&M contractor acknowledges that despite the performance of the O&M agreement, modifications may be required to take into account comments received from the lender or other persons with whom the project company is required to enter into an agreement for the implementation of the project. Consequently, the O&M contractor entity may agree to an extension of its existing obligations, but at the same time the contractor should not unduly oppose modifications proposed by any of the parties, if requested by the project company. The contractor is expected to negotiate in good faith with any of the above parties in order to deal with any comments of a modifying purpose from any side. The O&M contractor further agrees to make such data, reports, certifications and other documents (including detailed pricing information) or assistance that the lender may reasonably request available to the lender or its advisors. A prerequisite cost-benefit analysis is supposed to take place taking into ac-

count the delicate environmental aspects of the project.¹⁵ At the request of the project company, the O&M contractor entity provides legal advice on its ability and authority to enter into and fulfil its obligations under the O&M agreement and the direct lender agreement (if necessary and in force) and confirms: that obligations under these agreements are valid, binding and enforceable to the parties; the ability and power of the O&M contractor to enter into and fulfil its obligations under the parent company guarantee (if applicable); that the obligations of the O&M contractor under the parent company guarantee are valid, binding and enforceable for the contractor.

Finally, clarity is an obligation that is verified during the reading and interpretation of the terms of the contract by the contracting parties and is therefore subject to procedural and substantive guarantees. It is pointed out that the clarity of the contractual terms is a condition that concerns the content of all contracts that are part of the project and are able to affect the agreements of a specific contract between parties. The project company must have provided the other party, e.g., the O&M contractor, with true copies of all project agreements related to the O&M agreement and O&M services. The O&M contractor entity declares that it has checked and understands the requirements set out in the project agreements (provided that these requirements of the project agreements apply to the fulfilment of its obligations under its own contract). After the signing date, if any of the project agreements are amended and provided that this modification affects the performance of O&M services, the project company will promptly provide the O&M contractor with a true copy of the amended project agreement which will then replace the existing copy of this project agreement. Upon receipt of this amended project agreement, the parties will meet to discuss whether this amendment has an impact on the cost and timely performance

15. Recital 8 of the Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088: *“Decision No 1386/2013/EU of the European Parliament and of the Council calls for an increase in private sector funding for environmental and climate-related expenditure, in particular by putting in place incentives and methodologies that stimulate companies to measure the environmental costs of their business and profits derived from using environmental services”*. It refers to the Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 ‘Living well, within the limits of our planet’ (OJ L 354, 28.12.2013, p. 171).

of O&M services and whether an amendment to the O&M agreement is required. The O&M contractor shall not be liable to the project company for any breach of the O&M agreement resulting from the modification of a project agreement not notified to the O&M contractor in accordance with this clause. The O&M contractor will be responsible for the timely and full compliance with the requirements of the project agreements applicable to O&M Services, as notified to the O&M contractor. The O&M contractor will not be liable for any requirements set forth in the project agreements which are irrelevant and do not apply to O&M services. The O&M contractor entity will, save for the above, perform the O&M services and will fulfil its obligations under the O&M agreement, so that no act or omission of the O&M contractor constitutes, causes or contributes to any breach or violation of any of the obligations of the project company in the project agreements creating liability of the latter. The O&M contractor acknowledges that any breach by the O&M contractor entity of its obligations under the O&M agreement may give rise to liability of the project company under the project agreements. The O&M contractor will notify the project company as soon as it becomes aware of any conflict between any term, condition or requirement of the O&M agreement and that of the project agreements. Unless the project company gives a different mandate, the most onerous terms, conditions and requirements prevail.

5.3. How to achieve Innovation through Contract documentation and policy formation? Innovation means applying new thinking to existing practices and mitigating cost in monetary and physical terms. This helps to identify smarter, more effective solutions to produce bankable contract documentation

In the contract, e.g., of operation and management of the installation for the utilisation of renewable energy, the element of flexibility becomes more and more necessary in view of a series of adversities or obstacles that arise during the execution and utilisation of the project. For this reason, it is crucial that the renewable energy landscape is reviewed, the legal framework governing public and private investment is defined, the nature of economic actors is defined, the public benefit to the national economy is made clear, and finally, priority has been given to the uninterrupted service of the consumer. All of the above form the basis for the formulation of conventional clauses that will offer the “smart” solution at an already established level of management.

One such factor of flexibility is the readiness of the entity that contracts with the project company and the “common pole” between them and the Government, so that the latter does not disperse the communication with each economic entity involved in the project separately. Thus, the project company becomes a point of contact and an effective “management centre” if it manages to monitor the obligations of the contractors of all agreements in every aspect of the project. For example, the O&M contractor must perform the O&M services in accordance with the standards of a reasonable and prudent operator, the lender’s performance standards, and all applicable laws, licences and codes (including those that may be related with synchronisation, voltage and reactive power control) as applicable to the O&M contractor or installation. To this effect, all investors should comply with environmental technical specifications preferably at a pre-contractual stage and the project company must assure the monitoring of the compliance following

the obligation of the former to disclose relevant information.¹⁶ In addition, the contractor shall use all new materials, components or parts that are of a suitable quality, are in accordance with the standards of a reasonable and prudent operator, and are of equivalent or better quality than those of the specifications and codes and suitable for the commission of O&M services under the O&M agreement, to ensure the proper operation of the installation according to the specifications, that the availability of the power plant is at any time greater than or equal to the minimum guaranteed availability, and that the energy can be delivered to the delivery point. The contractor makes every effort to ensure that O&M services are not performed when the radiation is above the minimum radiation limit at the peaks of the solar months, if, e.g., it is solar energy. The O&M contractor acts in compliance and in cooperation taking into account all reasonable requests from the supplier and the installation contractor in relation to the correction of defects during the warranty period and all reasonable requests of the project company in relation to fulfilling the obligations of the O&M contractor under the O&M agreement. The O&M contractor must obtain and maintain all permits necessary for the performance of the O&M services. The O&M contractor

16. Recitals 18-21 of the Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088: *“To avoid harming investor interests, fund managers and institutional investors that make available financial products should disclose how and to what extent they use the criteria for environmentally sustainable economic activities to determine the environmental sustainability of their investments. The information disclosed should enable investors to understand the proportion of the investments underlying the financial product in environmentally sustainable economic activities as a percentage of all investments underlying that financial product, thereby enabling investors to understand the degree of environmental sustainability of the investment. Where the investments underlying the financial product are in economic activities that contribute to an environmental objective, the information to be disclosed should specify the environmental objective or objectives to which the investment underlying the financial product contributes, as well as how and to what extent the investments underlying the financial product fund environmentally sustainable economic activities, and should include details on the respective proportions of enabling and transitional activities. The Commission should specify the information that needs to be disclosed in that regard. That information should enable national competent authorities to easily verify compliance with that disclosure obligation, and to enforce such compliance in accordance with applicable national law. Where financial market participants do not take the criteria for environmentally sustainable investments into account, they should provide a statement to that end. To avoid the circumvention of the disclosure obligation, that obligation should also apply where financial products are marketed as promoting environmental characteristics, including financial products that have as their objective environmental protection in a broad sense”.*

must provide the project company with reasonable assistance, information, details and documentation, as the project company may request from time to time in relation to O&M services. The O&M contractor must provide all necessary work, supervision, professional and technical assistance, equipment, materials, inspection, transfer and testing required for the proper performance of O&M services in accordance with the laws of the relevant jurisdiction.¹⁷ When performing O&M services, the O&M contractor must use appropriately qualified and trained workers taking into account the nature of the work carried out in accordance with the laws of the relevant jurisdiction. If the project company (acting logically) requests the removal of any person from the site or the performance of O&M services, the O&M contractor must remove that person and replace them with a suitable alternative. The appointment of any such alternative is subject to the prior written approval of the project company (provided that the proposed solution is not unduly obstructed). The O&M contractor must maintain the site free from the accumulation of used materials, debris, waste or waste generated as a result of the performance of O&M services. The O&M contractor must maintain the proper operation of the installed security system to the extent required by O&M services to secure the installation and as far as reasonably possible to

17. Recital 35 of the Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088: *“Recalling the joint commitment of the European Parliament, the Council and the Commission to pursuing the principles enshrined in the European Pillar of Social Rights in support of sustainable and inclusive growth, and recognising the relevance of international minimum human and labour rights and standards, compliance with minimum safeguards should be a condition for economic activities to qualify as environmentally sustainable. For that reason, economic activities should only qualify as environmentally sustainable where they are carried out in alignment with the OECD Guidelines for Multinational Enterprises and UN Guiding Principles on Business and Human Rights, including the declaration on Fundamental Principles and Rights at Work of the International Labour Organisation (ILO), the eight fundamental conventions of the ILO and the International Bill of Human Rights. The fundamental conventions of the ILO define human and labour rights that undertakings should respect. Several of those international standards are enshrined in the Charter of Fundamental Rights of the European Union, in particular the prohibition of slavery and forced labour and the principle of non-discrimination. Those minimum safeguards are without prejudice to the application of more stringent requirements related to the environment, health, safety and social sustainability set out in Union law, where applicable. When complying with those minimum safeguards, undertakings should adhere to the principle of ‘do no significant harm’ referred to in Regulation (EU) 2019/2088, and take into account the regulatory technical standards adopted pursuant to that Regulation that further specify that principle”.*

protect the installation from theft and vandalism. The O&M contractor must not increase the contractual capacity without the prior written consent of the project company. The O&M contractor must maintain the settings of all protective relays installed in the installation at levels notified by the project company from time to time and not change these settings without the prior written consent of the project company.

The flexibility of a contractor to meet a surplus of requirements in view of increased needs for the overall completion of the project is crucial. For example, if the O&M contractor is required at any time by the reasonably acting project company to perform additional services, the O&M contractor must not later than ten business days upon receipt of the Project Company's notice provide a written proposal to the project company describing in detail its proposed methodology for the execution of the additional services, as well as the cost of performing the additional services based on the standard interest rates, taking into account any reduction of the planned maintenance services, the correctional services, maintenance or monitoring services that may arise as a result of the requirement for additional services. Upon receipt of a proposal from the O&M contractor, the project company may, at its discretion, at the latest ten working days from the receipt of the proposal, instruct the O&M contractor to execute the entire or part of the additional services on the basis of the proposal by the O&M contractor or not to perform any of the additional services or to require the O&M contractor to provide further details, justification or modification of its proposal. Payment for the performance of additional services is invoiced separately upon completion of these additional services or at such other intervals as may be agreed between the parties. The O&M contractor is not entitled to receive such payment for additional services: (a) unless an order has been given by the project company to perform the applicable additional services and the works are in excess of the amounts approved by the project company, (b) to the extent that the additional services are required as a result of a breach of the O&M agreement. A project company can inform the O&M contractor entity that it has a maximum of ten business days to correct its failure (or such a reasonable period of time depending on the nature and severity of the failure). And if the O&M contractor fails to rectify the failure before the end of the period required to notify the project company, the project company has the right to tender and outsource the operation and maintenance of the O&M services to an alternative contractor, if the previous O&M contractor is unable to provide them and to the already existing cost of the services,

which will be recoverable from the project company as a debt of the previous contractor to it.

In the concept of innovation regarding the large projects for the utilisation of renewable energy sources, are added the technological means that facilitate the control and monitoring of the proper execution and operation of the works throughout the project. Once the project company has installed the monitoring system, it must provide authorisation in favour of the O&M contractor during the O&M agreement so that the contractor can access the monitoring system, the portal and all the data so as to legally and seamlessly on the part of the O&M contractor perform the monitoring of the services performed. The O&M contractor must inform the project company as soon as possible if there is any fault or error with the monitoring of the system or the portal or there is a gap in the monitoring data in relation to the operating installation or if the O&M contractor is not able to monitor the data from the monitoring portal at any time during the period, twenty-four hours a day. Upon receipt of the failure notice from the O&M contractor, the project company should make every effort to recover any lost tracking information or those that the O&M contractor was unable to see at the portal as a result of failure and makes this data available to the O&M contractor for display in an appropriate format. In the other case, where the O&M contractor has installed the monitoring system itself, it should respectively ensure that the monitoring of the data is available in an appropriate form under the same conditions to the project company or to any person authorised by the company to ensure that the project company or any person authorised by the project company always has access to all monitoring data in relation to the overall performance of the power plant and that there are no gaps in these categories of monitoring data.

5.4. How to achieve fairness through contract documentation and policy formation? Fairness means balancing risk allocation. Investment risks are allocated among stakeholders in a fair and balanced manner. Based on a well-defined risk universe, each set of risks is allocated to the party best able to manage them in a cost-effective manner

In the scheme of cooperation between the state that awards the implementation contract and the private economic operator that undertakes the implementation of the renewable energy project, a risk balance emerges through the undertaking and the enjoyment of rights, which are successively able to sharpen or mitigate the position of responsibility of each subject. In this regard, the investor's position gets improved through government assistance, namely through the provision for contractual clauses concerning guarantees in favour of the legal position of the investor in the state where the project is hosted, while finally the investor's confidence is strengthened from the fact that the national state as a contracting party confirms through a contractual guarantee clause that it protects the smooth execution of the works, in view of situations that may occur specifically for the implementation of such nature projects of renewable energy. In general, where there is a case of force majeure, the investor's position must be balanced vis-à-vis the state (especially if there are economic consequences), because an inequality in the relationship between the two is presumed.

In the context of a defined unequal relationship, of an imbalanced relationship between the state and a private company, the government is called upon to provide a number of facilities, which it is hoped will be contracted (to become part of the contract) for greater security and trust on the part of the investor. First of all, subject to the terms and conditions of project agreements, the finance agreements and the authorisations, the government has already identified the final consumer as a buyer of electricity generated by the Installation and urges the buyer to enter the PPA with the project company. The government grants to the construction company for the duration of the implementation agreement, the exclusive right to design, finance, insure, construct, own, operate and maintain the facility, as well as provides the construction company for the duration of the contract, all necessary access rights in the network, in order to enable the connection to the network.

The government shall provide all reasonable assistance, including information on sustainable compliance,¹⁸ to the project company and its contractors in obtaining licences and shall expedite or support the expeditious consideration of such applications and, in the event of an extension of the PPA, the appropriate extension of such licences.

Furthermore, the provision of tax and customs incentives is important in balancing the business risk undertaken by the investor. Thus, after evidence of the tax registration, the government ensures that the project company (and any contractor dealing with the project company in relation to the project) benefits from customs and tax incentives in accordance with the law of the relevant jurisdiction during the exemption tax period, and exemption from customs duties, sales tax and/or value added tax on goods and equipment, subject to the relevant tax legislation provided for project-related activities. The tax exemption also applies to components related to such goods and equipment, as well as to goods, factories, equipment and machinery imported for the purposes of the preparatory activities for the development of the project. Furthermore, the government, in accordance with the law of the relevant jurisdiction, grants facilities to the project company and to each of its contractors in intermediate bureaucratic procedures, as may be required in the relevant jurisdiction to settle the operational needs of the project: e.g., economic operators to open and maintain bank accounts inside and outside the relevant jurisdiction, but also the ability to freely convert local currency or any kind of foreign currency into another currency and to move and transfer (including transfer abroad) without restrictions, money and funds (whether

18. Recital 6 of the Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the **establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088**: *“In its communication of 8 March 2018, the Commission published its action plan on financing sustainable growth, launching an ambitious and comprehensive strategy on sustainable finance. One of the objectives set out in that action plan is to reorient capital flows towards sustainable investment in order to achieve sustainable and inclusive growth. The establishment of a unified classification system for sustainable activities is the most important and urgent action envisaged by the action plan. The action plan recognizes that the shift of capital flows towards more sustainable activities has to be underpinned by a shared, holistic understanding of the environmental sustainability of activities and investments. As a first step, clear guidance on activities that qualify as contributing to environmental objectives would help inform investors about the investments that fund environmentally sustainable economic activities. Further guidance on activities that contribute to other sustainability objectives, including social objectives, might be developed at a later stage”.*

denominated in local currency or any other currency) in bank accounts both in the relevant jurisdiction and abroad.¹⁹

Subject to the provisions of the land agreement, the government will provide or auction the site together with all necessary permits, facilities or passageway works that will allow the project company to carry out the project. Nothing in this clause precludes the construction company from acquiring the space from a third party at its own cost, instead of the government providing or auctioning off the space to the construction company. In the event that the project company chooses to procure the site from a third party, the provisions of the implementation agreement relating to the government's obligations regarding the site do not apply. When the government has provided or auctioned its supply, the project company may advise the government from time to time in the face of difficulties in enforcing the site rights if any. The difficulties create a significant chance that the project company will be prevented or significantly affected in fulfilling its obligations under the PPA, so at the request of the project company, the government will resolve such difficulties, within a time period that will allow the project company to comply with its obligations under the PPA.

Especially with regard to the facilities provided to the investor in relation to the regulatory framework and licensing, primary reference should be made to the grid connection agreement. This is the requirement to connect the provider to the national grid, which comes under the state's supervision to ensure the serviceability of citizens in consumable energy. For this reason, reference is made in advance to the grid connection contract, as it carries the most institutional weight: it incorporates a handful of regulatory requirements on the part of the state, in order to control and guarantee by the state the suitability of the candidate energy provider, the fact that the supply is carried out through the special regime of renewable energy sources and the guarantees that must exist in this case. The government provides

19. Recital 9 of the Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088: *"Achieving the SDGs in the Union requires the channeling of capital flows towards sustainable investments. It is important to fully exploit the potential of the internal market to achieve those goals. In that context, it is crucial to remove obstacles to the efficient movement of capital into sustainable investments in the internal market and to prevent new obstacles from emerging"*.

the timely support needed to facilitate any interaction required between the project company and the competent authorities. In return, the government should have the right from time to time, and in a time not less than forty eight hours from the written notice, to appoint up to two representatives who are entitled to access the site at reasonable times and for the purposes of the inspection of the facility and in particular to verify the compliance of the project company with its obligations under the respective contract and/or the PPA, provided that the government will ensure that its representatives must comply with health legislation and safety, site safety requirements and any other reasonable requirements of the project company and its contractors and that they should not interfere with the manner of construction, operation or maintenance of the facility.

The project company must not be legally incompetent, in order to expose the project to risk of non-completion and therefore to the detriment of the state and ultimately the consumers themselves. The project company guarantees that both at the date of signing and at the date of execution of the project, it is a company in the legal form defined, validly existing under the laws of the relevant jurisdiction and has all the required legal powers and authority to execute the contract and comply with the terms and conditions contained therein. The obligations of the project company under the implementation agreement and its obligations under the PPA are legal, valid and binding and enforceable towards it in accordance with the terms of the implementation agreement and the PPA. The execution of the implementation agreement and/or the PPA by the project company is not and will not be opposed: to the statutory documents of the project company, in any decision of any authority or arbitrator that binds the project company, to the best of its knowledge, the laws of the relevant jurisdiction (in force from the date of signing) or any contract or obligation to which the project company is a party or to which the project company is committed. The company ensures that there are no litigation, arbitration, investigation or administrative proceedings or to the best knowledge of the project company (having done all reasonable investigations), the latter are not threatened against it or any of its contractors, which may significantly adversely affect the ability of the project company to carry out the project. Furthermore, the project company ensures that it is not subject to: any obligation or non-compliance, which may have a significant adverse effect on its ability to undertake the project. Also, the company guarantees to the best of its knowledge that is not subject to procedures or other measures that might have been taken e.g. liquidation

is not threatened – voluntary or involuntary, temporary or final –, judicial management – temporary or final–, rescue of the project company or the appointment of a liquidator, judicial director or similar officer to it or to any of the its assets). Finally, the project company certifies that the copies of the executed project agreements submitted to the government are true and complete copies and there are no other documents that replace them or are related to any such project agreements, which would significantly affect the execution of the agreements, and should therefore have been made available to the government by the project company.

In the field of the imbalance between the state and the investor, the case of the financial destabilisation of the interests of the parties due to an external (non-contractual) event is added. If, e.g., a change in the law (other than an extreme and fundamental change in the law) happens and whichever party believes that this change in legislation has or will result in costs or cost savings, that party will provide the other party in a timely manner a notice identifying that change in the law, and indicating the net amount of costs or savings that have occurred or may reasonably be expected to result from that change. The project company uses reasonable efforts to minimise these costs or to maximise savings according to the standards of a reasonable and prudent manager. To the extent that the claim for costs or savings resulting from the change in the law is not disputed or has been resolved and is allowed under the dispute resolution process, the parties seek to agree on an amount payable. The contracting parties shall endeavour to demonstrate that these amounts are to be paid by increasing or decreasing energy consumption tariffs or, if this is not possible, in accordance with prudent practice, by a lump sum. They argue that the result of one solution or another is the placement of the project company in the same overall financial position, as if the change in the law had not occurred, provided that if the change in the law requires the project company to suffer additional capital expenditures (which form all or part of the claim for expenditure) for which the project company is unable to raise additional funds under financing agreements or to secure additional debt financing from a third party lender as it has reasonably endeavoured, then the parties agree that the payment will be at a flat rate for placing the project company in the same overall financial position as it would have been in if the change in law had not occurred. If the change in the law has been notified accordingly and the project company has or will incur costs as a result of this change in law, the government rec-

ognises that the project company may suspend the performance of these obligations (if any) under a project agreement whose contractual obligations no longer comply with the law as a result of the change in law.

CONCLUSION

Since the policy of investing in the renewable energy sector is highly on the agenda of European Union institutions (See in concreto: the European Fund for Strategic Investments, the European Investment Advisory Hub and the European Investment Project Portal),²⁰ the provisions described above derive from the need to meet the needs of internal and foreign investors, as they form the suitable basis for a standardised contractual framework that mutually benefit, by allocating the risks, all the public and private operators involved in the different aspects of ongoing sustainable projects of renewable energy.

20. See to this effect the Regulation (EU) 2015/1017 of the European Parliament and of the Council of 25 June 2015 on the European Fund for Strategic Investments, the European Investment Advisory Hub and the European Investment Project Portal and amending Regulations (EU) No 1291/2013 and (EU) No 1316/2013 — the European Fund for Strategic Investments.

04

The Challenges of Energy Transition Towards Net Zero Policy in the EU and ASEAN

Phimsupha Kokchang

Abstract

As the largest producer of global emissions, the energy sector holds the key to addressing the current global climate crisis. By replacing carbon-emitting coal, gas, and hydrocarbon energy with carbon-free wind and solar energy, carbon emissions might be drastically decreased. An increasing number of nations are committing to net-zero emissions, resulting in a global readjustment of energy and climate ambitions. Numerous parties, including national and subnational governments, corporations, and coalitions, are creating net zero targets for 2050 in order to achieve these goals. Nevertheless, objectives can change based on the scope of emissions covered, the time, and the accumulation of emissions. This research seeks to identify the most significant obstacles and opportunities connected with achieving net-zero emissions in the EU and ASEAN nations. Both view the possibility for collaboration in the development and utilisation of renewable energies for energy transition as a very promising and essential aspect of achieving climate ambitions. Decarbonisation of the ASEAN energy sector will play an important role in addressing climate change and greening the economy. There are certain parallels between the EU and ASEAN nations, but there are also substantial differences that impede integration and collaboration in various fields, including energy policy.

1. INTRODUCTION

The Paris Agreement aims to limit global temperature increases to 1.5°C to 2°C. The energy sector now accounts for around three-quarters of Greenhouse Gas (GHG) emissions and is critical to minimising the severe implications of climate change¹. The energy sector, being the largest source of global emissions, holds the key to addressing today's global climate crisis. Substituting wind and solar energy for carbon-emitting coal, gas, and oil-fired energy would drastically reduce carbon emissions. Currently, more than 90 countries have established net-zero emission targets, accounting for roughly 78 per cent of global emissions². Thirty-three countries and the European Union (EU) have set such a goal, either through legislation or policy documents³. More than 100 countries have proposed or are considering net zero targets. In addition, net zero targets indicated in a party's nationally determined contributions (NDC), long-term low GHG emissions development strategy (LTS), domestic law, policy, or high-level political commitment are eligible.

Net-zero emissions refers to the achievement of an overall balance between GHG emissions generated and GHG emissions removed from the atmosphere⁴. According to United Nations Framework Convention on Climate Change (UNFCCC) (2015), this is in line with Article 4.1 of the Paris Agreement, which states that “a balance between anthropogenic emissions of greenhouse gases by sources and removals of greenhouse gases by sinks must be achieved in the second half of this century [...]”⁵. The implementation of

1. Bouckaert, Stéphanie, Araceli Fernandez Pales, Christophe McGlade, Uwe Remme, Brent Wanner, Laszlo Varro, Davide D'Ambrosio, and Thomas Spencer. 2021. Net Zero by 2050: A Roadmap for the Global Energy Sector. OECD iLibrary. (<https://doi.org/10.1787/c8328405-en>).

2. Climatewatchdata.org. 2022. Net-zero-tracker. (<https://www.climatewatchdata.org/net-zero-tracker>).

3. Climateactiontracker.org. 2022. Net-zero-targets. (<https://climateactiontracker.org/methodology/net-zero-targets/>).

4. Netzeroclimate.org. 2021. What is net zero? (<https://netzeroclimate.org/what-is-net-zero/>).

5. Climateactiontracker.org. 2021. Net zero targets. (<https://climateactiontracker.org/methodology/net-zero-targets/>).

national net zero targets can play a crucial role in limiting global warming to 1.5°C. To do so, emissions of carbon dioxide (CO₂) and other GHGs must fall rapidly to zero between 2050 and 2070. As a result of this envisioned goal, emissions should fall to the point where they are net negative⁶.

2. STATEMENT OF PROBLEM

As the utilisation of fossil fuels for energy needs is the primary source of GHG emissions, fossil fuels such as coal must be phased out. The process of achieving net-zero GHG emissions is energy transition, which is alternately referred to as “decarbonisation” of the energy system⁷. The global energy system must shift from fossil-based sources to low- or zero-carbon sources, such as renewable energy, by the second half of this century.

Renewable energy sources such as solar, wind, and hydrogen, and energy efficiency measures have the potential to bring down carbon emissions by 90 per cent⁸. Although a global energy transition is currently underway, additional action is required to reduce carbon emissions and mitigate the effects of climate change. As more nations commit to net-zero emissions, global energy and climate goals are rebalancing. Many stakeholders, including national and subnational governments, corporations, and coalitions, have set net zero targets for 2050 in order to achieve these objectives. However, targets can differ in terms of scope of emissions covered, the timeframe, and the aggregation of emissions⁹.

In the Paris Agreement, countries agreed to “achieve a balance between anthropogenic GHG emissions by sources and removals by sinks during the second half of the century.” (Net zero climate, 2021). Typically, net-zero GHG

6. IPCC.ch. 2018. Glossary. (<https://www.ipcc.ch/sr15/chapter/glossary>).

7. Bouckaert, Stéphanie, Araceli Fernandez Pales, Christophe McGlade, Uwe Remme, Brent Wanner, Laszlo Varro, Davide D'Ambrosio, and Thomas Spencer. 2021. Net Zero by 2050: A Roadmap for the Global Energy Sector. OECD iLibrary. (<https://doi.org/10.1787/c8328405-en>).

8. IRENA.org. 2021. Energy transition. (<https://www.irena.org/energytransition>).

9. UN.org. 2021. Net zero coalition. (<https://www.un.org/en/climatechange/net-zero-coalition>).

emissions are achieved with significant negative CO₂ emissions offsetting the remaining GHG emissions¹⁰. Even in modelled scenarios, the path to global net-zero, net-negative emissions – and the timing of this – is uncertain. The quicker countries decarbonise, the lesser the cumulative emissions they will have produced by the time they reach global net zero, which will increase the possibility of limiting maximum warming to 1.5°C^{11,12}.

3. DISCUSSION OF EXISTING POLICY CONTEXT

3.1. EU Energy Transition Pathways to Net-Zero Emissions

3.1.1. EU 2050 Long-term strategy

The EU has been at the forefront of international efforts to mitigate the effects of climate change. National Energy and Climate Plans (NECPs) and LTS plans of the European Union member states (EU27) determine national contributions to the EU energy-climate goals. Currently, these objectives are paramount instruments for promoting decarbonisation in the EU¹³.

For the first time, the EU has established a uniform climate law, with the specific goal of working toward long-term climate policies. All relevant EU institutions reached an agreement in April 2021 to codify the EU's goal of reaching net-zero emissions by 2050¹⁴. The law, which is a step toward “net-zero” emissions by 2050, also includes a target of reducing carbon dioxide

10. UN.org. 2021. “Vague” net zero promises not enough: planet still on track for catastrophic heating, UN report warns. (<https://news.un.org/en/story/2021/10/1104012>).

11. Climateactiontracker.org. 2021. Net zero targets. (<https://climateactiontracker.org/methodology/net-zero-targets/>).

12. UN.org. 2021. “Vague” net zero promises not enough: planet still on track for catastrophic heating, UN report warns. (<https://news.un.org/en/story/2021/10/1104012>).

13. Ilaria Perissi and Aled Jones. 2022. Investigating European Union Decarbonization Strategies: Evaluating the Pathway to Carbon Neutrality by 2050. Sustainability. (<https://doi.org/10.3390/su14084728>).

14. Europa.eu. 2021. 2050 long-term strategy. (https://ec.europa.eu/clima/eu-action/climate-strategies-targets/2050-long-term-strategy_en).

emissions by 55 per cent below 1990 levels by 2030¹⁵. As illustrated in **Figure 1**, the EU has launched the first tranche of its “Fit for 55 per cent” measures, which are intended to support Europe’s climate policy framework and put the EU on track to reduce carbon emissions by 55 per cent by 2030 and achieve net-zero emissions by 2050¹⁶.

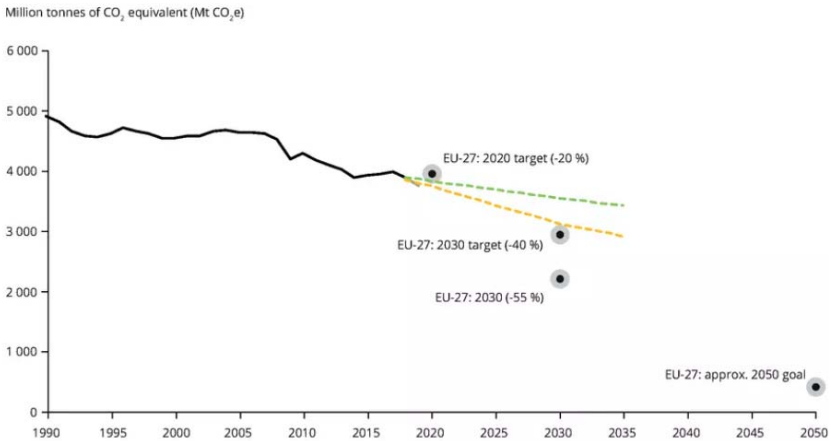
The “Fit for 55” package is a collection of policy proposals from the European Commission aimed at achieving the 55 per cent reduction objective. These proposals must be adopted jointly by the European Parliament and the Council in order to enter into force. The package includes several modifications to existing policies and new emission reduction measures. Major proposals include a carbon border adjustment mechanism (CBAM), emission reduction targets for each member state, a revision of the EU emissions trading systems for transportation and buildings, and the EU tax directive, among others. All the commission’s proposals demonstrate EU leadership in the transition to carbon neutrality. The “Fit for 55” package will aid the region to reduce its emissions and put it on track to meet the Paris Agreement’s 1.5°C warming limit¹⁷.

15. EEA.eu. 2022. Total greenhouse gas emission trends and projections in Europe. (<https://www.eea.europa.eu/ims/total-greenhouse-gas-emission-trends>).

16. Interregeurope.eu. 2021. Commission launches the Fit for 55% Package. (<https://www.interregeurope.eu/news-and-events/news/commission-launches-the-fit-for-55-package>).

17. unsdsn.org. 2021. European Commission launches proposals to reach 55% emissions reduction by 2030. (<https://www.unsdsn.org/european-commission-launches-proposals-to-reach-55-emissions-reduction-by-2030>).

Figure 1. Total GHG emission trends and projections in Europe from 1990 to 2050¹⁸.



A contribution cap of 225 million tons from carbon removals is required to achieve net-zero emissions by 2050, which means that carbon removals, primarily from natural sinks, can be accounted for. The implication is that the EU's actual GHG reduction target is 52.8 per cent. With the carbon removals cap in place, the EU now effectively has separate goals for reducing emissions and removing carbon. In effect, any additional carbon reduction beyond this point can only be used to exceed the 55 per cent target. With this at hand, reaching a carbon sink of 310 million tons of CO₂ by 2030 could boost the EU's emissions reduction to 57 per cent¹⁹.

According to a European Environment Agency (EEA) report, the 2020 targets for GHG emissions reduction appear to be achievable, while renewable energy development appears to be just within reach. Simultaneously, meeting the energy efficiency target appeared to be becoming exceedingly challenging. The EU's goal of net zero by 2050 requires a realistic and resilient

18. EEA.eu. 2022. Total greenhouse gas emission trends and projections in Europe. (<https://www.eea.europa.eu/ims/total-greenhouse-gas-emission-trends>).

19. theicct.org. 2021. The European commission's fitness program for climate protection sluggards. (<https://theicct.org/blog/staff/european-commission-fitfor55-jul2021>).

emissions pathway into the future. Agreement and subsequent implementation of the EU's policy proposals addressing the EU's ambitious 2030 and 2050 targets (compared to 1990 and including removals) is therefore essential to slow the emissions trend and recover from the pandemic.

GHG emissions in the EU fell by 23.2 per cent in 2018 compared to 1990 levels, putting the EU on track to meet its 2020 target. Nonetheless, the EEA report revealed that current member state efforts were insufficient to meet the EU's 2030 targets. The current renewable energy target for the EU is at least 32 per cent.²⁰ To achieve the new target, member states will need to increase the national contributions outlined in their updated integrated NECPs in 2023 and 2024.

By 2030, the EU's total GHG emissions are expected to continue to decline continually, reaching a net emission reduction of 41 per cent²¹. Most member states have not yet aligned their ambitions with the new net reduction target of 55 per cent for 2030, and the further rollout of more effective policies and measures across Europe will be necessary to bring the new 2030 target within reach. To achieve its long-term goal of decarbonisation, the EU would need to meet its targets at an accelerating rate.

3.1.2. Key EU energy policies for net-zero emissions

- ***European Green Deal***

The EU's energy policy is now a component of the overarching European Green Deal, which was unveiled in December 2019, and will be a component of the Fit for 55 packages. European Green Deal is one of the pillars for clean energy transition, which will reduce GHG emissions and improve the quality of life for EU citizens by focusing on three key areas:

20. eea.europa.eu. 2018. Rising energy consumption slows EU progress on renewables and energy efficiency targets. (<https://www.eea.europa.eu/highlights/rising-energy-consumption-slows-eu>).

21. theicct.org. 2021. The European commission's fitness program for climate protection sluggards. (<https://theicct.org/blog/staff/european-commission-fitfor55-jul2021>).

- ensuring a secure and affordable EU energy supply,
- developing a fully integrated, interconnected, and digitalised EU energy market, and prioritising energy efficiency,
- improving the energy performance of buildings and developing a power sector that relies mostly on renewable energy.

Short-term investment financing is essential for achieving the Green Deal's objectives. Over the next decade, the European Green Deal Investment Plan or Sustainable Europe Investment Plan will mobilise one trillion euros for sustainable investments. It will assist public administrations and project promoters in identifying, structuring, and implementing sustainable projects.²²

- ***The EU Emissions Trading System (EU ETS)***

The EU Emissions Trading System (EU ETS) is a carbon pricing mechanism and the cornerstone of the EU's climate change policy. It is a crucial tool for cost-effectively reducing GHG emissions. It was established in 2005 and operates on a "cap and trade" basis. The total amount of certain greenhouse gases that can be emitted by the system's covered installations is capped. The cap is reduced over time in order to reduce total emissions. The ETS Directive (Directive 2003/87/EC) establishes the legal framework. The EU ETS is the first international emissions trading system and has inspired the development of emissions trading in other nations and regions. It encompasses over 11,000 installations, which account for roughly 40 per cent of total EU emissions, including power plants, industrial plants, district heating plants, and aviation. It establishes a price for carbon for covered emissions. Since 2005, emissions have decreased by 41 per cent due to the decarbonisation of the EU power sector. The measures taken to contain the COVID-19 pandemic resulted in a particularly significant reduction in annual emissions of 12 per cent in 2020.

22. europa.eu. 2022. Renewable energy targets. (https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-targets_en).

- **REPowerEU**

The Commission recently released the REPowerEU plan, which outlines a series of measures to rapidly reduce the EU's reliance on Russian fossil fuels well before 2030 by accelerating the transition to clean energy. REPowerEU is the European Commission's plan to make Europe independent from Russian fossil fuels well before 2030, in cognisance of Russia's invasion of Ukraine. Eighty-five per cent of Europeans believe that the EU should reduce its dependency on Russian gas and oil as soon as possible to support Ukraine.

There are three pillars that will solidify the REPowerEU plan: energy conservation, production of clean energy, and diversification of the EU's energy supply. As part of its expansion of renewable energy in power generation, industry, buildings, and transportation, the Commission proposes raising the directive's target to 45 per cent by 2030.²³ This would result in a total renewable energy generation capacity of 1,236 GW by 2030, as opposed to Fit for 55's projection of 1,067 GW²⁴.

Solar photovoltaics (PV) is one of the most rapidly deployed technologies, which plays a vital role in the EU's solar energy strategy and the introduction of the European Solar Rooftop Initiative, which is anchored by a legally binding EU solar rooftop obligation for certain categories of buildings. Furthermore, renewable hydrogen will be critical in replacing natural gas, coal, and oil in hard industries and transportation. By 2030, REPowerEU aims for 10 million tonnes of domestic renewable hydrogen production and 10 million tonnes of renewable hydrogen imports²⁵.

23. Europa.eu. 2022 REPowerEU: A plan to rapidly reduce dependence on Russian fossil fuels and fast forward the green transition. (https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131).

24. Europa.eu. 2022 REPowerEU: A plan to rapidly reduce dependence on Russian fossil fuels and fast forward the green transition. (https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131).

25. Europa.eu. 2022 REPowerEU: A plan to rapidly reduce dependence on Russian fossil fuels and fast forward the green transition. (https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131).

3.1.3. Current energy situation in the EU

The energy sector is accountable for more than 75 per cent of the EU's GHG emissions²⁶. Decarbonising the European Union's energy system is essential for achieving its 2030 climate goals and the EU's long-term strategy to achieve net-zero emissions by 2050. Increasing the proportion of renewable energy across all sectors of the economy is therefore a crucial element in achieving the EU's energy and climate goals of reducing GHG emissions from 40 per cent to at least 55 per cent compared to 1990 levels and becoming a climate-neutral continent by 2050. Almost 75 per cent of the EU's current energy system is based on fossil fuels. Oil and petroleum products dominate the EU's energy mix with a 34.5 per cent share, followed by natural gas (24 per cent) and coal (14 per cent). Renewable energy sources are gaining market share, but continue to play a minor role (14 per cent), as does nuclear energy (13 per cent)²⁷.

Coal, particularly lignite, is one of the most polluting fossil fuels used to generate electricity. Coal, on the other hand, accounts for less than a fifth of all electricity and heat generated in the EU, but accounts for half of all emissions from the electricity and heat sector.²⁸ Even though the 2018 reform of the EU ETS and subsequent increase in the CO₂ price reduced the economic viability of coal, phasing out coal will be necessary to reduce EU GHG emissions.

To meet the higher climate goals, coal must be phased out and the proportion of renewable energy must increase, thereby replacing fossil fuels and accelerating Europe's transition to clean energy. According to projections by the European Commission (EC), fossil fuels will continue to dominate half of the EU's energy mix in 2030. While coal, the most polluting element in the energy mix, must be drastically reduced by 2030, oil and natural gas can be phased out later to meet the climate goals. Between 2030 and 2050, most of the oil and natural gas-related changes are anticipated to occur.

26. bruegel.org. 2021. The geopolitics of the European Green Deal. (<https://www.bruegel.org/policy-brief/geopolitics-european-green-deal>).

27. bruegel.org. 2021. The geopolitics of the European Green Deal. (<https://www.bruegel.org/policy-brief/geopolitics-european-green-deal>).

28. econstor.eu. 2021. Decarbonisation of energy: Determining a robust mix of energy carriers for a carbon-neutral EU. (<https://www.econstor.eu/handle/10419/251795>).

In the past few decades, the use of coal (both lignite and hard coal) in the EU's energy sector has significantly decreased as a result of economic factors, emission-related laws, and national phase-out strategies. In particular, national policies specific to the coal sector play a part in the unambiguous phase-out of coal in EU member states. Nine of the twenty-seven member states have already stopped using coal, and eleven of the remaining member states will have shut down all their coal-fired power plants by 2030. Beyond 2030, Germany, Romania, Poland, and the Czech Republic expect a phase-out. On the other hand, Slovenia, Bulgaria, and Croatia have not yet chosen a timeline for the phase-out of coal.

Thus, significant investments in renewable energy power plants (photovoltaic solar power and wind power) are essential not only to phase out coal, but also to decarbonise the European electricity sector. This is especially true for countries that continue to rely on coal. According to Eurostat (2022)²⁹, the EU exceeded its 2020 renewable energy consumption target, obtaining 22 per cent of total gross final energy consumption from renewable sources.

3.2. ASEAN's Pathway to Net-Zero Emissions in the Energy Sector

3.2.1. ASEAN's net zero commitments

All ASEAN countries have signed the Paris Agreement, and nearly all have pledged net-zero emissions, which accounts for roughly 91 per cent of the region's carbon emissions³⁰. ASEAN member states comprise Brunei, Cambodia, Indonesia, Lao People's Democratic Republic (PDR), Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam. After COP 26, Brunei, Vietnam, Singapore, Myanmar, Malaysia, Lao PDR, and Cambodia have all pledged to achieve net-zero emissions by 2050. Indonesia and Thailand have set net-zero emissions targets for 2060 and 2065, respectively. Meanwhile

29. Eurostat. 2022. EU overachieves 2020 renewable energy target. (<https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20220119-1>).

30. accept.aseanenergy.org. ASEAN's Emerging Mission for a Low Carbon Energy Transition. (<https://accept.aseanenergy.org/aseans-emerging-mission-for-a-low-carbon-energy-transition/>).

the Philippines has established a 2030 and 2040 roadmap that includes 35 per cent and 50 per cent renewable energy (RE) in the power generation mix, respectively³¹. The descriptions of ASEAN countries' policies, targets, and wish lists for achieving net-zero emissions by 2050 and beyond are individual formulas that use many common but not similar elements, which are mixed in different quantities and timeframes to produce different versions of the same pathway.

Indonesia, the fourth-largest coal producer in the world, announced a halt to the construction of new coal-fired power plants beginning in the 2040s, which gained more international support. The government has established the goal of achieving net-zero emissions and a fully decarbonised power sector by 2060 or earlier³². The country aims to increase the share of renewable energy to 23 per cent by 2025. The Minister of Energy and Mineral Resources announced the possibility of retiring 9.2 GW of coal power plants by the 2030s, of which 5.5 GW will be retired early and 40 per cent, or approximately 3.7 GW, will be phased out and replaced with renewables. However, 60 per cent of the nation's electricity comes from coal presently³³. According to one study, Indonesia must reduce coal power generation by 11 per cent over the next eight years and then accelerate retirement by over 90 per cent by 2040 in order to retire the country's 72 coal-fired power plants by 2045 with international financial support³⁴.

The draft Power Development Plan 8 (PDP8) for the years 2021-2030, with a 2045 vision, is currently being finalised in Vietnam. The draft PDP8 also includes plans for significant capacity additions. PDP8 is expected to

31. energytransitionpartnership.org. 2022. Energy transition dialogue 2022 – ASEAN outlook for zero carbon energy. (<https://www.energytransitionpartnership.org/resource/asean-outlook-for-zero-carbon-energy/>).

32. Anita Nugraha. 16 September 2022. Indonesia to allow new coal-fired power plants under specific conditions. (<https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/energy-transition/091622-indonesia-to-allow-new-coal-fired-power-plants-under-specific-conditions>).

33. Fransiska Nangoy. 2 September 2022. IEA says Indonesia policy reform needed for clean energy transition. (<https://www.reuters.com/business/energy/iea-says-indonesia-policy-reform-needed-clean-energy-transition-2022-09-01/>).

34. cgs.umd.edu. 2022. First-ever just transition plan for coal retirement in Indonesia finds a feasible pathway for a 2045 phase-out. (<https://cgs.umd.edu/news/first-ever-just-transition-plan-coal-retirement-indonesia-finds-feasible-pathway-2045-phase>).

contain 19-20 GW of solar energy and 18-19 GW of wind energy. However, fossil fuels will continue to be the backbone of the power sector until 2030, with 22 GW of gas and 37 GW of coal-fired capacity³⁵.

Thailand intends to increase the share of renewable energy in the energy mix to 50 per cent by 2050 in order to meet climate pledges. Thailand's Ministry of Energy announced plans to increase renewable energy to 50 per cent of total energy consumption by 2050, with the goal of reaching carbon neutrality and net-zero GHG emissions by 2050 and 2065, respectively³⁶. Thailand's power fuel mix will evolve to include more Laos imports, with the power purchase agreement (PPA) increasing from 9 GW to 10.5 GW, and advanced clean technologies such as hybrid projects combining hydro, floating solar and storage, and carbon capture and storage (CCS) systems³⁷.

Cambodia plans to introduce 1,815 MW of solar energy into its national grid by 2030³⁸. By 2025, Malaysia aims to achieve a 31 per cent share of RE in the national installed capacity mix. This goal supports Malaysia's global climate commitment to reduce its economy-wide carbon intensity (as a percentage of gross domestic product) by 45 per cent between 2005 and 2030³⁹.

The Philippines has pledged to achieve 50 per cent renewables in its power generation mix by 2040, focusing on geothermal energy, in which 100 per cent foreign investment is now allowed⁴⁰. In addition, the Lao PDR has committed to unconditionally reducing GHG emissions by 60 per cent by

35. aseanenergy.org. 2022. ASEAN Energy in 2022: Outlook Report. (<https://aseanenergy.org/asean-energy-in-2022/>).

36. EPP0.go.th. 2022. National Energy Plan (NEP). (<http://www.eppo.go.th/index.php/en/component/k2/item/17093-nep>).

37. EPP0.go.th. 2022. National Energy Plan (NEP). (<http://www.eppo.go.th/index.php/en/component/k2/item/17093-nep>).

38. energytracker.asia. 2022. Renewable Energy in Cambodia - Opportunities and Challenges. (<https://energytracker.asia/renewable-energy-in-cambodia-opportunities-and-challenges/>).

39. Seda.gov. 2021. Malaysia Renewable Energy Roadmap. (https://www.seda.gov.my/reportal/wp-content/uploads/2021/12/MyRER_webVer-1.pdf).

40. Supapo, Khriydel Rhea M., Lorafe Lozano, Ian Dominic F. Tabañag, and Edward M. Querikiol. 2022. A Backcasting Analysis toward a 100% Renewable Energy Transition by 2040 for Off-Grid Islands. *Energies*. (<https://doi.org/10.3390/en15134794>).

2030 compared to the business-as-usual scenario, and Cambodia submitted an official 2030 emissions reduction scenario last year⁴¹.

Singapore Green Plan 2030 states that the city-state met its 2020 solar deployment target of 350 megawatt-peak (MWp) in Q1 2020, with a goal of 2 gigatonne-peak (GWp) by 2030. With Singapore's clean energy vision, in order to develop a masterplan for clean and green estates, the national industrial developer has implemented two clean energy programmes, Solar-Roof and SolarLand. Furthermore, Singapore plans to import 30 per cent of its electricity from low-carbon sources by 2035 as part of ongoing efforts to decarbonise the power sector⁴².

Malaysia has set a target to reach 31 per cent of RE share in the national installed capacity mix by 2025 and a ramp up to 40 per cent by including large hydroelectric power plants⁴³.

Under the Paris Agreement, the ASEAN member states have committed to reducing their GHG emissions. Their Nationally Determined Contributions (NDCs) include strategies to increase their capacity for renewable energy. Table 1 summarises the net zero and renewable energy targets in each ASEAN member state.

41. TheASEANpost.com. 2021. COP26: ASEAN's Commitment In The Energy Sector. (<https://theaseanpost.com/article/cop26-aseans-commitment-energy-sector>).

42. Greenplan.gov. 2022. Singapore Green Plan 2030. (<https://www.greenplan.gov.sg/>).

43. Seda.gov. 2021. Malaysia Renewable Energy Roadmap. (https://www.seda.gov.my/reportal/wp-content/uploads/2021/12/MyRER_webVer-1.pdf).

Table 1. ASEAN countries pledge for net zero.^{44, 45, 46, 47}

| Country | Net zero Target | RE in the energy target |
|-------------|-----------------|---|
| Brunei | 2050 | 30 per cent share of renewable energy in power generation mix by 2035 |
| Vietnam | 2050 | 32 per cent of power generation from renewable sources by 2030 and 43 per cent by 2050 |
| Singapore | 2050 | has reached its target of 350 MWp solar production (its 2020 green energy agenda goal), 2 GW by 2030 |
| Myanmar | 2050 | By 2025, 12 per cent of all electricity generated in Myanmar will be renewable |
| Malaysia | 2050 | 31 per cent of total power capacity from renewable energy by 2025, 40 per cent in 2035, including large hydro plants |
| Lao PDR | 2050 | 30 per cent share of renewable energy in the total energy consumption by 2025 |
| Cambodia | 2050 | 20 per cent share of solar power of installed power capacity by 2023, and 1,815 MW of solar energy in its national grid by 2030 |
| Indonesia | 2060 | 23 per cent share of renewable energy in national energy source by 2025 |
| Thailand | 2065 | 50 per cent share of renewable energy in new power generation by 2050 |
| Philippines | - | 35 per cent renewable energy generation by 2030 and 50 per cent by 2040 |

44. EU-ASEAN.eu. 2022. Powering ASEAN's Energy Transition. (<https://www.eu-asean.eu/wp-content/uploads/2022/02/Powering-ASEANs-Energy-Transition-2021.pdf>).

45. GreenDKinSEA.com. 2022. Singapore Plans to Import 30% of Energy from Low-carbon Sources by 2035. (<https://www.greendkinsea.com/post/singapore-plans-to-import-30-of-energy-from-low-carbon-sources-by-2035>).

46. EnergyTrackerAsia. 2022. Renewable Energy in Singapore: Sources, Plan and Strategy. (<https://energytracker.asia/renewable-energy-singapore/#:~:text=Singapore%20has%20reached%20its%20target,targeting%20%20GW%20by%202030>).

47. Moni Narayan. 25 October 2021. Reuters. Renewables to Make up 30% of Brunei's Power Generation by 2035 –minister. (<https://www.reuters.com/world/asia-pacific/renewables-make-up-30-bruneis-power-generation-by-2035-minister-2021-10-25/>).

3.2.2. ASEAN's power sector and the need of energy transition

ASEAN's role in the global fight to decarbonise is expanding. The average annual growth rate for ASEAN electricity demand between 2008 and 2018 was 6.3 per cent, mostly due to strong economic expansion and urbanisation. The region's GHG emissions have increased as a result of industrialisation based on fossil fuels and accompanying land use change, resulting in the loss of tropical forests and peatlands rich in biodiversity. Five countries account for approximately 90 per cent of the ASEAN region's total GHG emissions: Indonesia, Malaysia, the Philippines, Thailand, and Vietnam.

Given the current policies and NDC targets, global GHG emissions will continue to rise through 2030, resulting in a temperature rise of 2.1-3.9°C above pre-industrial levels by 2100. According to the ASEAN Centre for Energy (ACE) (2021), the region's energy-related GHG emissions will rise by 34-147 per cent between 2017 and 2040. By the end of the twenty-first century, it is mandatory for the ASEAN region to achieve net-zero emissions, paving the way for a "decarbonising revolution". The power sector is expected to play a critical role in the era of energy transition. According to the ASEAN Power Updates in 2021, the ten ASEAN member states (AMS) installed approximately 285 GW of power capacity, with approximately 22 GW added in 2020 alone⁴⁸.

Coal and gas contributed approximately 31.4 per cent and 30.9 per cent respectively, while oil contributed approximately 4.2 per cent. Hydro became the largest RE category, accounting for nearly 21 per cent of the power capacity mix, followed by geothermal, solar, wind, bioenergy, and other RE sources accounting for a total of 12.5 per cent.⁴⁹ ASEAN aims for a 23 per cent renewable energy share of total primary energy supply and a 35 per cent renewable energy share of installed power capacity by 2025, and the most recent official data indicates that 33.5 per cent of the region's 285 GW capacity was powered by renewables in 2020.

48. ASEANenergy.org. 2021. ASEAN Centre for Energy. ASEAN Power Updates 2021. (<https://aseanenergy.org/asean-power-updates-2021/>).

49. ASEANenergy.org. 2022. ASEAN Centre for Energy. ASEAN Energy in 2022: Outlook Report. (<https://aseanenergy.org/asean-energy-in-2022/>).

In 2020, the region's GHG emissions reached 668 million tons of CO₂e. Natural gas accounted for 26 per cent of the carbon emissions, while oil accounted for 2 per cent. Indonesia is responsible for 32.2 per cent of all ASEAN GHG emissions, followed by Vietnam at 18.8 per cent, Malaysia at 16.7 per cent, Thailand at 14 per cent, and the Philippines at 10.5 per cent. Brunei was the smallest contributor to ASEAN power-sector emissions in 2020, accounting for 0.4 per cent of the total.⁵⁰

Southeast Asia's renewable energy resources are abundant. However, they are currently underutilised. Land-based utility-scale wind and solar photovoltaic energy development have enormous potential in the ASEAN member states⁵¹. The total technical potential for solar PV and wind power in Southeast Asia is 29,967 GW-peak (GWp) and 1,382 GWp, respectively. Notably, potential solar PV capacity exceeds 41 TW (or 59,386 TWh annually), with levelised cost of energy (LCOE) ranging from US\$64/MWh to US\$246/MWh throughout the region. In addition to solar and wind potentials, all ASEAN member states besides Singapore have access to hydropower resources. Biomass potential is also present in eight Southeast Asian nations, Indonesia being the most prominent⁵².

While there is an urgent need to reduce carbon emissions, fossil fuels are expected to account for 86.4 per cent of ASEAN's total energy mix in 2025 due to the rising of energy demand. Furthermore, renewable energy is facing challenges. Solar and wind generate energy intermittently due to varying environmental conditions, necessitating the use of energy storage systems. ASEAN's power grids must also be significantly upgraded in order to incorporate renewable energy.

50. Handayani, Kamia, Pinto Anugrah, Fadjat Goembira, Indra Overland, Beni Suryadi, and Akbar Swandaru. 2022. "Moving beyond the NDCs: ASEAN pathways to a net-zero emissions power sector in 2050. *Applied Energy*. (<https://doi.org/10.1016/j.apenergy.2022.118580>).

51. NREL.gov. 2019. Exploring renewable energy opportunities in select Southeast Asian countries: A geospatial analysis of the levelized cost of energy of utility-scale wind and solar photovoltaics (No. NREL/TP-7A40-71814). (<https://www.nrel.gov/docs/fy19osti/71814.pdf>).

52. NREL.gov. 2019. Exploring renewable energy opportunities in select Southeast Asian countries: A geospatial analysis of the levelized cost of energy of utility-scale wind and solar photovoltaics (No. NREL/TP-7A40-71814). (<https://www.nrel.gov/docs/fy19osti/71814.pdf>).

4. ANALYSIS OF ENERGY TRANSITION POLICY OPTIONS IN THE EU AND ASEAN

The EU's goal of achieving net-zero carbon emissions by 2050 faces formidable obstacles. The political commitment and will of member states is among the most significant obstacles to a successful energy transition. Notwithstanding this, the Green Deal's pledges to reduce carbon emissions are realisable but achieving them will be a difficult task. The pace and outcomes of the energy transition in the EU will vary by country. Twenty-one member states consider themselves leaders in the transition to renewable energy, while only six believe they are lagging behind. Regarding some pressing and compounding issues at hand, member states have diverging opinions on issues such as the proposed carbon border adjustment mechanism, the role of nuclear energy in Europe's future energy mix, bridging technologies in the transition to net zero, and the socioeconomic implications of closing carbon-intensive industries⁵³.

Second, recent disruptive events such as extremely high energy prices and the regional conflict between Ukraine and Russia is creating momentum for massive energy transition investments. The European Commission and member states are currently attempting to significantly reduce gas, oil, and coal imports' dependence on Russia. Russia supplied the EU with approximately 40 per cent of its fossil fuel gas, 27 per cent of its oil imports, and 46 per cent of its coal imports⁵⁴. Replacing natural gas alternative supplies poses a significant challenge. Ideally, clean energy technologies can deliver reductions of up to two-thirds by 2025.

In order to achieve net-zero emissions by 2050 and reduce carbon emissions by 55 per cent from 1990 levels, the EU must deploy clean energy technologies such as abundant renewable energy (especially solar and wind), enhance energy efficiency, increase electrification of large portions of the building and transportation sectors, and replace fossil fuels in sectors that are difficult to electrify more quickly and in greater quantities. The develop-

53. ecf.eu. 2021. Europe's green moment: How to meet the climate challenge. (<https://ecfr.eu/publication/europes-green-moment-how-to-meet-the-climate-challenge/>).

54. bruegel.org. 2021. The geopolitics of the European Green Deal. (<https://www.bruegel.org/policy-brief/geopolitics-european-green-deal>).

ment of a renewable energy system will also necessitate the reinforcement and expansion of parallel grids, as well as the capacity to accommodate fluctuating electricity supplies. In addition to the commercialisation of hydrogen power plants and battery storage, increased storage capacity will be required. However, this may raise the issue of sector coupling between various energy markets. Investors will need clarification on how the European energy market's design will ensure the profitability of investments through addressing the described challenge.

In ASEAN, similarly, energy transition is critical, but it faces a number of challenges. Current ASEAN investment levels in renewable energy and energy efficiency projects are insufficient to achieve net-zero emissions. Access to finance for renewable energy projects is more difficult in comparison with other large-scale investments. The main barriers to financing for renewable energy projects are a lack of long-term and sustainable financing, the involvement of various risks, and a lack of capacity among market participants. Some ASEAN member states currently have inadequate experience and expertise in assessing the risks of renewable energy investments.

To achieve the ASEAN goal of 23 per cent renewable energy in its total primary energy supply by 2025, green financing is required to provide the initial capital needed to develop large renewable energy infrastructure projects in ASEAN. Despite an estimated \$3 trillion in green finance opportunities for ASEAN between 2016 and 2030, the total green loans and bonds issued in ASEAN from 2013 to 2019 amounted to \$13.4 billion. This represents only 0.45 per cent of the region's green finance opportunities. The Asian Development Bank (ADB) estimates that investments totalling \$290 billion will be necessary to meet regional renewable energy goals⁵⁵. However, a \$1 million investment in renewable energy and energy efficiency can create 7.5-7.7 full-time jobs. This is considerably more than the 2.7 jobs created by investments in fossil fuels at the same level⁵⁶. In addition, for developing nations to successfully scale up renewable energy, it is evident that private sector investments must take the lead.

55. ADB.org. 2021. Financing Clean Energy in Developing Asia. (<https://www.adb.org/sites/default/files/publication/706641/financing-clean-energy-developing-asia.pdf>).

56. ADB.org. 2021. A green economic reset will deliver an inclusive, lasting recovery for Asia and the Pacific. (<https://www.adb.org/news/features/green-economic-reset-will-deliver-inclusive-lasting-recovery-asia-and-pacific>).

Moreover, the current frameworks for power purchase agreements (PPAs) in most ASEAN member states do not incentivise investment in power projects powered by renewable energy sources and most of these contracts are long-term in nature. This is attributed to government-controlled entities overseeing and regulating the respective power markets, such as Indonesia's PLN, Malaysia's Tenaga Nasional, and Thailand's EGAT, which negotiate power purchase agreements with independent power producers (IPPs). Therefore, policymakers must evaluate and adopt more competitive and sustainable power purchase agreements that encourage investments in economically viable renewable energy projects in ASEAN.

The expansion of wind and solar energy presents challenges for system integration. Power grids are essential for the transmission of renewable energy to homes and businesses. It is critical that ASEAN member states ensure that their power grids can accommodate the increased demand and intermittent electricity generation from renewable sources. Therefore, cross-border interconnection is a crucial resource for flexibility that will enable the effective utilisation of renewable energy. Ten member states are currently working to implement the ASEAN power grid to facilitate power trade. Enhanced ASEAN power grid integration could prevent the addition of 154 MW of capacity by 2025, saving \$1.87 billion, according to the ASEAN Centre for Energy.

However, it has been argued that the equitable distribution of GHG emissions reduction burdens among nations is a complex aspect of international cooperation negotiations⁵⁷. The EU is, alongside China and the United States, one of the world's three largest CO₂ emitters. Even these three largest emitters are at the forefront, having pledged to limit global warming to 2°C. The question remains as to whether they need to do more than the rest of the world⁵⁸. Over the last two decades, various allocating mechanisms have been proposed, ranging from those that maintain the status quo, such as grandfathering rules, constant emissions ratios, and so on, to those based on equality, ability to pay, or responsibility for historical emissions. Recently, a greater

57. Metz, Bert. 2000. International equity in climate change policy. Integrated assessment. (<https://doi.org/10.1023/A:1019171513507>).

58. Jonathan Trinastic. 29 October 2015. Equity or Inertia: How Emissions Sharing Philosophies Shape Climate Policy Success. (https://www.nature.com/scitable/blog/eyes-on-environment/emission_pledges_from_us_eu/).

emphasis has been placed on distributions of a global carbon budget (GCB), allowing flexibility at the national level to determine the emission pathways that are compatible with a given budget. One study compared global climate policies for permits for global CO₂ emissions from 2000 to 2100 across six regions, including the United States, Japan, the European Union, China, the former Union of Soviet Socialist Republics, and the rest of the world (ROW), using four equity principles, namely, the ability to pay, egalitarianism, grandfathering, and historical responsibility.

The results indicated that the grandfathering principle is more beneficial for developed nations, whereas the historical responsibility principle is more advantageous for developing nations.⁵⁹ However, there is currently no consensus on the best definition of international equity for climate change mitigation. In assessing the future progress of the Paris Agreement, it must consider all these factors, which undoubtedly offer intriguing insights for future research and methodological improvements.

5. CONCLUSION: THE DEVELOPMENT OF ASEAN ENERGY COOPERATION

Both the EU and ASEAN view the potential for cooperation in the development and adoption of renewable energies towards energy transition as highly promising and integral to achieving climate goals. The decarbonisation of the ASEAN energy sector will play a significant role in the fight against climate change and the greening of the economy. The EU and ASEAN share a few similarities, but they also have significant differences that moderate integration and cooperation in any field, including energy policy. ASEAN is an intergovernmental organisation, while the EU is a supranational organisation with a legislature, a legislative authority, and powerful quasi-executive bodies in the form of the EU Commission and the Council of the EU. This ability to legislate has produced EU directives and policies on integration, renewables, and energy efficiency, which have set the EU on the path to decarbonisation.

59. Mi, Zhifu, Hua Liao, D'Maris Coffman, and Yi-Ming Wei. 2018. Assessment of equity principles for international climate policy based on an integrated assessment model. *Natural Hazards* 95. (<https://link.springer.com/article/10.1007/s11069-018-3408-7>).

In addition, the EU has had carbon pricing via the EU ETS since 2005. Prior to 2019, when Singapore implemented a \$4/tCO₂e low-carbon tax, ASEAN had no existing coordinated approach to carbon pricing. Carbon pricing is one of the mechanisms that can mobilise the necessary financial investments to stimulate clean technology development and market innovation in order to stimulate investments in low-carbon infrastructure and technology.

In order to assist ASEAN in overcoming the challenges it faces in its energy transition, Energy Transition Mechanism (ETM) and de-risking Green Investments are proposed as solutions. ETM is a method of combining public and private financing to accelerate the retirement of coal-fired power plants while significantly increasing investments in renewables. While green project de-risking is critical to ASEAN's energy transition success, increasing the use of financial de-risking instruments, such as insurance for renewable energy projects, decommissioning of legacy carbon-intensive fossil fuel electric plants projects, and public equity co-investments, will further boost the risk-reward profile of private investors.

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05

Carbon Border Adjustment Mechanism (CBAM)

Implications for ASEAN-EU
Relations

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Abstract

There is a growing policy trend that in addressing climate change, various trade measures must be implemented to enhance the sustainable practices of global stakeholders. As a response, to level the playing field for global trade partners in enhancing sustainability, the European Union (EU) recently introduced the European Union Carbon Border Adjustment Mechanism (CBAM), which will impose a carbon price on certain imports, namely electricity, aluminum, cement, iron and steel, and fertilizer, to the EU. The EU CBAM may cause trade disputes with World Trade Organisation (WTO) members. As the EU and ASEAN's current trade relations are on an upswing trajectory, there are some risks involved in implementing the EU CBAM in the ASEAN region. Despite the perceived adverse effects, there is still room for improvement in communicating EU CBAM implementation in ASEAN. The EU should introduce more calibrated approaches to implementing the EU CBAM in ASEAN, particularly considering the political and strategic risks, economic development levels and capacities, and state of climate ambitions of individual ASEAN countries.

INTRODUCTION

According to the international agendas of the United Nations Sustainable Development Goal 13 on climate actions, the 2015 Paris Agreement and COP26 in 2021 to COP27 in November 2022, climate change solutions need to be scaled up in various aspects, including the critical issue of international trade.

The European Union (EU) and the Association of Southeast Asian Nations (ASEAN) are the two most successful regional blocs. Trade relations between the two sides are currently on an upswing trajectory. However, the EU's current plan to impose a Carbon Border Adjustment Mechanism (CBAM) as part of the European Green Deal will likely cause disputes with global partners, including ASEAN.

This paper aims to analyse the EU CBAM and its technical implementation and, most importantly, the possible implications of the EU CBAM to ASEAN-EU strategic relations. Through literature reviews and interviews with expert partners, this paper attempts to capture the regional perceptions and possible calibrated scenarios of implementing the EU CBAM in the ASEAN region.

Section 1 explains the rationale of the EU CBAM and its technical aspects. This section provides the nuanced perspectives of those who support and those who disapprove of the implementation of the EU CBAM, so as to give readers a more balanced view. Section 2 looks closely at the strategic implications of the EU CBAM to ASEAN-EU relations and discusses ASEAN's receptiveness to such a policy. Section 3 concludes with possible future scenarios to be explored by the EU and ASEAN to adapt to the EU CBAM.

SECTION 1: ABOUT THE EU CBAM

What is the EU CBAM?

As part of its flagship Green Deal policy launched in 2021, the European Union introduced a Carbon Border Adjustment Mechanism (CBAM). If it fully

takes off, the EU CBAM will impose a carbon price on certain imports, namely electricity, aluminum, cement, iron and steel, and fertilizer, to the EU region.¹

The CBAM aims to strengthen global climate change actions. The objective of the EU CBAM is much aligned with the EU's current unwavering commitment to the UN Paris Agreement on climate change. Under the Paris Pledge, countries worldwide are fully committed to limiting global warming to well below 2 degrees Celsius and preferably to 1.5 degrees Celsius. By imposing the CBAM, the EU aims to address inconsistencies in the climate ambitions of countries around the world and to extend the geographical reach of its carbon price to reflect the carbon content of imports accurately. By doing so, the EU also hopes to prevent companies from relocating their activities to countries with less carbon emission tariffs or taxes.

From a fairness perspective, such a measure will ensure healthy competition between inshore and offshore companies. Companies in the EU must pay a high price for carbon emissions. Under the EU Emissions Trading System (ETS), the price per ton of CO₂ emitted reached €69 (US\$75) in 2021, which makes carbon prices in the EU one of the highest in the world.² According to the World Bank Carbon Pricing Dashboard, major economies in Asia are still trailing behind that number. Under their national ETS, China, Korea, and Japan only imposed a carbon tax of US\$9.20, US\$18.75, and US\$2.30 per ton of CO₂ emitted, respectively.³ The EU thus imposes a carbon price on companies or exporters from countries with low carbon prices in order to level up the playing field.

1. European Commission. 14 July 2021. Carbon Border Adjustment Mechanism, Text. European Commission - European Commission (blog). (https://ec.europa.eu/commission/presscorner/detail/en/qanda_21_3661).

2. Tim Schauenberg. 12 July 2021. CO₂ Tax at EU Border: Revolution or Protectionism? – DW – 12/07/2021. Dw.Com. (<https://www.dw.com/en/carbon-border-tax-co2-eu-europe-global-south/a-59987093>).

3. World Bank. Carbon Pricing Dashboard | Up-to-Date Overview of Carbon Pricing Initiatives. Accessed 31 October 2022. (https://carbonpricingdashboard.worldbank.org/map_data).

How Does the EU CBAM Work?

When the EU CBAM is fully implemented, importers of foreign goods covered under the industry scope must buy carbon certificates corresponding to the carbon price that would have been paid, assuming the goods had been produced under the EU's carbon pricing rules. Alternatively, if a non-EU producer can show that they have already paid the price for the carbon used in the production of the imported goods, EU importers are allowed to claim a corresponding reduction.⁴

The initial phase of the EU CBAM will apply to imports of electricity, cement, aluminum, fertilizer, and iron and steel products. Under the current plans, the EU CBAM is planned to be fully implemented in 2026 following a transitional phase over 2023-25. During the transitional phase, EU importers will have to comply with reporting requirements but are not required to purchase and surrender CBAM certificates.⁵ However, positions on the CBAM implementation remain unclear. Some countries in the EU are calling for faster implementation of the full mechanism from 2025 onwards while others are calling for the expansion of the scope to cover more sectors and emissions from the same date.⁶

The EU CBAM is a key priority of the French Presidency of the Council of the European Union in 2022. The French Presidency has been mobilising resources to align the EU CBAM with the World Trade Organisation's (WTO's) standards and the multilateral climate framework.⁷ The Council has agreed that the new registry of CBAM declarants (importers) will be centralised at the EU level. Recently, the Council also mandated the establishment of

4. European Commission. Carbon Border Adjustment Mechanism.

5. Graham Stuart et al. 23 August 2021. EU: European Commission Adopts Proposal for New Carbon Border Adjustment Mechanism. Global Compliance News. (<https://www.globalcompliancencews.com/2021/08/23/eu-european-commission-adopts-proposal-for-new-carbon-border-adjustment-mechanism10082021/>).

6. Victoria Hatherick. 8 December 2021. Doubts Persist on Suitability of EU CBAM | Argus Media. (<https://www.argusmedia.com/en/news/2281231-doubts-persist-on-suitability-of-eu-cbam>).

7. European Council of the EU. 15 March 2022. Council Agrees on the Carbon Border Adjustment Mechanism (CBAM). (<https://www.consilium.europa.eu/en/press/press-releases/2022/03/15/carbon-border-adjustment-mechanism-cbam-council-agrees-its-negotiating-mandate/>).

a minimum threshold for exemption from the CBAM obligations: consignments with a value less than €150.⁸

Is the EU CBAM Promising?

The EU CBAM has received much criticism worldwide. Chief among them is the economic risks to developing countries' exports. However, a study from the United Nations Conference on Trade and Development (UNCTAD) indicates that the impacts would be minuscule. Developing countries will potentially see only a reduction of 1.4 per cent of exports across the total of the targeted carbon-intensive sectors if the EU CBAM is implemented with a price of US\$44 per ton of embedded CO₂ emissions, and a 2.4 per cent reduction if it is implemented with a US\$88 per ton price.⁹

The UNCTAD study also points out that while the EU CBAM was intended to reduce carbon leakage and to level the playing field of trade partners so as to increase their climate ambitions, the impact on mitigating global carbon emissions is relatively minuscule. The EU CBAM will only help to cut 0.1 per cent of global CO₂ emissions if it is fully implemented.¹⁰ Moreover, justifying the EU CBAM from the climate rationale might be challenging, because the EU and most of its least-developed trading partners are the signatories of the United Nations Framework Convention on Climate Change (UNFCCC). At the Earth Summit in Rio de Janeiro in 1992, all UNFCCC signatories had pledged to respect the principle of Common but Differentiated Responsibilities (CBDR)¹¹, which acknowledges individual countries' different and differing responsibilities in addressing climate change based on their respective capacities. Imposing a CBAM on least-developed countries might be perceived as violating the CBDR principle under the UNFCCC.

8. European Council of the EU.

9. UNCTAD. 2021. A European Union Carbon Border Adjustment Mechanism: Implications for Developing Countries. (https://unctad.org/system/files/official-document/osginf2021d2_en.pdf).

10. UNCTAD.

11. United Nations Climate Change. Introduction to Climate Finance | UNFCCC. Accessed 31 October 2022. (<https://unfccc.int/topics/climate-finance/the-big-picture/introduction-to-climate-finance/introduction-to-climate-finance>).

Second, there is a concern that the EU CBAM could also exacerbate income and welfare distribution inequalities between rich and poor economies as it can become a major non-tariff barrier. The EU could potentially favour goods produced in developed countries because they utilise less carbon-intensive production processes. Developed countries are also relatively advanced in pursuing carbon tax measures in their own jurisdictions; hence, it is technically easier for producers in developed countries to integrate with the EU CBAM. In this case, the EU CBAM implementation may be departing from the WTO's Most-Favoured-Nation (MFN) principle¹² where countries cannot normally discriminate between their trading partners because it could give preference to those trading partners who have robust emissions trading mechanisms. A study from the Task Force on Climate, Development and the International Monetary Fund (IMF) argues that at its broadest implementation, the EU CBAM could result in an annual welfare gain in developed countries of US\$141 billion while developing countries could see an annual welfare loss of US\$106 billion.¹³

It should be noted, though, that the World Trade Organisation is the governing body of trade. The WTO has upheld the principle of trade liberalisation since the foundation of GATT amid the increasing need to ramp up sustainability practices in the global supply chain. The WTO shall stage the discussions and facilitate the exchange of views on trade and the environment, including the EU CBAM. The WTO seems to support pushing for the global carbon pricing agreement and, simultaneously, the liberalisation of goods and services. But the devil is in the details. The WTO must balance emissions trading systems, trade fairness, and other policy measures.

Third, the technical challenges of the EU CBAM are unavoidable. A policy report from Bruegel points out that implementing the EU CBAM will be potentially costly, as drawing the distinction between targeted and non-targeted products is exceptionally challenging because the supply chain of goods

12. World Trade Organization. WTO | Understanding the WTO - Principles of the Trading System. Accessed 31 October 2022. (https://www.wto.org/english/thewto_e/whatis_e/tif_e/fact2_e.htm).

13. Xiaobei He, Zhai Fan, and Jun Ma. March 2022. The Global Impact of a Carbon Border Adjustment Mechanism, A Quantitative Assessment. Task Force on Climate, Development and the International Monetary Fund. (<https://www.bu.edu/gdp/files/2022/03/TF-WP-001-FIN.pdf>).

production has now become highly complex and carbon pricing mechanisms across the world vary a lot. Exporters can, to some extent, re-route their products from countries that levy carbon tariffs to unregulated markets.¹⁴ For instance, an aluminum producer in India might stop exporting to the EU due to the EU CBAM, but it can re-route the aluminum to the United States. A company based in the US that may be somewhat already integrated with the EU Emissions Trading System (ETS) can help re-sell it to the EU. Hence, to ensure that the EU CBAM entirely takes off, it requires more robust rules of origin (ROO) in trade agreements.¹⁵

Fourth, implementing the EU CBAM is politically costly for the EU. The EU must deal with the strategic and political implications of the EU CBAM on its trading partners or in various multilateral trade fora. The political repercussions might not be direct but can have long-term implications. For instance, least-developed countries that see that the EU CBAM would negatively affect their exports would likely hedge by seeking other trade partners, reducing their exports to the EU, and re-routing their exports to the least-carbon-regulated countries, which will ultimately encourage decoupling from the EU. There is already a deep trade divide between major global blocs, such as the United States (US) versus China; developing versus developed countries; and Asian versus Western countries. There is a considerable risk that the EU CBAM will further fragmentise these major global trade blocs. Despite the aforementioned risks, there are still some opportunities for the EU to promote and communicate the EU CBAM better, especially in the ASEAN region, one of its largest trading partners.

14. Georg Zachmann and Ben McWilliams. March 2022. A European Carbon Border Tax: Much Pain, Little Gain. Bruegel. (<https://www.bruegel.org/sites/default/files/wp-content/uploads/2020/03/PC-05-2020-050320v2.pdf>).

15. Melinda Martinus and Jiahui Qiu. 2021. Trade and Environmental Disputes May Persist Despite Promising Leaders' Summit on Climate. ISEAS Perspective 81, no. 2021 (23 June 2021). (<https://www.iseas.edu.sg/articles-commentaries/iseas-perspective/2021-85-trade-and-environmental-disputes-may-persist-despite-promising-leaders-summit-on-climate-by-melinda-martinus-and-qiu-jiahui/>).

SECTION 2: EU CBAM IMPLICATIONS TO ASEAN-EU RELATIONS

EU CBAM Impacts in ASEAN

As the year 2022 marked the 45th anniversary of ASEAN-EU relations and the forthcoming launch of the ASEAN EU Strategic Partnership (2023-2027), the EU has the opportunity to introduce and promote the EU CBAM in ASEAN in more calibrated ways.

Currently, the EU is ASEAN's third largest trading partner after China and the United States, accounting for around 10.6 per cent of the total ASEAN trade.¹⁶ Meanwhile, all ten ASEAN member states collectively constitute the EU's third largest trading partner outside Europe (after China and the US) with more than €215.9 billion of trade in goods in 2021.¹⁷

Despite its high dependency on trade, ASEAN's response to the EU CBAM has been generally muted because the impact would be insignificant.¹⁸ According to a study by the Policy Center for the New South, Russia, Turkey, and China are the top three most impacted countries in terms of the aggregated value of exports of exposed sectors. Other major Asian economies such as the Republic of Korea and India are among the top ten affected countries. Meanwhile, among ASEAN countries, only Malaysia and Indonesia would probably be affected due to the considerable value of their exports of iron and steel and aluminum to the EU. But, the overall impact would be quite minuscule.¹⁹

16. European Commission. EU Trade Relations with Association of South East Asian Nations (ASEAN). Accessed 31 October 2022. (https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/association-south-east-asian-nations-asean_en).

17. European Commission.

18. Mirza Sadaqat Huda. 19 August 2022. The Implications of EU's CBAM for Southeast Asia. FULCRUM (blog). (<https://fulcrum.sg/the-implications-of-eus-cbam-for-southeast-asia/>).

19. Rim Berahab. January 2022. Is the EU's Carbon Border Adjustment Mechanism a Threat for Developing Countries? Policy Center for the New South. (<https://www.policycenter.ma/opinion/eus-carbon-border-adjustment-mechanism-threat-developing-countries>).

Nevertheless, EU policymakers must see a larger optic of implementing the CBAM on ASEAN countries, especially since the EU is increasingly seen as unilateralist in protecting its interests in the international scene, such as on climate mitigation and human rights protection issues.²⁰ A study by the Konrad Adenauer Foundation titled *Perception of the Planned EU Carbon Border Adjustment Mechanism in the Asia Pacific – An Expert Survey* suggests that although the EU CBAM will not apply to palm oil, one of the largest export commodities of Indonesia, due to the ongoing conflict with the EU over palm oil exports, most policymakers in Jakarta would probably see the EU as protectionist.²¹

A similar scenario would perhaps apply to Malaysia. Malaysia has submitted a dispute complaint against the EU over its decision to phase out the import of unsustainable palm oil due to deforestation concerns. Malaysia and Indonesia are the top two palm oil exporters to the EU, accounting for more than 60 per cent of the EU's total palm oil imports.²² Therefore, Brussels's decision to ban the import of palm oil is perceived as discriminatory and unilateralist by both countries. Although both Kuala Lumpur and Brussels have committed to deescalating the dispute and finding a win-win solution, the ongoing conflict might take time to recede.

To complicate matters, the ongoing trade dispute might have a more significant geopolitical implication. In his visit to Kuala Lumpur in July 2022, China's Foreign Minister Wang Yi pledged that Beijing would increase its imports of palm oil from Malaysia.²³ It is not hard to imagine a scenario where the implementation of the EU CBAM would further exacerbate the tensions over various trade disputes between the EU and ASEAN countries and push ASEAN countries closer to environmentally less-regulated markets like China.

20. Alan HERVÉ. 29 March 2022. European Unilateralism as a Tool for Regulating International Trade: A Necessary Evil in a Collapsing Multilateral System. Robert Schuman Foundation. (<https://www.robert-schuman.eu/en/doc/questions-d-europe/qe-626-en.pdf>).

21. Konrad Adenauer Stiftung. March 2021. Perception of the Planned EU Carbon Border Adjustment Mechanism in Asia Pacific – An Expert Survey. Konrad Adenauer Stiftung. (<https://www.kas.de/en/web/recap/single-title/-/content/perception-of-the-planned-eu-carbon-border-adjustment-mechanism-in-asia-pacific-an-expert-survey>).

22. David Hutt. 22 July 2022. What Are the EU's Options in Palm Oil Standoff? Dw.Com. (<https://www.dw.com/en/what-are-eus-options-in-palm-oil-row-with-malaysia-and-indonesia/a-62564129>).

23. Hutt.

Among major trade partners, India, China, Russia, the US, and the United Arab Emirates are likely to oppose the implementation of the EU CBAM.²⁴ From a geopolitical view, this position will likely instigate trade wars and the formation of EU CBAM counter coalitions where major trade partners create trade alliances with more favourable rules. ASEAN will likely be attracted to these alliances.

EU CBAM's State of Play in ASEAN

The main rationale of implementing the EU CBAM is environmental concerns. The EU is currently aiming to help the world to decarbonise faster, but the EU cannot do it alone without active participation by other partners.

The EU has a strong reputation for helping the world achieve the Paris Agreement. According to a survey conducted by the ISEAS-Yusof Ishak Institute, the Southeast Asia Climate Outlook: 2022 Survey Report, the EU is perceived as the world's leader in demonstrating climate leadership among ASEAN citizens.²⁵ In contrast, EU trade policies might be perceived as unilateralist by ASEAN trade communities and economic policymakers. So, it is critical for the EU to balance environmental messages with maintaining trade fairness in the ASEAN region.

While many view that the ASEAN region will likely oppose the implementation of the EU CBAM due to their significant volume of commodity exports to the EU, the Konrad Adenauer Foundation study, *Perception of the Planned EU CBAM in Asia Pacific – An Expert Survey*, indicates that ASEAN countries have diverging views on the EU CBAM.²⁶ While it is expected that Indonesia's perceptions of the EU CBAM will be heavily influenced by the ongoing conflict with the EU over palm oil exports, the EU and Indonesia had a good trajectory in their collaboration on the improvement of the sustainable timber

24. Indra Overland and Rahat Sabyrbekov. 1 October 2022. Know Your Opponent: Which Countries Might Fight the European Carbon Border Adjustment Mechanism? Energy Policy 169 (1 October 2022): 113175. (<https://doi.org/10.1016/j.enpol.2022.113175>).

25. Sharon Seah et al. 8 September 2022. Southeast Asia Climate Outlook 2022 Survey Report. Singapore: ISEAS-Yusof Ishak Institute. (<https://www.iseas.edu.sg/wp-content/uploads/2025/07/2022-CCSEAP-Report-28-Oct.pdf>).

26. Konrad Adenauer Stiftung. Perception of the Planned EU Carbon Border Adjustment Mechanism in Asia Pacific – An Expert Survey.

agreement. If the EU provides more capacity building to assist Indonesia's carbon reduction measures, the EU CBAM will likely be more accepted. It is also essential to give a clear position on how the EU will ultimately utilise the revenues generated from the EU CBAM. Many international stakeholders expect the EU to reinvest the revenues into carbon mitigation projects in developing countries to ease the tariffs imposed on developing countries.

In Singapore, the landscape of perceptions is exceptionally different. Singapore does not oppose the EU CBAM as long as it is fair and compliant with WTO rules. At the same time, Singapore is concerned with the perceived unilateralist nature of the EU CBAM. Singapore may benefit from the EU CBAM because the country is known for being a financial hub and a leading country in the region for climate finance. Singapore believes that a multilateral, incentive-based approach would be more suitable to promoting the EU CBAM in the region.

In Thailand, meanwhile, the EU CBAM is expected to have no major impact on the Thai economy. Thailand could potentially leverage the EU CBAM to demand its businesses and industries to do more on climate transparency, but Thai stakeholders will also see the mechanism as administratively complex and may struggle to interact with it.

Due to ASEAN individual countries' diverging positions on the EU CBAM, the EU might not be able to implement a region-to-region CBAM policy. While ASEAN as a regional organisation might not have a common position in responding to the EU CBAM and ASEAN does not have any regional emissions trading schemes, it is still critical for the EU to leverage ASEAN's convening power roles to build more dialogues with individual ASEAN countries. There are several ASEAN bodies and independent organisations to be engaged with in the ASEAN region (non-exhaustively):

1. ASEAN Ministerial Meeting on the Environment (AMME)
2. ASEAN Economic Minister Meeting (AEM)
3. ASEAN Free Trade Area Council (AFTA Council)
4. ASEAN Finance Ministers Meeting (AFMMM)
5. ASEAN Directors-General of Customs Meeting (Customs DG)
6. ASEAN Business Advisory Council (ASEAN-BAC)

7. ASEAN Business Forum (ABF)
8. ASEAN Chamber of Commerce and Industry (ASEAN-CCI)
9. ASEAN Iron & Steel Industry Federation
10. Federation of ASEAN Shippers' Council
11. ASEAN Vegetable Oil Club (AVOC)

SECTION 3: CONCLUSIONS

Possible Scenarios

The momentum of the 45th anniversary of ASEAN-EU relations should be used to enhance political goodwill and cooperation of both sides on adherence to the rule of law. Due to the perceived risks, the EU might face a dilemma in implementing the EU CBAM in the ASEAN region. But, it is a step in the right direction to elevate international partners' climate change actions and to ensure that everyone prioritises their efforts in reducing global carbon emissions.

However, in doing so, the EU must respect the CBDR principle under the UNFCCC and the MFN principle under the WTO. The EU must ensure calibrated approaches in implementing the EU CBAM. In addition, the EU could also consider these technical aspects of the implementations in ASEAN countries:

1. The EU CBAM should have an appropriate sequencing, with a timeline that includes a transitional period, an adjustment to implementation period and a monitoring assessment period to ensure stakeholders in ASEAN are not left behind.
2. The EU might consider incentivising trade partners who want to voluntarily participate in the EU CBAM during the trial phase to build up the confidence and trust of stakeholders.
3. The EU CBAM should also seek to complement or at least incentivise trade partners' domestic carbon pricing mechanisms to build up a more cohesive international carbon emissions trading scheme.

4. In communicating the EU CBAM with stakeholders in the ASEAN region, the EU should ensure cross-sectoral cooperation between environmental protection agencies and trade representatives to balance trade fairness and environmental considerations.

5. Technological support, capacity building, and research and development support must be provided to the least-developed countries in ASEAN.

6. The EU must also channel back the collected revenues of the EU CBAM in ASEAN to carbon-mitigation projects to incentivise trading partners.

In parallel, ASEAN should collectively consider the following points for accommodating sustainability practices in trade policies so as to adapt to the EU CBAM:

1. ASEAN should strengthen and coordinate among the sectoral bodies of trade and investment issues under the ASEAN Economic Community Pillar together with environmental management of climate change efforts under the ASEAN Socio-Cultural Pillar and political protocol under the ASEAN Political-Security Pillar for adapting to the EU CBAM.

2. ASEAN should resume discussions with the EU to accommodate the trade and environmental measures of the EU CBAM into the ongoing Free Trade Agreement (FTA) negotiation without causing trade barriers.

3. As the EU CBAM is targeted on iron and steel, cement, fertilizer, aluminum and electricity, which are raw and secondary materials of production inputs, ASEAN should consider the rule of origin and the global value chains of finished goods and services. Additionally, ASEAN should consider geographical locations as imports, exports, and production and assembly activities are dispersed across the region, so as to ensure that the burden of the EU CBAM will be shared fairly across the region.

4. ASEAN should systematically enhance carbon pricing mechanisms in the region. This could facilitate a bloc-to-bloc emissions trading system and streamline the implementation of the EU CBAM.
5. ASEAN countries should change their perception that the EU CBAM is a tariff imposed on their exports. Rather, it is a way to make their exports more aligned with the Environmental, Social, and Governance (ESG) movement and competitive in the global market.
6. ASEAN should coordinate within the region and be active in engaging with major trading partners as well as external dialogue partners for improvement of the EU CBAM and regional climate change actions.

POLICY RECOMMENDATIONS

Ensuring that the EU upholds the multilateral approach of the CBAM is critical. We propose that the EU should use a more calibrated approach in imposing the EU CBAM on individual ASEAN countries. We suggest three criteria as indicators to make the EU balance environmental protection objectives and trade fairness.

First, the EU must consider the political risks of the EU CBAM to the imposed countries. Implementing the EU CBAM on international trade partners when the current state of relations is shaky will only exacerbate disputes, discouraging trade partners from pursuing economic cooperation with the EU, or worse, making their trade relations with countries that have less robust environmental regulations closer.

Second, the EU must consider the economic development level of trade partners, making sure they have the capacities to follow the rules and regulations established in Brussels. Imposing the EU CBAM without considering this aspect will likely diminish the EU's reputation as a helpful strategic partner that assists the world in achieving prosperity and equality.

Third, the EU must consider the state of its trade partners' commitments to the Paris Agreement, including evaluating partner countries' Nationally Determined Contributions (NDCs) submissions to the UNFCCC. The EU can

be stricter with countries that do not demonstrate climate change efforts or manifest a political will that does not align with the global goal of carbon emissions reduction.

The following section elaborates on further inputs for more calibrated approaches on the EU CBAM with respect to individual ASEAN countries.

Brunei Darussalam

Currently, Brunei does not have a bilateral trade agreement with the EU. The EU is Brunei's seventh largest trading partner in goods, with an overall value of €559.2 million in 2019.²⁷ Meanwhile, the EU is Brunei's third largest supplier of goods.

Brunei is considered a high-income economy under the World Development Indicator by the World Bank, with a current GDP per capita of US\$31,722.

Brunei submitted their updated NDCs to the UNFCCC on 31 December 2020. Brunei Darussalam is committed to reducing its Greenhouse Gas (GHG) emissions by 20 per cent relative to Business-As-Usual levels by 2030.²⁸ The Brunei Darussalam National Climate Change Policy (BNCCP) indicated that it will impose a price on carbon emissions for the industrial sector by 2025 and is seeking to establish a proper Monitoring, Reporting and Verification (MRV) system so as to ensure accuracy and credibility in baseline emissions data for imposing carbon pricing.²⁹

Implementing the CBAM on Brunei will not likely cause a dispute in future Brunei-EU relations as trade activities between two sides remain low in value currently. Brunei is also considered a high-income nation. Brunei also indicates that it will consider some carbon pricing mechanisms, making it ready to adapt to transnational carbon pricing in the future. There are no high risks involved in implementing the EU CBAM on Brunei Darussalam.

27. EU-ASEAN Strategic Partnership. BRUNEI DARUSSALAM – EU-ASEAN. Accessed 31 October 2022. (<https://euinasean.eu/cooperation/bilateral-cooperation/brunei-darussalam/>).

28. Brunei Darussalam First NDC | UNFCCC. 2 June 2022, (<https://unfccc.int/documents/497350>).

29. Brunei Darussalam First NDC | UNFCCC.

Cambodia

Cambodia and the EU are currently enjoying an uptick in trade relations under the ASEAN-EU cooperation framework. The EU is ranked as Cambodia's fifth biggest trade partner, accounting for 9 per cent of the country's total trade. Meanwhile, Cambodia is the EU's 61st largest trading partner (accounting for 0.1 per cent of the EU's total trade).³⁰ Bilateral trade between Cambodia and the European Union was valued at €4.5 billion (\$4.98 billion) in 2021, up 4.6 per cent from a year earlier.³¹ Cambodia's main export commodities to the EU are agricultural products, including milled rice. Other exports include textiles, footwear, travel goods and bicycles. These sectors will not be covered under the initial version of the EU CBAM.

Cambodia is considered a lower-middle income country under the World Development Indicator by the World Bank, with a current GDP per capita of US\$1,591. Cambodia is among one of the three least-developed countries in ASEAN.

Cambodia's updated NDCs seek to decrease emissions by 41.7 per cent from the Business-as-Usual scenario by 2030, with half of that reduction concentrated in the Forest and Land Use Sector (FOLU) and the rest primarily in the energy, agriculture, industry, and waste sectors.³² There is no signal from Cambodia that the country will adopt carbon pricing and tax to encourage businesses to adopt sustainable practices.

It is quite likely that Cambodia is not ready to adapt to the EU CBAM, although the EU CBAM will not cause significant impacts on Cambodia's current exports to the EU. But, it is predicted that the EU and Cambodia will deepen their trade relations in the future with Cambodia possibly expanding the range of their export commodities to the EU. Hence, the country must pay attention and be ready to adapt to the EU CBAM. Meanwhile, consider-

30. European Commission. EU Trade Relations with Cambodia. Accessed 31 October 2022. (https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/cambodia_en).

31. Khmer Times. Cambodia-EU Trade up 4.6 Percent to \$4.98 Billion Last Year. Khmer Times, 10 March 2022. (<https://www.khmertimeskh.com/501039659/cambodia-eu-trade-up-4-6-percent-to-4-98-billion-last-year/>).

32. NDC Partnership. Cambodia. NDC Partnership, Country: Cambodia (blog). Accessed 31 October 2022. (<https://pia.ndcpartnership.org/country-stories/cambodia/>).

ing Cambodia's economic development level and current climate ambitions, the EU must collaborate closely with Cambodia policymakers in assisting the country to ramp up its climate change actions.

Indonesia

Indonesia and the EU launched the Indonesia-European Union Comprehensive Economic Partnership Agreement (Indonesia-EU CEPA) in November 2021.³³ In 2021, Indonesia's exports to the EU accounted for 8.5 per cent of its global export of goods, amounting to €16.8 billion. Its imports from the EU accounted for 5.1 per cent of its global import of goods, amounting to €7.9 billion.³⁴ Indonesia's most important export commodities are oil and gas, minerals, crude palm oil, electrical appliances and rubber products. The EU's decision to ban the use of palm oil biofuels in Europe after 2021 has raised a trade conflict between the two sides as Indonesia depends significantly on the EU as a market for its palm oil products. Data shows that the EU is Indonesia's second-largest palm oil export destination with 14.35 per cent market share, after India with a market share of 25.37 per cent.³⁵

Indonesia is considered a lower-middle income country under the World Development Indicator by the World Bank, with a current GDP per capita of US\$4,291.

According to the World Resources Institute, Indonesia is the 8th largest global carbon emitter, which is a result of its land use, land-use change and forestry (LULUCF). According to a piece of analysis by the Climate Action Tracker, Indonesia is improving its long-term planning towards net zero, but its NDCs remain unchanged. Indonesia submitted its updated NDCs in July

33. Asia Regional Integration Center. 1 November 2021. Indonesia-European Union Comprehensive Economic Partnership Agreement Free Trade Agreement. (<https://aric.adb.org/fta/indonesia-european-union-comprehensive-economic-partnership-agreement>).

34. Home and Delegation of the European Union to Indonesia and Brunei Darussalam. 10 October 2022. EU Trade and Investment with Indonesia 2022/2023. (https://www.eeas.europa.eu/delegations/indonesia/eu-trade-and-investment-indonesia-20222023_en?s=168).

35. Try Ananto Wicaksono. 17 February 2021. Indonesia's Fight against the EU Palm Oil Ban. Geopolitical Monitor (blog). (<https://www.geopoliticalmonitor.com/indonesias-fight-against-the-eu-palm-oil-ban/>).

2021, where it did not strengthen the country's 2030 carbon emissions target.³⁶ Indonesia is exploring a carbon tax to help raise its climate ambitions. A pilot project has been directed for coal-fired power plants at this moment. However, it is expected that the price will remain low at US\$2.10 per ton of CO₂e, far from the carbon tax rate suggested by the World Bank and the International Monetary Fund, which is between \$30 and \$100 per ton of CO₂e for developing countries.³⁷

Considering the strategic risks and the state of economic development of Indonesia, the EU might have difficulties in imposing the EU CBAM on Indonesia. But, as one of the top ten global emitters, Indonesia's role in raising its climate ambitions is critical. The EU must initiate several mechanisms to make the EU CBAM acceptable in the country and as a means to raise its climate change actions.

Laos

Currently, Laos and the EU do not have an existing FTA. However, the EU ranked as the fourth biggest trade partner of Laos (after Thailand, China and Vietnam), accounting for 4.2 per cent of the country's total trade.³⁸ Textiles, footwear and agricultural products dominate EU imports from Laos. These main export commodities are not included in the EU CBAM's exposed products, and thus Laos is not directly impacted.

Laos is considered a lower-middle income country under the World Development Indicator by the World Bank, with a current GDP per capita of US\$2,551. It is among one of the three least-developed countries in ASEAN.

Laos raised its ambition in its revised NDCs with an unconditional emissions reduction target of 60 per cent by 2030, relative to the baseline sce-

36. Climate Action Tracker. 23 July 2021. Indonesia. (<https://climateactiontracker.org/climate-target-update-tracker/indonesia/>).

37. Petra Christi. 14 June 2022. Does Indonesia's Carbon Tax Have the Power to Trigger a Sustainable Market Shift? SEADS (blog). (<https://seads.adb.org/solutions/does-indonesias-carbon-tax-have-power-trigger-sustainable-market-shift>).

38. EU Trade Relations with Laos. Accessed 31 October 2022. (https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/laos_en).

nario.³⁹ Laos also announced net-zero greenhouse gas emissions by 2050. The country also focuses on mitigation measures in the forestry and energy sectors to achieve its target. Laos has demonstrated a political will to achieve its emissions reduction target with the promulgation of a number of related laws and regulations such as the new forestry law in 2019 and the Decree on Climate Change in September 2019.⁴⁰ However, the country still faces some barriers to building up more ambitious climate change actions, such as poor coordination among government agencies, lack of accurate and credible data, as well as the need for funds and institutional support.

Laos might have difficulties conforming to the EU CBAM due to a lack of technical capacity and expertise. The EU must collaborate and help the country to adjust granularly to the EU CBAM regulations.

Malaysia

Malaysia and the EU have been exploring a Malaysia-EU Free Trade Agreement since 2012, and currently, the negotiation is still on hold.⁴¹ Like Indonesia, Malaysia and the EU are currently not on good terms due to the ongoing conflict over Malaysia's palm oil sustainability standard. The EU is the fifth largest trading partner of Malaysia (after China, Singapore, South Korea and the US), accounting for 7.4 per cent of the country's total trade. In 2020, Malaysia became the EU's 20th largest trading partner in goods.⁴² Malaysia exports machinery and appliances to the EU – secondary goods that may include a component of covered goods under the EU CBAM (steel/aluminum). If the EU extends the coverage of the EU CBAM to secondary goods, Malaysia's exports might be exposed.

39. UNDP Climate Promise. Lao PDR. UNDP Climate Promise. Accessed 31 October 2022. (<https://climatepromise.undp.org/what-we-do/where-we-work/lao-pdr>).

40. T. Vongvisouk et al. 24 February 2020. Lao PDR's Nationally Determined Contribution (NDC): Progress, Opportunities, and Challenges in the Forestry Sector. Center for International Forestry Research. (<https://doi.org/10.17528/cifor/007557>).

41. Asia Regional Integration Center. Free Trade Agreements.

42. European Commission. EU Trade Relations with Malaysia. Accessed 31 October 2022. (https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/malaysia_en).

Malaysia is considered an upper-middle income country under the World Development Indicator by the World Bank, with a current GDP per capita of US\$11,371.

Malaysia submitted its updated NDCs to the UNFCCC in October 2021. The country has removed its conditional carbon emissions target upon receiving international assistance.⁴³ The Malaysian government also made a modest increase in its unconditional carbon emissions target with a carbon intensity reduction of 45 per cent from 2005 levels (previously only 35 per cent from 2005 levels). Malaysia also announced its net-zero target of as early as 2050.

The EU might face political risks in implementing the EU CBAM in Malaysia. In general, Malaysia has shown modest progression in their NDCs submissions to the UNFCCC, showing that the country has the capacity to adopt global regulations and decarbonisation trends. The EU must consider resuming the delayed FTA negotiation with Malaysia and push for an integration of sustainability components in the discussion.

Myanmar

Myanmar and the EU have not established a free trade agreement yet. But both sides initiated the investment protection agreement in 2015. As of 2021, the value of international trade between Myanmar and the EU stood at €2.6 billion. The EU is deemed Myanmar's fourth most significant trading partner (after China, Thailand and Singapore), accounting for 7.2 per cent of the country's total trade. The EU imported €2.3 billion worth of goods from Myanmar, particularly textiles, manufactured goods, footwear and agricultural products. Meanwhile, the EU exported goods worth €322 million to Myanmar, which includes machinery, transport equipment and chemicals.⁴⁴

Yet, Myanmar has been subjected to domestic political instability due to the military coup since February 2021. ASEAN has deployed a special envoy

43. UNDP Climate Promise. Malaysia. UNDP Climate Promise. Accessed 31 October 2022. (<https://climatepromise.undp.org/what-we-do/where-we-work/malaysia>).

44. European Commission. EU Trade Relations with Myanmar. Accessed 31 October 2022. (https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/myanmar_en).

to facilitate Myanmar to implement the Five-Point Consensus, which aims at restoring national political stability and, ultimately, international trade. The EU supports ASEAN in its peace resolution efforts in Myanmar, including the ASEAN special envoy, the Five-Point Consensus as well as humanitarian assistances for the affected people. Progress on a peaceful negotiation and restoration in Myanmar are yet to be realised. This will be a significant barrier to executing the EU CBAM on trading activities and environmental conservation with Myanmar.

Myanmar is considered a lower-middle income country under the World Development Indicator by the World Bank, with a current GDP per capita of US\$1,187. Myanmar is among one of the three least-developed countries in ASEAN.

Myanmar submitted its NDCs in July 2021. As of 2018, Myanmar is one of the least greenhouse gas emitting nations in the world. The country focuses on climate adaptation, disaster risk reduction and mitigation within key sectors such as energy, agriculture and forestry in line with international financial and technical assistance in order to meet the emissions reduction target by 2030. The objectives are mainstreamed to the major policies of Myanmar Climate Change Policy (2019), Myanmar Climate Change Strategy (2018-2030) as well as Myanmar Climate Change Master Plan (2018-2030). The role of carbon pricing initiatives is yet to be observed in Myanmar.⁴⁵

It is a high risk for the EU to impose the CBAM on Myanmar as the current political situation remains uncertain. Myanmar's low economic development status and an absence of carbon pricing will make it hard for the EU to directly impose the EU CBAM on Myanmar.

The Philippines

The Philippines and the EU officially launched free trade agreement negotiations in 2015. In 2019, bilateral trade in goods stood at €15.2 billion, whilst for trade in services it was €4.9 billion. In 2021, the EU was considered as the Philippines' fourth largest trading partner, accounting for 7.9 per cent of the

45. Nationally Determined Contributions The Republic of the Union of Myanmar. N.d. (<https://unfccc.int/sites/default/files/NDC/2022-06/Myanmar%20Updated%20%20NDC%20July%202021.pdf>).

total trade of the Philippines. On the other side, the Philippines was the EU's 39th largest trading partner and accounted for 0.4 per cent of the EU's total trade. Machinery, transport equipment, chemicals and food products are the main exports from the EU to the Philippines. The major exports of the Philippines to the EU are office and telecommunication equipment, machinery, food products as well as optical and photographic instruments.⁴⁶ The Philippines actively engages the EU in the free trade agreement negotiations so as to secure duty-free market access, attract investments and improve competitiveness.

The Philippines is considered a lower-middle income country under the World Development Indicator by the World Bank, with a current GDP per capita of US\$3,548.

The Philippines submitted its updated NDCs in April 2021, demonstrating its commitment to the UNFCCC. The country relies upon a whole-of-government and civil society approach with the inclusive participation of all stakeholders. The Philippines refers to important national documents such as the Climate Change Act of 2009, the National Climate Change Action Plan 2011-2028 and the Philippine Development Plan 2017-2022. For climate change mitigation, the Philippines aims to develop a sustainable consumption and production approach with climate finance, technology and capacity building. For climate change adaptation, the Philippines focuses on the thematic areas of food security, water, environmental stability, human security, climate-smart cities, sustainable energy and knowledge development. Carbon pricing is yet to be observed in the national intended plans and actions.⁴⁷

The Philippines is regarded as a prospective country where the EU CBAM can be used to enhance trade relations and carbon reduction for climate change mitigation. The country has the enabling conditions of supporting political and trade activities. The only challenges are the status of economic development and the need for capacity building to assist the Philippines to adjust to the EU CBAM.

46. European Commission. EU Trade Relations with Philippines. Accessed 31 October 2022. (https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/philippines_en).

47. Republic of the Philippines Nationally Determined Contribution Communicated to the UNFCCC on 15 April 2021. N.d. (<https://niccdies.climate.gov.ph/files/documents/Philippines%20-%20NDC.pdf>).

Singapore

Singapore is the country which has the highest number of free trade agreements in ASEAN, with 45 agreements both in effect and under negotiation. This demonstrates Singapore's capacity to comply to rules-based agreements with trade partners. The Singapore-EU Free Trade Agreement took effect on 21 November 2021. Singapore and the EU have been enjoying an uptick in trade relations. EU exports to Singapore expanded by 10.4 per cent, reaching €15 billion, while EU imports from Singapore went up by 39.7 per cent, amounting to €10.5 billion in the first half of 2022, evidencing a steady economic recovery from the COVID-19 pandemic trade disruptions.⁴⁸ Singapore's main exports to the EU are organic chemicals and pharmaceutical products, which are not covered under the EU CBAM.

Singapore is considered a high-income country under the World Development Indicator by the World Bank, with a current GDP per capita of US\$72,794.

Singapore submitted its updated NDCs to the UNFCCC in March 2020, demonstrating some progression, such as moving from an emissions intensity target to an absolute cap on emissions.⁴⁹ The country also announced its net-zero target of by 2050. Recently, Singapore also made a correction in their NDCs and submitted a more ambitious target of 60 million tonnes of carbon dioxide equivalent (MtCO₂e) in 2030 after peaking emissions.⁵⁰ In addition, Singapore was the first country in ASEAN that launched a carbon tax, in 2019. The carbon tax level is set at S\$5/tCO₂e for the period of 2019

48. Delegation of the European Union to Singapore. EU-Singapore Trade in Goods Increased by 20.7% in First Half of 2022 | EEAS Website. Accessed 31 October 2022. (https://www.eeas.europa.eu/delegations/singapore/eu-singapore-trade-goods-increased-207-first-half-2022_en?s=178).

49. Climate Action Tracker. Singapore. Accessed 31 October 2022. (<https://climateactiontracker.org/climate-target-update-tracker/singapore/>).

50. Singapore Commits to Achieve Net Zero Emissions by 2050 and to a Revised 2030 Nationally Determined Contribution; Public Sector and Jurong Lake District to Lead the Way with Net Zero Targets. 25 October 2022. (<https://www.nccs.gov.sg/media/press-releases/singapore-commits-to-achieve-net-zero/>).

to 2023. But this price will be adjusted to S\$25 in 2025-2026, and to S\$45 in 2026-2027, with a view to reaching \$50-80 by 2030.⁵¹

Singapore will not be directly exposed by the EU CBAM as the country does not export goods covered under this mechanism. Singapore has the capacity to adjust should the EU CBAM require some stakeholders from the country to adopt it. The country's experiences in managing technical negotiations and dealing with various trade agreements are good indicators that the country can swiftly adapt to sustainability regulations should the EU CBAM come into effect. The current domestic carbon tax in Singapore can also be an enabling factor for the country to adjust to the EU CBAM.

Thailand

Thailand and the EU launched free trade agreement negotiations in March 2013. Despite negotiations being put on hold in 2014, the EU has tried to further engage with Thailand to resume comprehensive free trade agreement negotiations. As of 2020, Thailand and the EU had bilateral trade of €29 billion. The EU is the fourth largest trading partner of Thailand (after China, Japan and the US) with 7.5 per cent of the country's total trade. Thailand is the 26th largest trading partner of the EU. Thailand's exports to the EU totalled €15.1 billion, with the key products being machinery, electronics, transport equipment, manufactured articles and food. On the other hand, the EU's exports to Thailand were worth €11.3 billion, including machinery, transport equipment, chemicals and related products.⁵² Recently, the EU resumed the trade negotiations with Thailand in 2022 by using various guiding documents on the issues of trade in goods and services, e-commerce, intellectual property rights and government procurement.⁵³

51. NCCS. Carbon Tax. Accessed 31 October 2022. (<https://www.nccs.gov.sg/singapores-climate-action/carbon-tax/>).

52. European Commission. EU Trade Relations with Thailand. Accessed 31 October 2022. (https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/thailand_en).

53. ASEAN Briefing. 4 August 2021. Thailand and the EU Resume Free Trade Agreement Negotiations. ASEAN Business News. (<https://www.aseanbriefing.com/news/thailand-and-the-eu-resume-free-trade-agreement-negotiations/>).

Thailand is considered an upper-middle country under the World Development Indicator by the World Bank, with a current GDP per capita of US\$7,233.

Thailand submitted its updated NDCs to the UNFCCC in October 2020. The country aims to reduce greenhouse gas emissions by 20 per cent in 2030 based on proper access to technology, capacity building and financial resources while also developing the Long-term Low Greenhouse Gas Emission Development Strategy (LT-LEDS) as the mitigation component. For climate change adaptation, Thailand prioritises water resources, agriculture, tourism, public health, natural resources management and human security.⁵⁴ Currently, the Thailand Greenhouse Gas Management Organisation actively engages with a carbon pricing development mechanism at the national level together with the EU CBAM proposition for increasing competitiveness and reducing carbon emissions.⁵⁵

It is an opportunity for the EU to impose the CBAM in order to incentivise trade activities and environmental solutions in Thailand. Considering infrastructure, political will, and the trade situation, as well as Thailand's status as an upper-middle income country, Thailand has the enabling factors to swiftly adopt the EU CBAM regulations.

Vietnam

It is observed that Vietnam signed a Trade Agreement and an Investment Protection Agreement on 30 June 2019 to eliminate tariffs, reduce trade barriers, open markets, and enforce the agreed rules with the EU. Vietnam is regarded as the EU's 15th largest trade partner. The EU mainly exports high-tech products to Vietnam, including electrical machinery and equipment, aircraft, vehicles and pharmaceutical products. Vietnam's main exports to the EU are telephone sets, electronic products, footwear, textiles and clothing,

54. Thailand's Nationally Determined Contribution. N.d. (<https://unfccc.int/sites/default/files/NDC/2022-06/Thailand%20Updated%20NDC.pdf>).

55. TGO. MNRE; TGO in Collaboration with ERCST Disseminate the Study on the Economic Impact of The EU Carbon Border Adjustment Mechanism (CBAM) on Thailand. TGO. Accessed 31 October 2022. (<http://www.tgo.or.th/2020/index.php/en/post/mnre;-tgo-in-collaboration-with-ercst-disseminate-the-study-on-the-economic-impact-of-the-eu-carbon-border-adjustment-mechanism-cbam-on-thailand>).

coffee, rice, seafood and furniture.⁵⁶ It was recently stated that Vietnam has a trade surplus over the EU of US\$15.5 billion during the first six months of 2022. This signals that trade is a critical activity for Vietnam's COVID-19 recovery strategy and Vietnam will likely adhere to international trade rules and maintain good relationships with every partner.⁵⁷

Vietnam is considered a lower-middle income country under the World Development Indicator by the World Bank, with a current GDP per capita of US\$3,694.

Vietnam's NDCs were submitted in July 2020, and stated a conditional target of 27 per cent emissions reduction by 2030. Vietnam's climate change actions focus primarily on energy and industry as well as agriculture, forestry and other land use sectors. Vietnam refers to the Law on Economical and Efficient Use of Energy (6/2010) and the National Climate Change Strategy (12/2011) for decarbonising the energy and industry sectors. For the agriculture, forestry and land use sectors, Vietnam mentions the Land Law (2013) and the Law on Forestry (2017). The country aims to reduce greenhouse gas emissions in the energy sector by 5.5 per cent, the agriculture sector by 0.7 per cent, and the waste sector and industrial processes by 1 per cent and 0.8 per cent, respectively.⁵⁸

Vietnam's economy is currently improving, thanks to the resumption of trade activities. Vietnam's regulators will likely see the EU CBAM as a tool to improve Vietnam's global competitiveness and a way to continue expanding its trade activities in the EU. But at the same time, industry players in Vietnam might think of the EU CBAM as a significant barrier to Vietnam's tremendous export growth. The EU can further introduce the EU CBAM as a means to improve Vietnam's environmental protection efforts and supply chain sustainability for the future.

56. EU Trade Relations with Vietnam. Accessed 31 October 2022. (https://policy.trade.ec.europa.eu/eu-trade-relationships-country-and-region/countries-and-regions/vietnam_en).

57. Vietnam Briefing. 27 July 2022. Vietnam-EU Trade Surplus Underlines Growing Trade, Relations. Vietnam Briefing News. (<https://www.vietnam-briefing.com/news/vietnam-eu-trade-surplus-underlines-growing-trade-relations.html/>).

58. ASEAN Secretariat. 2022. ASEAN State of Climate Change Report. (https://asean.org/wp-content/uploads/2021/10/ASCCR-e-publication-Correction_8-June.pdf).

06

Developing a Smart City

Jakarta and Phnom Penh's
Youth Perspectives

Fadelia Deby Subandi | Chhay Lim

Abstract

Collaboration on the design and implementation of smart city initiatives will help authorities to understand and incorporate the needs of various stakeholders, and instil a greater sense of ownership and stewardship of smart city projects, as stated by the Secretary-General of the Association of South-east Asian Nations. In this work, we adopt a similar study conducted in European cities by Georgiadis et al. (2021). We present a survey of a total of 228 youth (122 youth of Jakarta and 106 youth of Phnom Penh), on their perceptions of the “smart city” concept, and their opinions regarding the most crucial dimension to improve in Jakarta, Indonesia and Phnom Penh, Cambodia.

The final results of this study revealed several interesting outcomes. First, this study showed that Jakarta youth are more familiar with the “smart city” concept than their peers in Phnom Penh. Youth who responded that they were unfamiliar with the concept primarily showed their interest in learning more about it and to participate in the decision-making regarding their city through digital platforms. Jakarta’s youth perceived that sustainable development and information and communications technology (ICT) concepts were closely correlated with the smart city concept. Phnom Penh’s youth considered citizens’ involvement as the most parallel concept. Most Jakarta and Phnom Penh participants have seen efforts in their respective cities to transform into smart cities.

Almost half of the Jakarta and Phnom Penh youth responded that the “smart mobility” dimension did not need further improvement, showing that mobility is not the biggest concern for most respondents. However, respondents emphasised the importance of improving the “smart environment” dimension; it is regarded as the most crucial aspect and required advancement since there are still fewer measures implemented to tackle environmental challenges compared to the other smart city dimensions. In addition, the most critical challenge for the development of a smart city found in both cities is citizens’ involvement. The authorities should provide a channel to incorporate the youth’s aspirations and concerns in developing their city, as they are the primary beneficiaries of smart city projects.

INTRODUCTION

Today, more than half of the global population live in cities and cities will host two-thirds of all people by 2050. Cities consume over 75 per cent of the world's energy and generate 75 per cent of related emissions.¹ However, in order to achieve Sustainable Development Goal 11, cities in the world are faced with complex challenges, such as providing basic healthcare, education, and public services, including housing and water management, to their citizens – while having limited resources.

In responding to these challenges, cities around the world have adopted smart city designs as an alternative solution for better city management, especially given the COVID-19 pandemic, with cities having faced setbacks from the multidimensional crisis. The COVID-19 global pandemic has accelerated the trend toward smart cities. Data-driven cities, which utilise data and information technology to connect and integrate urban systems and services to improve the quality of life for their citizens, have responded better to the crisis of the recent pandemic due to their smart infrastructure and data analysis.²

Prior to the pandemic, Association of Southeast Asian Nations (ASEAN) member states had a common goal of creating smart and sustainable urban development and had gathered in 2018 to establish the ASEAN Smart Cities Network (ASCN) as a collaborative platform.³ Collaboration on the design and implementation of smart city initiatives will help authorities to understand and incorporate the needs of various stakeholders, and instil a greater sense of ownership and stewardship of smart city projects, as stated by the Secretary-General of ASEAN.⁴ With that being said, one cannot deny the important role of the young generation, as they are one of the biggest popu-

1. An Urban World. Urban 20. (<https://www.urban20.org>).

2. Steph Pietras, Alyson Marks, and Grant Cameron. 2021. Mobilizing Smart City Growth for a Resilient Future. Thematic Research Network on Data and Statistic. (<https://www.sdsntrends.org/blog/2021/mobilizing-smart-city-growth-for-a-resilient-future?locale=en>).

3. ASEAN. 2018. ASEAN Smart Cities Concept Note. (<https://asean.org/wp-content/uploads/2019/02/ASCN-Concept-Note.pdf>).

4. ASEAN. 2021. Sustainable Cities. (<https://asean.org/wp-content/uploads/2021/08/The-ASEAN-Sustainable-Cities-June-July-2021.pdf>).

lation segments in cities across the world, and are considered to be more adaptive to technological change in terms of their innovative perceptions and basic digital literacy skills.⁵ It is also believed that the large demographic advantage and active involvement of youth is the key to achieving the Sustainable Development Goals. Indonesia's youth constitute 24 per cent of the population and they will lead the developing country as it aims to become a developed country by 2045.⁶ Similarly, Cambodia has a very young demographic makeup after decades of civil war, with people aged under 35 years old accounting for two-thirds of the total population. Therefore, policy recommendations in this policy brief are based on the results from the survey of Jakarta and Phnom Penh's youth – both cities being ASEAN Smart Cities Network pilot cities – and would be beneficial for the future development of the respective cities.

LITERATURE REVIEW

The concept of smart city has quite numerous definitions. As stated by Georgiadis (2019), the smart city concept is defined as a concept that can address challenges such as the social, economic, and environmental aspects that modern cities are facing currently and will face in the future.⁷ Smart city development cuts across many sectors, such as transport, water quality, energy, healthcare, education, public services, data, and information and communications technology (ICT).⁸ Most of the definitions include similar fundamentals, such as sustainability, agility, connectivity, inhabitation by

5. Lim Chhay. 2021. A People-Oriented and People-Centred ASEAN Community: A Cambodian Youth Perspective. In Leng Thearith, Cheunboran Chanborey, Lim Menghour, Kimly Ngoun, Maurizio Paciello and Lim Chhay (eds.). 2021. Cambodia's ASEAN Chairmanship 2022: Priorities and Challenges. Phnom Penh: Konrad Adenauer Stiftung & Asian Vision Institute.

6. Statistics Indonesia. 2020. Statistik Pemuda Indonesia. (<https://www.bps.go.id/publication/2020/12/21/4a39564b84a1c4e7a615f28b/statistik-pemuda-indonesia-2020.html>).

7. Athanasios Georgiadis, Panayiotis Christodoulou, and Zinon Zinonos. 2021. Citizen's Perception of Smart Cities: A Case Study. *Applied Sciences*, 11 (6), 2517. (doi: <https://doi.org/10.3390/app11062517>).

8. ASEAN. 2018. ASEAN Smart Cities Concept Note. (<https://asean.org/wp-content/uploads/2019/02/ASCN-Concept-Note.pdf>).

empowered stakeholders, and being largely enabled by ICT. A smart city is able to use technology to gather multi-sourced data and convert them into actionable intelligence for the efficient and sustainable management of the city.

Although there are many applications that can be utilised to support the concept of smart cities, the concept relies on the city's administration and citizens utilising technology in "smart" ways.⁹ Based on Giffinger (2007), there are six main pillars of a smart city, consisting of smart governance, smart mobility, smart economy, smart environment, smart people, and smart living; collectively constituting the Smart City Model.¹⁰ Initially, each one of the six dimensions or pillars is linked to several individual factors. The dimensions constitute a smart city model, which was developed as a ranking tool to evaluate mid-sized European smart cities in the corresponding fields of governance, mobility, people, economy, living, and environment. The six-dimension model allows the examination of a city's current state and can identify the areas that need further development to reach an appropriate level of being "smart".¹¹ The main focus of the six-dimension model is to solve the various problems that appear in actual cities. Each smart application should contribute to at least one of the six dimensions without negatively affecting any of the other dimensions.

9. Athanasios Georgiadis, Panayiotis Christodoulou, and Zinon Zinonos. 2021. Citizen's Perception of Smart Cities: A Case Study. *Applied Sciences*, 11 (6), 2517. (doi: <https://doi.org/10.3390/app11062517>).

10. Rudolf Giffinger. 2007. *Smart Cities Ranking of European Medium-Sized Cities*. Center of Regional Science. (http://www.smart-cities.eu/download/smart_cities_final_report.pdf).

11. *Ibid.*

Figure 1. Smart city pillars and applications.

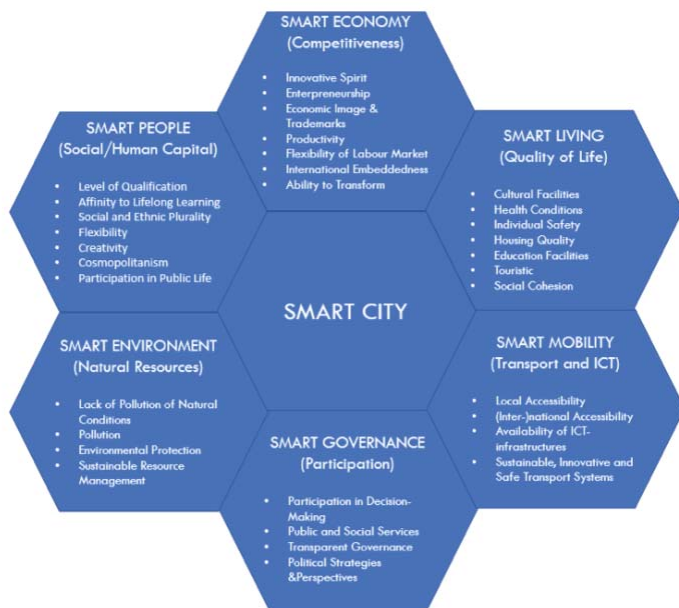


Photo credit: Research Gate.

METHODOLOGY

In order to examine the perspectives of Jakarta and Phnom Penh’s youth in regard to the smart city concept, and to present their opinions and beliefs about the current level of “smartness” that appears in the city they currently live in, a survey was adapted from the research conducted by Georgiadis (2021)¹² in the smart city of Thessaloniki, Athens, Paphos, and other cities in Greece and Cyprus. The survey was translated to Bahasa Indonesia and Khmer.

12. Athanasios Georgiadis, Panayiotis Christodoulou, and Zinon Zinonos. 2021. Citizen's Perception of Smart Cities: A Case Study. *Applied Sciences*, 11 (6), 2517. (doi: <https://doi.org/10.3390/app11062517>).

For conducting this quantitative research, we have opted for a questionnaire as the tool for collecting data, using SurveyMonkey Premium as our platform. The data were collected from 19 April to 2 May 2022 for Jakarta and from 8 June to 16 August 2022 for Phnom Penh. The questionnaire was only issued to youth who reside in Jabodetabek (Jakarta, Bogor, Depok, Tangerang, Bekasi) and the Phnom Penh area. The questionnaire was filled out by a total of 228 youth (18-35 years old) respondents.

RESULTS AND DISCUSSION

The aim of the study is to learn about youth perspectives in regard to the smart city concept and to present their opinions and beliefs about the current level of “smartness” that appears in the city they currently live in. The question after the demographic question was asked to learn about participants’ familiarity with the “smart city” term and to separate participants who were familiar with the term from those who were not (*“Have you ever heard the term ‘Smart City’ before?”*).

- The results showed that 89.3 per cent of the participants from Jakarta answered “Yes”. This means that 109 out of 122 participants stated that they had at least heard of the “smart city” term or had decent knowledge about it.
- In Phnom Penh, 23 out of 106 (21.69 per cent) participants had not heard about the “smart city” term, or 83 (78.30 per cent) of participants had heard about the “smart city” term before.

Figure 2. Familiarity with “smart city” term in Jakarta.

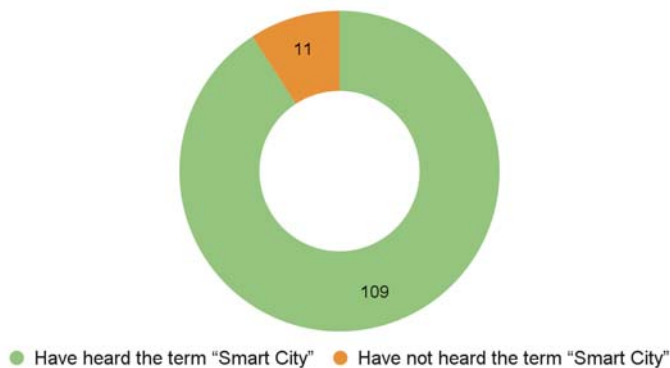
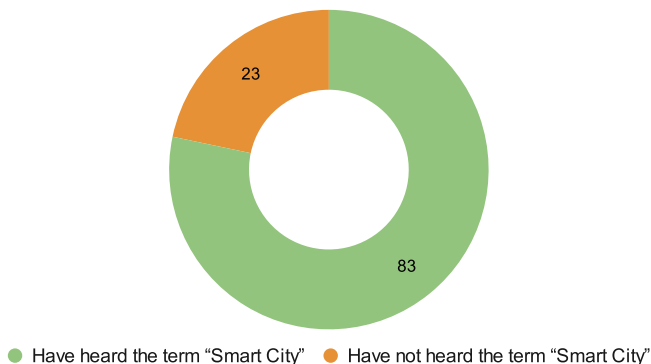


Figure 3. Familiarity with “smart city” term in Phnom Penh.



Participants that were familiar with the “smart city” term (“familiar” category) were asked to express their opinion on the importance of several concepts, such as Urban Mobility, Sustainable Development, ICT, Energy Efficiency, Citizens’ Involvement, and Modern Management – correlating with the smart city concept (“*To what extent do you believe that the following options correlate with the smart city concept?*”).

- Generally, the participants acknowledged the fact that all options given are of high importance for the development of a smart city; thus, “Not important” and “Less important” options gathered an insignificant percentage amount.

- The results also showed that the two options that gathered the highest percentages of “Very important” responses were the “Sustainable Development” option (65.6 per cent of the participants opted for “Very important”) and the “Information and Communications Technology (ICT)” option (63.3 per cent of the participants opted for “Very important”) for Jakarta youth.
- For Phnom Penh youth, “Citizens’ Involvement” gathered the highest percentage of “Very important” responses (70.8 per cent of the participants opted for “Very important”).

Figure 4. Importance of sectors in Jakarta.

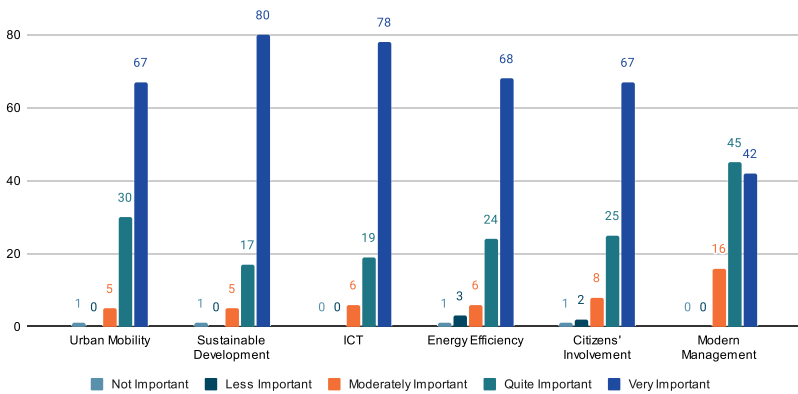
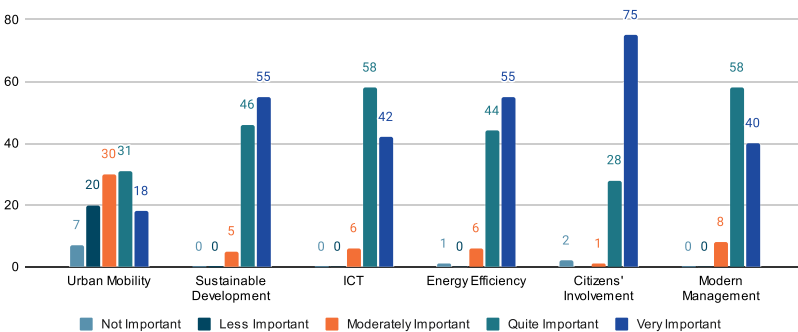


Figure 5. Importance of sectors in Phnom Penh.



109 Jakarta youth and 83 Phnom Penh youth that were already familiar with the term “smart city” were asked whether there had been efforts made to transform the city they live in to become a smart city. (“Do you think that efforts have been made in order for your city to be transformed into a ‘Smart City?’”)

- 83 Jakarta youth (76.14 per cent) believed that efforts had been made to transform Jakarta into a smart city, 5 (4.58 per cent) answered that no effort had been made, 15 (13.7 per cent) answered that they did not know, and 6 (5.5 per cent) participants did not answer.
- 71 Phnom Penh youth (85.54 per cent) believed that efforts had been made to transform Phnom Penh into a smart city, 9 answered that no effort had been made, and 3 answered that they did not know.

Figure 6. Efforts to transform Jakarta into a smart city.

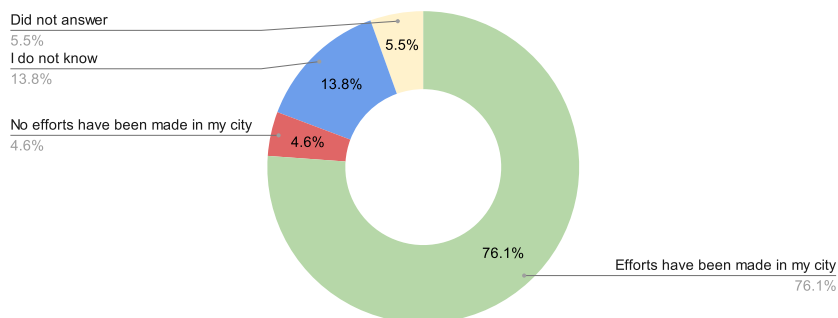
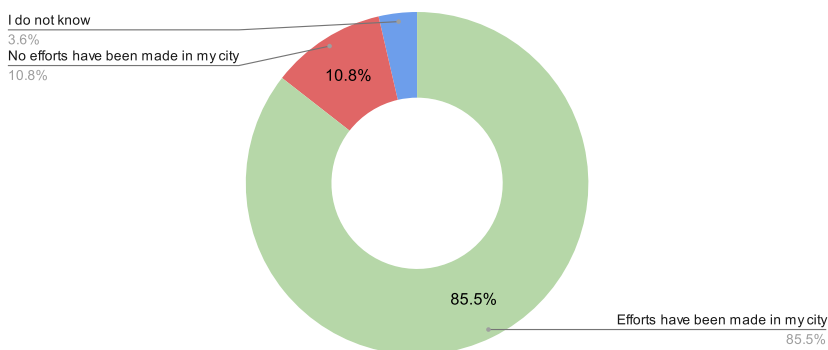


Figure 7. Efforts to transform Phnom Penh into a smart city.



Participants who believed that efforts had been made to transform their city into a smart city were asked in which sector they noticed any kind of activity (*"In which of the following sectors have you noticed any kind of activity?"*)

- In Jakarta, based on the replies, all options were chosen, by a quite substantial percentage. The most popular choices were "Urban Mobility" (chosen by 66 out of the 83 participants, a number which corresponds to 79.51 per cent) and "Governance" (chosen by 52 out of the 83 participants, a number which corresponds to 62.6 per cent). The least popular option was the "Living" option (19, corresponding to 22.9 per cent).
- In Phnom Penh, the most popular choice was "Economy" (chosen by 55 out of 71 participants). The less popular options were "Environment" and "Governance" (both chosen by 24 out of 71 participants). This means that most of the youth in Phnom Penh have not yet noticed activities in the environment and governance sectors to transform Phnom Penh into a smart city.

Based on the survey, Jakarta and Phnom Penh youth generally perceive that all pillars of the smart city model need improvement in the city they live in. (*"In which of the following areas do you think improvements need to be made in the city where you live?"*)

- The results revealed that, in general, each option has been chosen by the participants with a relatively high percentage, except the "Mobility" sector (only chosen by 42 out of 109 participants in Jakarta, and 51 out of 83 participants in Phnom Penh – participants can choose more than one option), which means that most of the participants feel that this sector does not need further improvement.
- Typically, the most popular options chosen by the participants in Jakarta were "Environment" (chosen by 66 out of 109 participants) and "Living" (chosen by 72 out of 109 participants). The results are shown in Figure 4.
- In Phnom Penh, the most popular options chosen were "Environment" (chosen by 59 out of 83 participants), followed by "Governance" (chosen by 55 out of 83 participants).

The last question for participants who were familiar with the term “smart city” was to evaluate the six smart city pillars based on their importance. The participants were asked to choose among the following responses for each option: “Not important at all”, “Less important”, “Moderately important”, “Quite important” and “Very important”.

- The results revealed once again that the participants were generally aware of each pillar’s high importance.
- For Jakarta youth, the most popular options deemed as “Quite Important” and “Very Important” were “Smart Mobility” (90.8 per cent) and “Smart Environment” (90.8 per cent).
- In contrast to the results in Jakarta, the results in Phnom Penh revealed that the participants were generally aware of each one of the pillars’ high importance, except “Smart Mobility”. This is shown by the fact that the “Quite important” and “Very important” choices combined exceeded the 75 per cent mark for each of the five pillars provided, except “Smart Mobility”. The most popular option deemed as “Important” and “Very important” was “Smart Governance” (93 per cent).

Table 1. Importance of smart city pillars in Jakarta.

| | Smart Governance | Smart Environment | Smart Living | Smart People | Smart Economy | Smart Mobility |
|-----------------------------|------------------|-------------------|---------------|---------------|---------------|----------------|
| Not Important | 0.9 per cent | 0.0 per cent | 0.0 per cent | 0.9 per cent | 0.9 per cent | 0.0 per cent |
| Less Important | 0.9 per cent | 0.0 per cent | 0.9 per cent | 0.0 per cent | 0.0 per cent | 0.9 per cent |
| Moderately Important | 2.8 per cent | 2.8 per cent | 5.5 per cent | 6.4 per cent | 7.3 per cent | 2.8 per cent |
| Quite Important | 22.9 per cent | 23.9 per cent | 33.0 per cent | 16.5 per cent | 29.4 per cent | 20.2 per cent |
| Very Important | 67.0 per cent | 67.0 per cent | 55.0 per cent | 70.6 per cent | 56.9 per cent | 70.6 per cent |

Table 2. Importance of smart city pillars in Phnom Penh.

| | Smart Governance | Smart Environment | Smart Living | Smart People | Smart Economy | Smart Mobility |
|-----------------------------|------------------------|-----------------------|---------------|---------------|---------------|----------------|
| Not Important | 0.0 per cent | 0.0 per cent | 0.0 per cent | 0.0 per cent | 0.9 per cent | 0.0 per cent |
| Less Important | 0.0 per cent | 1.2 per cent | 0.0 per cent | 0.0 per cent | 0.0 per cent | 7.2 per cent |
| Moderately Important | 0.0 per cent | 7.2 per cent per cent | 9.6 per cent | 7.2 per cent | 7.3 per cent | 31.3 per cent |
| Quite Important | 39.7 per cent per cent | 38.5 per cent | 53.0 per cent | 44.5 per cent | 29.4 per cent | 42.1 per cent |
| Very Important | 54.2 per cent | 53.0 per cent | 37.3 per cent | 48.1 per cent | 56.9 per cent | 19.2 per cent |

Besides respondents who were familiar with the “smart city” term, we also present responses from participants that reported unfamiliarity with the “smart city” term (“non-familiar”). At the beginning, the participants were asked if they were willing to learn more about the smart city concept in the future so that they could understand the term better. All of the participants from Jakarta (11) responded that they would like to learn more about the concept, and only 1 out of the 23 (4.34 per cent) participants from Phnom Penh reported that they would not want to learn more. Then the participants were further asked whether they thought local authorities in their city had taken initiatives to inform them about the smart city concept. The results have shown that in Jakarta, four respondents answered “Yes” (36.36 per cent), two participants (18.18 per cent) claimed that they did not think that the local authority had taken initiatives to inform them about the smart city concept, and the other respondents (45.45 per cent) showed unawareness on the subject.

Figure 8. Initiatives to inform about smart city concept in Jakarta.

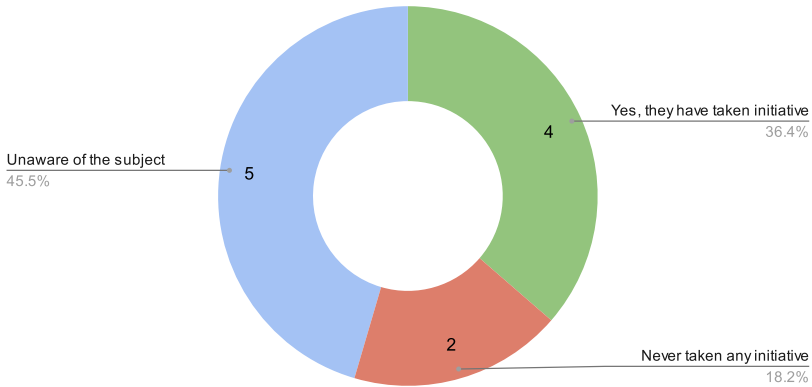
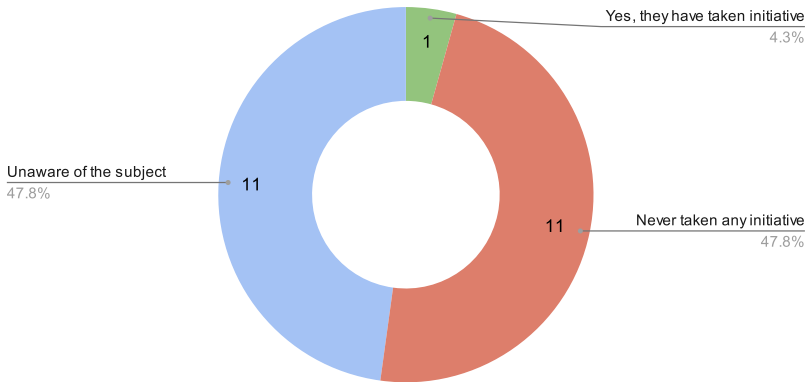


Figure 9. Initiatives to inform about smart city concept in Phnom Penh.



These findings are different from those in Phnom Penh, where half (47.82 per cent) of the non-familiar participants reported that they did not think that the local authorities had taken any initiative to inform them about the concept of smart city; the other half (47.82 per cent) answered that they were not familiar with the subject; and only one respondent (4.34 per cent) acknowledged that the local authority had taken initiatives to promote the concept.

Lastly, non-familiar participants were asked whether they would be willing to participate in the decision-making for the development of their city via a digital platform. The vast majority of these participants in Jakarta (8 out

of 11, or 72.72 per cent) and Phnom Penh (15 out of 23, or 65.21 per cent) answered “Yes”; two participants from Jakarta and eight participants from Phnom Penh did not appear to be sure; and one participant from Jakarta showed no interest in taking part in decisions for projects related to their city.

Figure 10. Willingness to participate in decision-making in Jakarta.

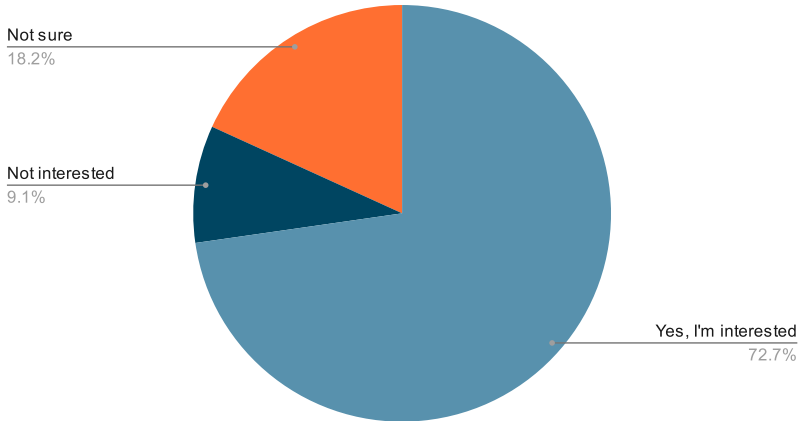
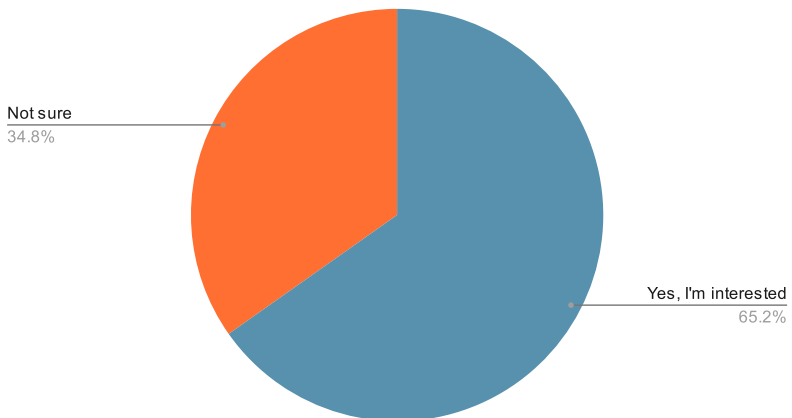


Figure 11. Willingness to participate in decision-making in Phnom Penh.



The respondents were also asked to choose from among five options (Public-private partnership, Citizens' involvement, Transparency in the decisions of municipal authorities, Business expansion, Other), what they believed to constitute the biggest challenges for the development of a smart city. Respondents were allowed to choose more than one option. Respondents might add an open-ended answer if their opinion was not included in the five options. It was found that in Jakarta, the youth perceived that "Citizens' involvement" was the most important challenge, chosen by 80 participants out of the 122 participants (65.6 per cent) in the "familiar" category, followed by "Transparency in the decisions of municipal authorities" (71 participants, 58.2 per cent). Similarly, for Phnom Penh's youth, "Citizens' involvement" was also chosen by most of the participants (74.5 per cent, or 79 out of 106 participants), followed by "Transparency in the decisions of municipal authorities" (56.6 per cent or 60 out of 106 participants).

Figure 12. The biggest challenge of developing a smart city in Jakarta.

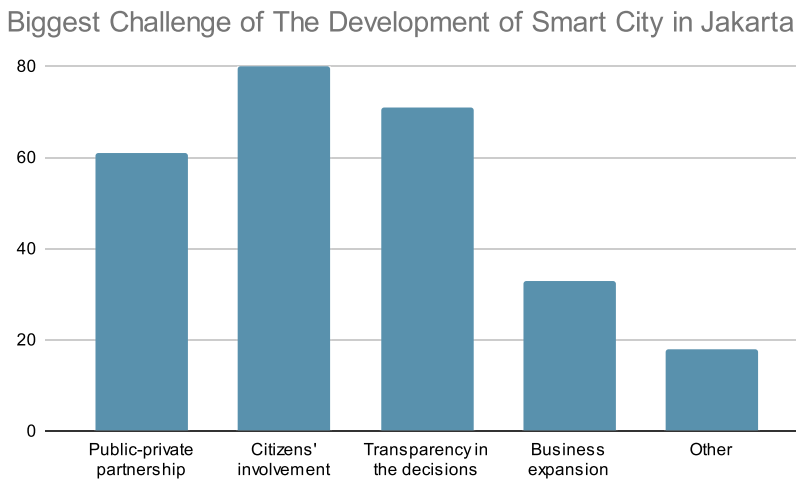
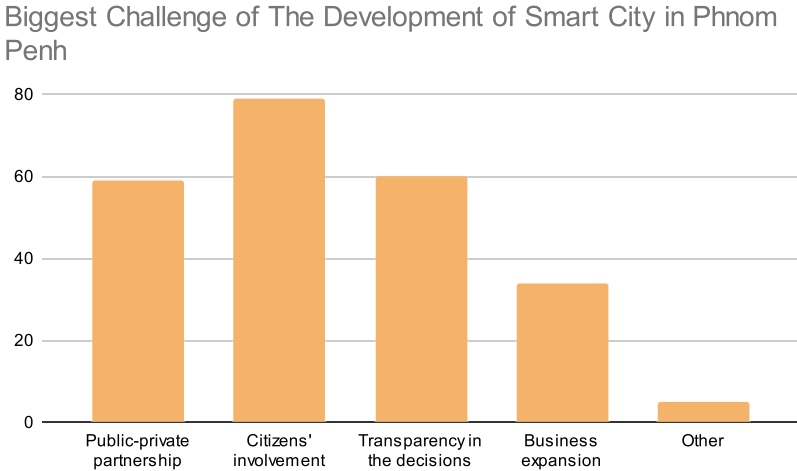


Figure 13. The biggest challenge of developing a smart city in Phnom Penh.



For the open-ended question, most of the answers from the youth in both cities concerned the readiness of the people with respect to digital transformation – especially the readiness of the digital illiterate. Other challenges reported were: engagement of a smart city's users, security of the data, ensuring the accessibility of the internet, and local authorities' capacity to plan and deliver smart city projects, including the financing aspect.

POLICY RECOMMENDATIONS

- Although ASCN allows member cities to prioritise areas that matter and are in line with each city's local and cultural context, the findings from this survey show that the youth in both Jakarta and Phnom Penh generally chose the "Smart Environment" aspect as being the most important and that needed improvement. It is regarded as the most crucial aspect and requires advancement since it is perceived that there are still fewer measures implemented to tackle the environmental challenges compared to the other smart city dimensions. Future smart city projects should focus on smart environment measures, such as responsible resource management, sustainable urban planning, pollution reduction, emissions control, and promotion of the use of renewable energy, for example.
- Since "Citizens' Involvement" is believed by the youth in both cities to be the biggest challenge for the development of a smart city, local authorities should provide an enabling environment through the implementation of an accessible digital platform, such as an application, a website, or a focus group discussion, to incorporate youth aspirations and concerns, as they are one of the beneficiaries of smart city projects.
- There is a need to involve more youth in the development of a smart city project, especially youth who are still unfamiliar with the "smart city" term and are willing to participate in the decision-making since most of the youth in the unfamiliar group are willing to learn more.
- There is a need to inform more youth about the products or services of a smart city through branding and marketing placements, since the general citizens should be aware of and obtain the benefits from the smart city initiative in order to improve their lives. Targeting youth users would be more strategic due to their role in supporting elderly family members to adapt to digital transformation; for example, in accessing "Smart Mobility" projects in the city they live in, locating public transportation vehicles or buying tickets through mobile applications.
- Local authorities should utilise the shared partnership within ASCN and other cities, such as cities in the European Union (EU), in order to share best practices and pool knowledge, build collaborations, and access important resources for smart city development, including potential invest-

ments in regard to infrastructure and capacity building, and monitoring and evaluation tools. For example, the Smart Change initiative by Jakarta and Berlin on the development of a supportive entrepreneurship ecosystem.¹³ Another example is the partnership initiative that has been established between the EU and ASEAN through the Smart Green ASEAN Cities Programme, launched in October 2021.¹⁴

CONCLUSION

It is shown from the study that most youth respondents in Jakarta and Phnom Penh were already familiar with the term “smart city” and had seen efforts in their respective cities to transform into smart cities. Adopting the research conducted by Georgiadis et al. (2019) and evaluating the results based on the Smart City Model by Giffinger et al., (2007), it was reported that the “Smart Environment” dimension needed further improvement. In the Jakarta context, “Smart Mobility” and “Smart Environment” are believed to be the most important pillars, and in Phnom Penh, the majority chose “Smart Governance” as essential. As pilot project cities of the ASEAN Smart Cities Network, collaboration on the design and implementation of smart city initiatives, especially with the youth audience, will help authorities to understand and incorporate the needs of various stakeholders, and instil a greater sense of ownership and stewardship of smart city projects. In turn, the development of smart cities in Jakarta and Phnom Penh contributes to achieving the Sustainable Development Goals in Indonesia and Cambodia, particularly Goal 11 (Sustainable Cities and Communities).

13. BGZ. 2019. Smart Change – Strengthening Urban Governance, Prosperity and Innovation in Jakarta. (<https://www.bgz-berlin.de/en/projects-and-products/project-overview/smart-change/>).

14. Delegation of the EU to ASEAN. 2022. EU-ASEAN Blue Book 2022. (https://www.eeas.europa.eu/delegations/association-southeast-asian-nations-asean/eu-asean-blue-book-2022_en?s=47).

07

Reorienting Smart City

Proposals to Rebuild
Alternative Smart Cities in
the EU and ASEAN

Fernando A. T. Ximenes

Abstract

This paper aims to critically re-examine the “actual existing smart cities” initiative in both the EU and ASEAN regions. To discuss and expose its association with the neoliberal ideology, this paper intends to discuss the actual limitation and the paradox of smart city initiatives in the EU and ASEAN, which were dominated by the narrative of technocracy, the market economy and elitism, designed to attract global capital and to incorporate the respective cities into the capitalist global economy. Here, I found that the creation of smart city initiatives in both the EU and ASEAN regions was the result of states seeking a “place-specific” economy to promote economic growth, implement its development strategy, and foster competition, which in turn, reinforce the corporatisation, marketisation and privatisation of space. In addition, neoliberal austerity forced states to allow the corporates to define and direct urban restructuring, including the smart city initiatives in both regions, and even though smart cities promised technosolutionism, entrepreneurship and competition, they only exacerbate the existing unevenness and perpetuate zero-sum games that persist in most of the EU and ASEAN capital cities, including in the smart city areas. At the end of the paper, I will put forward five proposals to change the direction of smart cities development onto a more just, democratic and egalitarian path – smart cities that serve the people and the planet rather than function as a source of profits for the capitalists, technocrats and elites in the EU and ASEAN.

1. INTRODUCTION

The idea of smart city has penetrated state policies, corporate governance, academic discourse and grassroots initiatives, aiming to reimagine, transform and reconfigure urban spaces for enhanced growth, competition, and sustainability. The smart city vision promises a city that is liveable and eco-friendly, with techno-automatism and smartness.

Until now, smart city literatures have been dominated by euro-centric bias, and the engagement of smart city issues outside of the Global North has been substantially lacking. This include a lack of depth in empirical and critical-oriented scholarship, with the predominant views tending to present the concept as a non-ideological idea, more aligned with pragmatic or instrumental reasons.¹ For us, a policy initiative pertaining to the city is always a social and political product; therefore, space contains politics and ideology, and is a realm of domination and strategic social struggle.

Therefore, here, we propose to elaborate in deep and critical orientations regarding the concept and model of smart cities. This paper proposes to rethink the smart cities in both the European Union (EU) and Association of Southeast Asian Nations (ASEAN) and, again, to offer a new proposal to rebuild new smart cities that can follow a more egalitarian, just and democratic path. From this, we could reformulate and reorient smart city policies so that they serve the social needs of the people living in the cities rather than the maxim of profit-oriented, techno-utopian and top-down productivist models that currently dominate the policies and knowledge of smart city building in both regions.

This paper is divided into three sections: (i) the first section will discuss the concept of smart city as an ideology, as the expression of our evolving globalised neoliberal financial capitalism; (ii) the second section will examine, contrast, and discuss the patterns and processes of smart cities in both the EU and ASEAN, offering a critique on the “actual existing smart cities” in both regions, centred on the neoliberal ideology; and (iii) the third section

1. Burns, Ryan, Fast, Victoria, Levenda, Anthony, and Miller, Byron. 2021. Smart cities: Between worlding and provincialising. *Urban Studies*, 58(3), 461-470. (<https://doi.org/10.1177/0042098020975982>).

presents proposals to rebuild a new smart cities vision and orientation that follows a more egalitarian, democratic and just path.

2. SMART CITIES: TECHNO-UTOPIAN, NEOLIBERAL FINANCIALISATION OF THE ECONOMY AND CITIZENSHIP

There are varying, different, and contradicting models of smart cities for both regions, and between countries of the two regions. As such, smart cities display a variety of models and orientation across the countries of the world, especially in both the EU and ASEAN. However, for us, the implementation of any progressive policy that is oriented toward the development of people-centred and people-led smart cities shall begin with the theoretical and critical re-examination of the pre-existing model, concept, and policies-orientation of smart cities. In order to examine the three aspects of the driving forces related to the development of smart cities as an ideology, state public policies and the strategic model of the corporate- and market-led reconfiguration of the city, here, I briefly discuss the three main elements determining smart city orientations: first, techno-centrism approach; second, neoliberal financialisation; and third, neoliberal citizenship discourse.

First, techno-centrism approach: based on conventional wisdom, smart city as a model of city development and its knowledgeable discourse has spread widely in the academic, civil society, government and business sectors during the last few decades. It is also coupled with the so-called triumph of technology and digitalisation as well as the artificial intelligence (AI) revolution. The dominant view holds and welcomes the existing model of smart cities with a persuasive, optimistic and celebratory attitude. For instance, the concept and model of smart cities promises “interconnections, intelligence and instrumentalisation”, in which the utilisation of technology, big data and policy innovations will improve the quality of life, sustainability and inclusion.² With the use of advanced hardware, devices, computing systems and

2. IBM. 2013. IBM Smarter Cities Challenge: Challenges and Cities. Accessed 1 October 2022. Available online at: ([http:// smartercitieschallenge.org/smarter-cities.html](http://smartercitieschallenge.org/smarter-cities.html)).

big data in the city for management and services, the city can be turned into a smarter form of urbanism, run by smart citizens and smart businesses, where the three elements of smart cities, smart technology, smart citizen and smart collaboration, will coincide and grow for the benefit of citizens and capitalist businesses.³

Therefore, smart city research has increased rapidly and covers various themes and issues, such as the necessity to protect citizens' privacy from increasing digitalisation in the smart city,⁴ with some researchers proposing the need to integrate a long-term vision of architectural evolution within the deployment of smart city systems,⁵ on tax issues,⁶ traffic,⁷ industry,⁸ and so on. This all goes to show the neoliberalisation of the economy, coupled with the digitalisation of society, in which the idea of a smart city is consistent with the techno-productivist aspiration.

Therefore, the dominant narrative of smart cities was associated with the vision of technological-driven changes, innovations and entrepreneurship.⁹ In this first position, it is advocated that technological advancements alone can solve the social challenges faced by the people as well as urban problems. This dominant paradigm of technical solutionism believes that urban

3. Meijer, Albert and Bolívar, Manuel. 2016. Governing the smart city: a review of the literature on smart urban governance. *International Review of Administrative Sciences*, 82(2), 392–408. (<https://doi.org/10.1177/0020852314564308>).

4. Martínez-Balleste, Antoni, Pérez-Martínez, Pablo and Solanas. 2013. The pursuit of citizens' privacy: a privacy-aware smart city is possible. *IEEE Communications Magazine*, vol. 51, no. 6, pp. 136–141. (doi: 10.1109/MCOM.2013.6525606).

5. Mulligan, Catherine and Olsson, Magnus. 2013. Architectural implications of smart city business models: an evolutionary perspective. *IEEE Communications Magazine*, vol. 51, no. 6, pp. 80–85. (doi:10.1109/MCOM.2013.6525599).

6. Zou, Qingnan, Xue, Guangtao, Luo, Yuan, Yu, Jiadi and Zhu, Hongzhi. 2013. A Novel Taxi Dispatch System for Smart City. In: Streitz, N., Stephanidis, C. (eds.). *Distributed, Ambient, and Pervasive Interactions*. DAPI 2013. *Lecture Notes in Computer Science*, vol. 8028. Springer, Berlin, Heidelberg. (https://doi.org/10.1007/978-3-642-39351-8_36).

7. Galan-García, Jose, Aguilera-Venegas, Gabriel, and Rodrigues-Cielos, Pedro. 2014. An accelerated-time simulation for traffic flow in a smart city. *J. Comput. Appl. Math.* 270: 557–563.

8. Bronstein, Zelda. 2009. Industry and the smart city. *Dissent* 56: 27 - 34.

9. See Kourtit, Karima, Nijkamp, Peter, and Arribas-Bel, Danie. 2012. Smart cities perspective – A comparative European study by means of self-organizing maps, *Innovation*, 25: 229–246.

problems can be solved in a mechanical and programmatic manner. However, this has led us to see that a smart city is equivalent to what Rob Kitchin has called “programmable urbanism”, in which “how cities are translated into code” and “how codes reshapes city life” may be examined.¹⁰ Tragically, this so-called techno-enabled development model of smart cities, which aims to redesign the structure, organisation, and spatial management of city life into a “constellation of computers”, really has limitations.¹¹ We are not proposing techno-scepticism; however, techno-optimism under the framework of neoliberalism will not really lead us to democracy, freedom and autonomy; instead, it will lead to more insanity.

Second, neoliberal financialisation-led urban transformation: we shall not deal with the first aspect, such as technical solutions or techno-centric orientations, in an isolated way; instead, we shall situate its historical role in the development of the world system that is dominating our era, known as financialised neoliberal economy. The smart city is a concept and model representing a particular ideology and development of the world economic system that affects and reconfigures the urban environment and cities across the globe. That is to say, we contemplate that smart cities are an extension of the neoliberal financialisation of the global economy that took place in cities. For instance, the devices of market transactions, commuting or location-awareness are owned and powered by trans-national digital-financial corporations such as Google, Grab or Amazon. A smart city should not be envisioned as simply promoting interconnections, mobility, and liveability but also as an instrument for market reform, deepening competitiveness, businesses, and, for certain, more digitalisation and financialisation of the economy, which, again, shall certainly bring wealth-drain and deindustrialisation to the people of the Global South, and unemployment to both the North and the South regions.¹²

10. Kitchin, Rob. 2011. The Programmable City. *Environment and Planning B: Planning and Design*, 38(6), 945–951. (<https://doi.org/10.1068/b3806com>).

11. Batty, Michael. 1995. The computable city. *International Planning Studies*, 173. (<https://doi.org/10.1080/13563479708721676>).

12. See Caragliu, Andrea, Del Bo, Chiara, Nijkamp, Peter. 2009. *Smart Cities in Europe*. Series Research Memoranda 0048. VU University Amsterdam, Amsterdam, Faculty of Economics, Business Administration and Econometrics.

Many prominent and critical works have examined the neoliberal financialised market-led restructuring of urbanity across the world. Authors such as Brenner and Theodore¹³ and Hollands¹⁴ have provided in-depth explanatory and critical examinations of how neoliberal-market-led urban transformation and smart cities were part of this global shift. The proliferation of individualist and entrepreneur spirits was prominent in the smart city model and orientation, leading to critical geographer theorist David Harvey considering a smart city as meaning an “entrepreneurial city”.¹⁵ In addition, the neoliberalisation process of designing smart cities is fully expressed when we conceive of a pertinent model of a smart city in which private-public partnership is encouraged, and in which corporate power is allowed to redefine the rules of the game and the market orientation of the smart city. Thus, smart cities are nothing but an ideological expression that can only lead to the creation of what Hollands¹⁶ has called a “corporate smart city”.

Therefore, be it central state or local governance or a supra-national entity directing smart city initiatives, it has been shown that the predominant role of a smart city as the promoter of privatisation, corporate interests, business elites and entrepreneurs was an integral process of neoliberal financial-driven development in the smart city. In a tragic way, the smart city does not lead to equality but to more division and disparity instead, and to the prioritisation of economic profits over social necessity, all of which give us all the actual existing smart cities.

Third, civilising mission of neoliberal smart citizenship: The smart city initiatives in the EU and ASEAN may rhetorically place citizens’ participation as their core target, but the dominant narrative and objectives of smart cities

13. Brenner, Neil and Theodore, Nik. 2002. From the ‘new localism’ to the spaces of neoliberalism. In Brenner, Neil and Theodore, Nik (eds.). *Spaces of neoliberalism: Urban restructuring in North America and Western Europe*. Oxford: Blackwell. Also see Brenner, Neil and Theodore, Nik. 2002. Cities and the geographies of “actually existing neoliberalism”. *Antipode*, 34(3), 349–379.

14. Hollands, Robert. 2008. Will the real smart city please stand up? Intelligent, progressive or entrepreneurial?. *City*, 12(3), 303–320.

15. Harvey, David. 1989. From Managerialism to Entrepreneurialism: The Transformation in Urban Governance in Late Capitalism. *Geografiska Annaler: Series B, Human Geography*, 71:1, 3–17. (doi: 10.1080/04353684.1989.11879583).

16. Hollands, Robert. 2015. Critical interventions into the corporate smart city. *Cambridge Journal of Regions, Economy and Society*, 8(1), 61–77.

in the EU and ASEAN can be conceptually described as a civilising mission of neoliberal citizenship. The smart cities in Europe and ASEAN envision citizens as “learners” that need educating and civilising in order to adapt to and better use technology. These so-called “nudging behaviours”¹⁷ are becoming the representative of the EU-ASEAN rhetoric and narrative on smart cities, cities that are filled with magnificent smart citizens who obey the commands of neoliberal governmentality. However, the problem as underlined before is the top-down paternalistic stewardship of technological-led neoliberal city-making and subject creation. However, the case is not simply about the neoliberal-led urban growth in smart cities, which subjects citizens to passivity; it is far more than that.

The ideology of neoliberalism embedded within the existing smart city concept in the EU and ASEAN has been reinventing the citizens according to the market logic of consumers-buyers and sellers-producers relationships. The citizens are reframed into the capital-state relations or the principles of the market economy. As Wendy Brown¹⁸ argues, “[n]eoliberalism construes subjects as market actors everywhere, but in which roles – Entrepreneur? Investor? Consumer? Worker?”, and, with all these, antagonist agents and social relations of hierarchy, subordination and exploitation are reproduced and reinforced.

These neoliberal conceptions of citizens are predominant in smart city discourses, even of what the EU and ASEAN have defined as people-centred or community-led smart city initiatives. Thus, the citizens are reframed as collective data-generated value and profits for the speculative market but also as raw material and consumers at the same time. Even though both the EU and ASEAN have clearly set the goals of smart cities based on a primarily citizen-centric approach to city development, market-centricity and its maxim of profit-making and wealth accumulation for the few are the primary driving forces in shaping and determining the direction of smart city development in both the EU and ASEAN. Thus, the digital-enabled development of smart cities in both regions allow corporations and markets to have more

17. Gandy, Oscar and Nemorin, Selena. 2018. Toward a political economy of nudge: smart city variations. *Information, Communication & Society* 22: 2112 - 2126.

18. Brown, Wendy. 2016. Sacrificial citizenship: Neoliberalism, human capital, and austerity politics. *Constellations* 23(1): 3–14.

penetrative power to organise the everyday life of citizens than before, for monitoring and changing attitudes and desires according to the market logic of profit-maximisation and wealth accumulation. The result is that citizen participation and education is consistent with the principles of control and discipline, but, importantly, the holy trinity: marketisation, privatisation and commodification.

Hence, to elaborate on these three ideas, smart cities are defined generally as the utilisation of the neoliberal-financialised ideology to stimulate economic development and urban planning through the application of techno-centric information and communications technology (ICTs) for urban utilities, life improvement, services and safety.¹⁹ The main ideas are techno-, digital- and data-centric visions of the programmes, models and infrastructures that aim at providing opportunities for better lives, an ecological and friendly environment, but, more importantly, a culture of a neoliberal market in the business and investment conditions and competitiveness of the city, reintegrating and reorganising the city in the global market economy; hence, ultimately, reinforcing the marketisation, corporatisation and commodification of space, time and real-life economy and society in the cities of both regions.

Thus, these techno-utopian/optimist, neoliberal financialisation and neoliberal citizenships were first viewed as a utopia but is, in fact, an ideology par excellence. Thus, “smart city” as a development model was the ideological expression of a techno-utopian ideology, and is part of a neoliberal financialisation campaign to pacify, control, and extract more profits from the majority masses for the national and global ruling class, and to reengineer the citizens’ imaginations and attitudes by distracting the citizens from being involved in the real social struggles and democratic transformation of the cities. For decades, the techno-optimistic advocator and neoliberal financial clichés have claimed that we have entered, and enjoyed the consequent wealth and progress of, the era of productivity, creativity and innovations, but in fact, the actual picture was more distorted. The successful history of innovation and progress has blurred and obscured the real situations, in which progress is equally accompanied by regression, democratic reforms are followed by mass surveillance and control, liberty with isolated, alien-

19. Kitchin, Rob. 2014. The Real-Time City? Big Data and Smart Urbanism. *GeoJournal* 79, no. 1 (2014): 1–14. (<http://www.jstor.org/stable/24432611>).

ated and conforming individuals, wealth is substituted with poverty, and the proclamation of the dawn of mass productivity is faced with the consistent unemployment in the smart cities in both the EU and ASEAN.

3. A METHOD: FROM THE PERIPHERAL POINT OF VIEW

I approached the smart city issues from the perspective of a critical urban study, inspired by the dialectical materialist approach of Henri Lefebvre to study everyday life, urban inequality, politics of a city and the production and reproduction of space. From him, we learn to approach the urban space and the city from the peripheral point of view, the marginal and subaltern position, to examine how they encounter modernity, technological development, and the hegemony of the state and capital, and how the marginal people resist. The peripheral point of view is not what the conventional wisdom suggests, but rather, “[t]he concept of ‘periphery’ is not related to a shift in space, a measure of distance or nearness to a spot defined as ‘centre,’ but it is, above all, a point of view that redefines radically the glance over the remaining urban space”.²⁰ Those who are part of a particular space but do not belong, are non-counted, and are under-represented – their voices are being obscured and they are forced to be silent creatures.

The work of Henri Lefebvre is important, central to the basis of my analysis of smart city initiatives, to situate the patterns and processes of smart cities into the rhythm of globalisation and power restructuring in cities. Therefore, this study aims to critically examine the model and direction of the actual existing smart cities from the point of view of the periphery. With this perspective, we can really identify the distortion and border between contradicting visions, between those who are wealthy and those who are poor, between the ruling and the subjugated people in the narrative of the smart city – what does the smart city really mean to those who possess ruling economic-political power and to those who are marginal and subjugated?

20. Biagi, Francesco. 2020. Henri Lefebvre's Urban Critical Theory: Rethinking the City against Capitalism. *International Critical Thought*, 10:2, 214-231. (doi:10.1080/21598282.2020.1783693).

Therefore, it is important to examine the actual existing smart cities from the point of view of the weaker groups – from the miserable, poor, marginalised and exploited people, such as migrants, workers and so on.

4. THE MODEL OF EU-ASEAN SMART CITY INITIATIVES: A CRITIQUE

Before I move into more details on how neoliberalism has been the main ideological force driving the public policies in the creation of smart cities in the EU and ASEAN, and the various initiatives from smart city agents, let us first describe briefly the development of smart city initiatives in the EU and ASEAN.

At the official supra-national level, the EU has adopted an ambitious and comprehensive smart cities project known recently as Smart Cities Marketplace. As a combination of the previous “Marketplace of the European Innovation Partnership on Smart Cities and Communities (EIP-SCC Marketplace)” and the “Smart Cities Information System (SCIS)”, it aims “to bring cities, industries, SMEs, investors, banks, researchers and many other smart city actors together”.

Similarly, in ASEAN, the 32nd ASEAN Summit in 2018 established the ASEAN Smart Cities Network (ASCN) as a “collaborative platform where cities from the ten ASEAN Member States (AMS) work towards the common goal of smart and sustainable urban development”. The primary aim of the ASCN is to “improve the lives of ASEAN citizens, using technology as an enabler (...) [F]ocusing on people, it adopts an inclusive approach to smart city development that is respectful of human rights (...) and enhancing mutual understanding across cultures”.

Until now, the EU has developed and implemented more than 80 projects across the EU countries, while in ASEAN, under the ASCN platform, 26 pilot projects were launched during the early period and now there are more than 50 smart city initiatives in the Southeast Asia region. There are more than 250 cities in Europe that are making progress toward becoming smart cities, most of which are in the Nordic states, and countries such as France, Italy, Austria, Holland, Spain and the United Kingdom have more smart city initiatives than Germany.

In ASEAN, as with the EU, smart city initiatives do not only integrate into the framework of regional economic planning, but are also part of national economic development strategies – for instance, in Kuala Lumpur, the smart city initiative related to the traffic management system was part of Malaysia’s National Key Economic Areas of the Economic Transformation Programme (ETP). In Thailand, the smart city initiative was part of the national ambition to transform the country into a developed high-income country in the future. The Thai government launched the first smart city project in Phuket in 2016, followed by Chiang Mai and Koon Khaen in 2017. These smart city initiatives were part of the Thailand 4.0 initiative and Thailand’s Eastern Economic Corridor (EEC) plan of economic strategy.²¹

The EU is in a temperate zone, while ASEAN is in a humid tropical zone, but both regions nevertheless share a common concern and vision regarding the model and orientations of smart cities. The dominant sectors and issues that have gained much attention from the respective states and private investment communities in the smart city infrastructural aspects are energy, transport, telecommunication, sanitation, waste, resilience and water, while on social issues, they are climate change, inclusion, safety, education and civic engagement, as well as economic growth, data, policy and regulations issues.

These are the common issues and infrastructures that use smart digital technologies. The rhetoric of smart solutionism is also predominant in both the EU and ASEAN, accompanied by a similarly strong techno-utopianist vision and the associated directions. For instance, in Europe, there is a so-called The Green Network that promotes responsible energy markets and sustainable use and consumption of energy and so on. It is the same with the experiences of ASEAN, especially Singapore, where the Hitachi enterprise has been commissioned by the Singapore Building and Construction Authority to develop a smart digital platform called “Super Low Energy Programme”, as part of Singapore’s commitment to tackling climate change and contributing to a carbon-free society. These two examples show the commitment toward technological-centric approaches in addressing urban problems but

21. The ASEAN Post Team .2018. Thailand’s smart cities to herald in Thailand 4.0. The ASEAN Post, 4 March 2018. (<https://theaseanpost.com/article/thailands-smart-cities-herald-thailand-40>).

are also a sign of the neoliberal transfer of the public domain of services to private companies, allowing the marketisation of public service provision.²² A closer examination of the directions of this techno-centric and neoliberal approach is needed to uncover how it has shaped the smart city building and discourse in both regions.

The following are the two aspects that link the technological-led neoliberal smart city building in both regions, and are intended to demonstrate how neoliberalism was the means and the end of smart city development. The two aspects that we will discuss are as follows: statehood rescaling and neoliberal market strategy; and the unevenness and asymmetrical relations of smart cities within and between the ASEAN and the EU regions.

4.1. Statehood Rescaling and Neoliberal Market Strategy

Smart cities emerged and were promoted at the local, national, regional and international levels during the period in which states sought a place-specific economy for growth, development strategy and policies to attract international capital. This in turn forced changes in the economic and governmental paradigms, including in urban governance and city-building discourses. The idea of networking characterised these emerging political, economic, academic, and even progressive grassroots discourses. Specifically, the technological language of networking was adapted to the daily strategic vocabulary of the economists and public policymakers either in the government or private sector, both in ASEAN and the EU. It demands a more flexible, diffused, non-hierarchical, horizontal, collaborative, creative and auto-organising approach rather than the old pattern of social-economic organisation based on large-scale concentration and hierarchy, and instead of production, it promotes the services economy.

The smart city initiatives in the EU and ASEAN reflect the ideas of this “rescaling statehood”, in which the Western European states as well as Southeast Asian states reshape their territories in a flexible and multiscalar way in or-

22. Cardullo, Paulo and Kitchin, Rob. 2018. Smart urbanism and smart citizenship: The neoliberal logic of ‘citizen-focused’ smart cities in Europe. *Environment and Planning C: Politics and Space* 37: 813 - 830.

der to transform the scale-specific conditions for growth and competition.²³ Even though national states and their national institutions persist, states in these new stages founded and developed at the level of a complex constellation, including cross-boundary institutions and policy networks. Thus, smart cities shall be understood in the light of this changing organisation of states, and the smart city initiatives in the EU and ASEAN appeared in these historical changes and geographical reorganisations.

And this is to say that smart cities are the result of the increasingly transformed role of the state in reconfiguring and restructuring its own territoriality and spatialisation in order to reinforce and affirm its competitiveness by creating much multi-scalar space for competition, capturing the flow of global capital and, of course, responding to the changing global economy. Especially in Europe, smart cities are the result of how national states and supra-national regimes operate. As inter-city network programmes were fashionable in the EU, it helps in disseminating the neoliberal policies of city reconfiguration.²⁴ And the EU, especially Germany as the principal state, promoted the neoliberal agenda through smart inter-city programmes. This is to show that states within the EU operate in localised sites and multiple scales by inventing the place, reterritorialisation and scaling, forming networks within and across their national and regional boundaries to foster economic growth, competitiveness and creation of markets – thus, smart cities in the EU and ASEAN reflect this restructuring role of the state in redesigning the political scale of the state and the agency of the economy.

However, is there really a community or citizens at the local level that can really steer the direction of policies at the localised sites of smart city initiatives? As we have seen, the smart city is an expression of how the state reshapes its spatial strategy for growth and competition, creating spaces for accumulation and commodification by the economic agency in the market. As a consequence, the neoliberal approach dictates directions from top to down, from supra-national and national states to local governance, to implement the neoliberal policy of urban growth. However, this only leads to varie-

23. Brenner, Neil. 2004. *New State Spaces. Urban Governance and the Rescaling of Statehood*. Oxford: Oxford University Press.

24. See Leitner, Helgar and Sheppard, Eric. 2002. "The City is Dead, Long Live the Net": Harnessing European Interurban Networks for a Neoliberal Agenda. *Antipode*, 34, 495-518.

gated and contradictory results, where the local agency and citizens are not only disengaged, but disempowered, and where the local agency cannot respond and adapt to the demands of national states and supra-national policies, regimes and objectives; thus, at the end, reinforcing a more paradoxical outcome.²⁵ As the recent COVID-19 crisis has shown, the city, as a space with its own authority, is not playing a principal role in the planning and implementation strategy of the EU, and to some extent ASEAN, with regard to their efforts in building a resilient economy and post-pandemic recovery.²⁶ Therefore, the local institutions might take part within the structures and networks of power in forming the scales, and in implementing the projects or policies and regulations of smart cities, and the model of the top-down neoliberal approach dictates that supranational regimes and corporate power reign over and play the most influential and powerful role in the development of smart urbanism and inter-city networking in the EU and ASEAN, not the citizens at the local level or the residents of a city.

To continue, in Europe, core and wealthy cities, such as Paris, Berlin, Brussels, Copenhagen, Vienna, and Naples, or peripheral and semi-peripheral cities, such as Lisbon, Dublin, and Bilbao, are where urban development projects such as smart cities exacerbate social exclusion and economic polarisation, in which the spaces of unevenness of rich and poor divisions were created and reinforced.²⁷ Specifically, from the study of Giuseppe Grossi and Daniela Pianezzi analysing the specific case of the Genoa smart city initiative, which expresses the neoliberal-based smart city utopia, it can be seen that it demonstrates the “aggressive” approach and consequences to the citizens, and we can draw the conclusion that smart city initiatives only serve the interests of the big multinational companies and elitist consumption culture. It shows that the smart city as a concept and development model is a “concrete common utopia” and within it, is underpinned the “neoliberal ideology” of privatisation, marketisation and corporate-led city transformation and devel-

25. See Cardullo and Kitchin. 2018.

26. Eurocities. The Geography of Discontent. Eurocities, 25 March 2022. (<https://eurocities.eu/latest/the-geography-of-discontent/>).

27. Moulaert, Frank, Rodriguez, Arantxa and Swyngedouw, Erik. 2003. *The Globalized City: Economic Restructuring and Social Polarization in European Cities*. London: Oxford University Press.

opment.²⁸ In consequence, smart cities as rhetoric and policy programmes have obscured and diverted attention away from the real problems facing the subaltern people in the cities.

In Southeast Asia, cities such as Makati in the Philippines are considered among the best smart cities in the world with regard to innovation. The Makati smart city follows the idea of building a global city. However, it has been shown that Makati city has reinforced the pre-existing segregation and polarisation, and that, on the other hand, it was a city that marked a civilisational divide. As a corporate city directed by corporate planning, it only served the dominant class, specifically the Manila elite, as a consequence of which this high-modernist luxury city created exclusivity, becoming the elite's enclave and the corporates' citadel.²⁹

On Phuket Island, the Thai government's main objective of the smart city initiative is to improve the tourism sector in terms of public services. This reflects how the largest cities in Southeast Asia are being targeted for smart city initiatives by the ASEAN member states and the case in Thailand clearly illustrates an example of a country in Southeast Asia using the specific-locale for its economic growth strategy.

The services sector is among the major sectors of the economy that are growing extraordinarily in Southeast Asia – the economy is still largely oriented towards non-production economies such as tourism. In addition, it entails the old pattern of a colonial economy based on country or region specialisation. In Thailand, three smart city initiatives are designed for the specific economic task of supporting the country's development strategy. The smart city initiative in Phuket is centred on tourism, with the aim of becoming an international hub. In contrast, for Chiang Mai, the focus is to develop smart agriculture by making use of technology-enabled innovation and productivity, whilst in Khon Kaen, the smart city is designed to serve as a medical and transportation hub, with places to host important events such as exhibitions, conferences, meetings and so on. This all demonstrates an economy centred on specialisation and service-orientation.

28. Grossi, Giuseppe and Pianezzi, Daniela. 2017. Smart cities: Utopia or neoliberal ideology?. *Cities* 69: 79-85.

29. Garrido, Marco. 2013. The Ideology of the Dual City: The Modernist Ethic in the Corporate Development of Makati City, Metro Manila. *International Journal of Urban and Regional Research*, 37, 165-185.

Overall, the space is configured into entertainment and gentrified areas serving the interests of an elites-imposed vision of the city, and the accumulation of capital to the increasingly hedonistic and consumerist social cultures. In this corporate smart city, social and spatial productions mirror the demands of global capital in order to reinforce corporatisation, commodification and homogenisation. These have been the dominant form in the cities, where smart cities are implemented across Europe and Southeast Asia. It all, of course, raises the issues of inclusivity, equality and commitment to pro-people development.

4.2. Austerity, Zero-Sum Game and Unevenness of Smart Cities Between and Within the EU and ASEAN

Hence, the smart cities in the European Union and ASEAN are the product of “world capital”. David Harvey argues that as “urban processes under capitalism are shaped by the logic of capital circulation and accumulation, they in turn shape the conditions and circumstances of capital accumulation at later points in time and space”.³⁰ Here we briefly outline the three elements integral to neoliberalism, and how these are characterised by the real conditions of smart cities: austerity, unevenness and zero-sum game.

First, the major aspect of neoliberalisation of the economy is that reducing the public investment of the state by encouraging liberalisation and privatisation will, in the end, open the path toward the creation of a massive smart city with the direction of corporate interests: an austerity policy. Austerity is a policy regime that involves tax hikes and the reduction of state budgets through “a combination of welfare retrenchment, privatisation, a roll-back of universal social policies and labour market protection”.³¹ The countries in Southeast Asia have implemented austerity programmes differently and gradually according to the respective ruling governments’ interests. And they are using austerity as a means of policy reform, responding to the rebalancing of the economy after the 2008 Asian financial crisis. In gen-

30. See Harvey, David. 1989, p. 3.

31. Carvalho, Tiago. 2022. *Contesting Austerity: Social Movements and the Left in Portugal and Spain (2008-2015)*. Amsterdam: Amsterdam University Press.

eral, from 2010 to 2020, governments in the EU and ASEAN adopted austerity programmes by reducing and cutting the state budgets for social reform programmes, cutting and reducing subsidies and wages, raising consumption taxes, introducing labour market flexibilisation and so on.³²

To highlight some specific cases, in Germany, after World War I and II, the German constitution and its social code demanded that the local, regional and national governments implement comprehensive social housing policies that ensure the right of housing for its citizens. The state must find and provide a suitable house for those who are in difficult economic or social positions, having been evicted, including the provision of temporary accommodation such as hostels, rented rooms or confiscated apartments for the homeless. However, given the austerity cuts on social housing programmes over the previous two decades, this caused rapid increases of rent in urban areas. In another case, in Paris, cuts in the social housing programme have transformed the right to housing into the right to shelter – the austerity policies led to an increase in the number of homeless people, the expansion of slum areas occupied by migrants, refugees and the homeless, and the further deterioration of the existing emergency shelter programme for marginalised people, specially during the winter periods.³³ These are a few of the real problems faced by the people living in cities, and the technology-centric approach is not enough to tackle the problem of sustainable right to housing and all other aspects of social rights that have been privatised.

The McKinsey Global Institute³⁴ estimated that in ASEAN alone, a technology-enabled solution to smart cities could create 1.5 million jobs, that residents could save around \$16 billion in cost of living and that up to 5,000 unnatural deaths in the region, such as from traffic accidents, could be prevented. This celebratory tone was adopted by the advocates of smart cities in both the EU and ASEAN. However, they have denied the unevenness and zero-sum nature of cities under the capitalist mode of production and

32. Ortiz, Isabel, Cummins, Matthew, Capaldo, Jeronim, and Karunanethy, Kalaivani. 2015. *The Decade of Adjustment: A Review of Austerity Trends 2010-2020 in 187 Countries*. Geneva: International Labour Organization, Columbia University and The South Centre.

33. Matteuci, Stefano and Halliday, Simon. 2017. *Social Rights in Europe in an Age of Austerity*. New York: Routledge.

34. McKinsey Global Institute. 2018. *Smart Cities in Southeast Asia*. Jakarta: McKinsey & Company.

economic system, in which investment in productive means, such as new technology, was a necessity under capitalism in order to lower the cost of production, thereby resulting in more unemployment and generalised precarious working conditions and unstable jobs for the majority.

The smart cities in the EU and ASEAN propose a multi-stakeholder approach, based on a vision of harmonious togetherness between private capital, state and community, or, as the official policies demonstrate, a partnership between the supra-national entity, national states and local governance in collaboration with the private sector and transnational corporations. However, many of the projects are still dependent on the interests and goodwill of the corporate private sectors, their investments in innovation, creativity, research and development and so on. Similar to the situation in the EU, in the ASEAN region, the partnership is premised on the consortium model, which engages local governments with foreign capital, and the smart city initiative is state-led and private sector-led. However, there remains a huge dependence by the local and national governments on private and foreign capital to develop smart city projects. UN Habitat Report³⁵ found that cities from developing countries, which include most of the ASEAN member states, suffer from fiscal incapacity and inadequacy of funds to finance their urban projects.

In Malaysia, the government is enthusiastic about developing a smart traffic management system that can make transport effective, ensure safety, increase energy efficiency and reduce time and cost. In the end, it used and depended on capital and resource investments from both global and local corporations, such as Alibaba Cloud and Sena Traffic Systems Sdn Bhd. In Makassar, Indonesia, despite promoting the ideas of combining local wisdom with the techno-modern discourse of smartness, the smart city project still depends on corporate investments. In this case, Indonesia's largest telecommunication company, Telkomsel, and several Singaporean companies have been invited to work with the Makassar administration on the development of smart city initiatives.

This all shows that smart city initiatives promoted by regional, national or local governments are dependent on corporate technological and finan-

35. UN Habitat. 2022. World Cities Report 2022. Kenya: United Nations Human Settlements Programme.

cial resources for implementation. In consequence, this will expand the corporatisation of public provisions and services – the traditional domain of the state in providing public services for the common good of the citizens has gradually shifted to the sharing arrangement known as public-private-partnerships or privately run and owned public provisions. This all shows that local or national governments are neglecting the critical and strategic role of the people in the development of smart cities, and they remain trapped in the false rhetoric of a bottom-up initiative when in fact, the smart city initiatives remain top-down and corporate-directed and that, in the end, only serve the interest of profit-maximisation because private corporations work on the basis of wealth accumulation and not charity and solidarity.

Thus, the neoliberal assault on public democratic institutions and the traditional Keynesian role of the state in providing social services to the citizens in both the EU and ASEAN remains pervasive over the last few decades, even after the post-pandemic economic recovery. Public services and social funding have been subject to drastic reductions and cuts, which might lead to liberalisation and privatisation of the public domain into corporate hands – privatisation, marketisation and commodification of space is the requirement of neoliberalism. This, too, has occurred in the transformation of urban governance, from the managerial to the entrepreneurial and corporate model of urban governance. As noted in the discussion on the rescaling of spaces, the implementation of smart city initiatives is nothing but a reconfiguring of spaces to attract foreign investments and is an elitist vision of the growth and development strategy of the state based on neoliberal austerity programmes.

Second, development continues to be shaped by the process of global capital and by the structure of centre and peripheral dynamics, and the smart city as an entrepreneurial city will foster competition rather than cooperation. Smart city implementation in both regions has been, and will remain, constructed according to this objective law of global capital, and centre-periphery relations of the North (the EU) and the South (ASEAN). The cities in the ASEAN region have been redeveloped according to the trajectory and development of neoliberalism, and will remain influenced as such by the demands of neoliberal globalised modernity centred on the Western-led international liberal capitalist order. For instance, the cities in the ASEAN region where smart city initiatives have been implemented are part of the global process of capital accumulation and the globalised production network of monopolies from Europe – many smart cities in the ASEAN region

are host to the outsourced production centres and investments of European and global capital.

Singapore has been developed according to the global market demand to incorporate colonies and post-colonial city-nations into global market capitalism, wherein property developers, technocracy approaches and investment-driven planning provide the main orientation and direction during the post-industrial development of the city.³⁶ Thus, smart cities in the ASEAN region have been designed to co-opt, integrate and complement the requirements of the auto-centric development of European cities. This has been the case since colonialism, or from the early industrial approach to urbanisation to a modern neoliberal logic of urban planning and smart city development in the EU and ASEAN.

The production of spaces of the cities in Europe where smart cities were implemented was part of the asymmetrical and uneven relations between the EU and ASEAN, where the latter are developed and underdeveloped according to the necessity and demands of the auto-centric development of the former. The new model of smart cities required a transformation of the relations between the two regions, and changes within the structures of the political, economic and governmental systems of the member countries of both regions. Hence, the existing cooperation between the EU and ASEAN on smart cities shall need to move beyond this asymmetrical relation of the two regions.

In addition, attraction of international capital is the major inspiration behind the creation of smart city initiatives at the policy level in the ASEAN region. And the smart city initiatives in the ASEAN region have entered a level of trans-continental cooperation, and were part of the geo-economic strategic calculations among states that played the most dominant and influential role in Southeast Asia, such as the United States of America (US). In 2018, the US established the US-ASEAN Smart Cities Partnership (USASCP), aimed at funding smart city projects in Southeast Asia. However, it later enabled major US financial corporations such as Mastercard to invest in Southeast Asia, transforming the region economically, deepening the financialisation of the economy and reinforcing the services sector to provide growth in the

36. Padawangi, Rita. 2022. *Urban Development in Southeast Asia*. UK: Cambridge University Press.

region.³⁷ US capital investments in the ASEAN region were part of its Indo-Pacific strategy against China. It is not only the US; other major players and key US allies in the region, such as South Korea and Japan, have also established cooperation with ASEAN to promote smart city initiatives in Southeast Asia where the smart cities serve the strategic interests of the state and capital to compete with and weaken China's ascendancy.

However, the zero-sum situation does not only occur between the former colonies of Europe, the Western powers and the post-colonial states of Southeast Asia or between North and South, but internally, in each region, between various polarised states in the regions. For instance, it is Germany that has a huge interest in and benefits from EU smart city initiatives, while in Southeast Asia, the most financialised, powerful state of ASEAN, Singapore, with its large corporations, has benefited from and is the most enthusiastic promoter of ASCN initiatives. For instance, both the smart city initiatives in Makassar, in Indonesia, and in New Clark City, in the Philippines, are developed by Singapore-based companies in the infrastructure, industrial, urban and digital sectors.³⁸ Cities such as Berlin are more advanced than Lisbon in terms of promoting economic growth and sustainability.

In short, competition always leads to monopoly and hegemony – it is the basic element and an unending desire of capitalism; therefore, a change from the managerial to the entrepreneurial style of governance will continue to open the way to a zero-sum pattern of development. It is too utopian and bleak in vision for advocating cooperation between capital, the state and the community, when it is the capital/corporates who are competing to secure profits that are dictating and steering the direction of smart city development and inter-city relations.

Third, smart cities as such could not address the real unevenness and spatial injustice. In the EU and ASEAN regions, social segregation and economic inequality are deepening, and the gap between the poor and the rich, expressed through the spatial disparities, is widening in the major European

37. Kim, Sea Young. 2022. Creating Smarter and More Sustainable Cities in Southeast Asia: A Roadmap for United States-South Korea Cooperation. *Asia Pacific Bulletin*, East-West Center, Number 579 | January 6.

38. Tan, Si-Ying, Taeihagh, Araz and Sha Kritika. 2021. How Transboundary Learning Occurs: Case Study of the ASEAN Smart Cities Network (ASCN). *Sustainability* 13, no. 11: 6502. (<https://doi.org/10.3390/su13116502>).

and ASEAN cities. In particular, migrants have contributed significantly to the European economies since the era of colonialism, but until now, they have mostly occupied the lower-class positions in European cities, and spatial segregation has manifested their income differences and spatial inequality between the countries and regions of origin.³⁹ In the ASEAN region, migrant workers have been facing a similar structural problem of discrimination and precariousness all across the major cities, including the problems of low-wage workers in Singapore.⁴⁰ How can the smart city concept provide solutions to this real unevenness and spatial injustice?

There are some key examples that we can utilise to challenge the conventional wisdom of the smart city concept that is traditionally associated with the elitist vision of property developers, capitalism and the technocracy. In the ASEAN region, especially in Jakarta, Indonesia, people have died due to illnesses, and the incidence of malnutrition and impoverished diseases remains high, especially among the urban poor. However due to dietary changes, it is not only malnutrition that causes a high number of mortality as in the decade of the 1990s. As of 2022, this has been replaced by high blood pressure, high body mass and high fasting plasma glucose as the primary causes of mortality, where stroke and ischaemic heart disease (IHD) are responsible for up to 16 per cent and diabetes for up to 8 per cent of deaths.⁴¹

Poor city dwellers in low-income countries, including Indonesia, the Philippines, Myanmar, Laos, and Cambodia, have huge disparities in terms of accessing affordable health facilities and their levels of exposure to infectious diseases are far higher than those of the rich. There is also a division between those living in the slum and non-slum urban areas. In the Philippines, the percentage of poor women living in slum areas accessing health facilities for birth attendance is about 88.2 per cent compared to 96.2 per cent for those living in non-slum areas, and in Manila alone, only 91.8 per

39. Tammaru, Tiit, Marcińczak, Szymon, Ham, Maarten van and Musterd, Sako. 2016. *Socio-Economic Segregation in European Capital Cities: East meets West*. London & New York: Routledge.

40. Kathiravelu, Laavanya and Wong Boon Keng, George. 2019. *Marginalized Migrants And Urbanization In Southeast Asia*. In Rita Padawangi (ed.). *Routledge Handbook Of Urbanization In Southeast Asia*. New York: Routledge.

41. See UN Habitat Report (2022), pp. 217-254.

cent of women living in slum areas have access to health facilities compared to 92.3 percent of women living in non-slum areas.⁴²

Economic and social inequalities are also expressed in terms of spatial unevenness. These are all issues that, I believe, smart city initiatives centred on data or technology alone cannot solve. How can a smart city build a resilient and sustainable city when its residents are incapable of affording universal healthcare just because their health services are being privatised?

In another instance, the Magelang district from Central Java of Indonesia has committed to promoting technological advancements to transform the city into a smart city but it is facing a real situation where one-third of its poor population have no access to mobile phones.⁴³ However, the solution is not to expand the market to include these poor people by lowering the cost of mobile phones, but rather it raises the question as to how the poor people can be informed, and to participate in and take advantage of technology-enabling smart city initiatives without any basic devices such as mobile phones? This confirmed the social but also digital divide between the poor and the rich.

Even though we have identified the patterns and processes of austerity, zero-sum game and unevenness that is halting the potentiality of smart city initiatives in being directed and managed by the public and community initiative, I will remain optimistic about the collective will of the people that want to transform the world into a more egalitarian and just place. Examples in Europe, such as those in Paris or Barcelona, about the “re-municipalisation” in the city, by resisting and reversing the privatisation imposed by the neoliberal reforms carried out over the last few decades on public goods and services demonstrated how a city can be an organised space for popular democracy and progress. Paris and Barcelona have brought water services back to public management since 2010; this shows that smart cities should be organised according to the maxim that the public management of common goods is for public welfare. This initiative of defending the public welfare provision should be a lesson learned for any smart city initiative, both in the EU and ASEAN; because the important questions are: How can people have economic, social, political and environmental justice in the smart city

42. Op. cit., p. 223.

43. Op. cit., p. 289.

initiative? How can people direct and manage collectively and democratically the urban spaces and smart city for the social and economic benefits of people instead of the capitalists, corporates and elites?

5. CONCLUSION: PROPOSALS FOR POLICIES AND STRUCTURAL CHANGES IN SMART CITY INITIATIVES

We have discussed how neoliberalism was central to smart city initiatives, perhaps, how it was the mode of life of neoliberalism that entertained the smart city initiatives' orientation and directions. We cannot understand nor even change the direction of smart cities without really understanding how neoliberalism has organised the social, economic and cultural lives of the citizens in both the EU and ASEAN regions, especially in regard to smart city development. What they have promised about technical solutionism and neoliberal financialisation of smart cities do not result in egalitarian and progressive changes to the lives of citizens in the cities, unless we change the direction and move away from neoliberalism. Smart cities have been dominated by the technocracy and market discourses, such as competitiveness and business-orientation. However, here I propose public policy reforms and structural changes to connect their mutual constitutions. Here are the proposals:

Proposal 1: Changing the narrative and directions of smart cities. As experiments with smart cities in both the EU and ASEAN have demonstrated, the smart city is not a neutral and objective scientific place, and thus it is an ideology- and politics-related place, where the dominant power is organising and preserving the existing established order. The struggle for changes in policies at the structural level shall start with the appropriation of the smart city as a concept, discourse and development model – every citizen has the right to the city, but also the right to have rights and to change the city into a more ecologically-friendly place, with the possibilities for progress and emancipation. Policy reforms, regulations and technology advancements are not enough. To reduce smart cities to simply being technology-enabled police solutions to urban social problems is absurd. And the narrative shall not only be limited to promoting the tenets of efficiency, marketisation, civilising

missions or data-centricity. Hence, we need to reimagine a new subject of citizens and reinvent a new smart city that moves beyond the actual market logic and configurations of neoliberal citizenship. Changing the narrative means we must change the direction of smart cities outside the hegemonic order of neoliberalism.

Proposal II: Socialisation of technology, digital platforms and rebuilding a new, just political economic system. With neoliberalism, towns, citizens and public governments in both the EU and ASEAN regions depend heavily on the blessings of private capital, resources and investments, and the power of private big capital subject these public-social agents to becoming passive consumers and data-generated value and wealth for corporates. Most of the technological tools in the smart cities of both regions are powered and privately owned by private capital. The economy in both regions, including the “actual existing smart cities”, are fully integrated into the global economy; thus, it raises the risk of monopolisation. Our competitive economy has given rise to monopolies, and the centralisation of wealth or capital follows hand-in-hand with the centralisation of the means of production and distribution, such as technology, science, and digital platforms. In order to ensure that smart city initiatives belong to the citizens, serving the interests of the subaltern people and empowering the community to direct the egalitarian transformation of the city, the socialisation of technology and digital platforms is urgently needed. The technology and digital platforms involved in the development of smart cities shall be owned and managed by the citizens, by those who perform and work, and this will promote community-led initiatives to form active, critical and conscious citizens in the smart city initiatives. In addition, the socialisation of technology and digital platforms in the smart cities must be followed by the transformation of the social relations of production and the regime of property in the economy and the state, in which the production of the economy is for use-value rather than exchange-value, for social needs rather than the market logic, and for the well-being of the people and the planet rather than for profits.

Proposal III: Balancing technological development with full employment and well-being of the citizens. Despite the optimistic rhetoric that claims that smart cities could create million of jobs in the EU and ASEAN regions, we firmly contend that the development of technology under the regime of profit has brought unemployment, stagnation, and a transformation of the labour pro-

cess: many semi-skilled workers in cities that hosted smart city initiatives are forced to work in precarious situations and on subsistence wages. Working people are increasingly moving into the services sector rather than the productive sector of the economy in both regions, as a consequence of deindustrialisation, financialisation of the economy and neoliberal austerity policies imposed in the states and in the smart cities of both regions. How can the development of technology and digitalisation-enabled development encourage the growth of both material wealth and productive capacities without really sacrificing the well-being of the citizens? Here, needless to say, the digitalisation and technology-centred development should be balanced with the concrete and real commitment toward social ownership, full employment and egalitarian wealth-distribution to the community rather than promote an economy where the few exploit and extract mass value from the majority, and instead of creating relative unemployment in the North/EU region, it has consolidated absolute poverty and mass unemployment in the South/ASEAN region – the mass poverty and unemployment laced under the extravagant unliveability of smart cities.

Proposal IV: Promoting central coordination and planning across smart city initiatives and networks. Since the economy in the EU and ASEAN regions are fully operating under the anarchy of the market, without the central planning of a democratic institution, where the citizens can control and direct the public policies and development processes, the idea of smart cities will thus remain illusory with respect to addressing the challenges that citizens have been facing in the cities, such as access to housing, secure jobs, water, internet, healthcare or some other universal basic rights for the citizens to live in dignity and justice – to have the rights to the smart city but also the rights to change the city into a more just, democratic and egalitarian city. In other words, there is no technical solution to social problems, such as income inequality, exploitation, alienation or mental illness, that characterise the real social problems facing urban citizens in both regions, especially in the actual existing smart cities. The policies and technological changes in the smart city initiatives should be followed by a democratisation of the economy, cultural reforms, a mass participatory form of governance and the creation of a non-repressive political state – this is to say, traditional or predominant smart city initiatives in both regions have not only contributed to but were part of the integrative mass surveillance mechanisms of the state and corporate power. Hence, what we need in the smart cities is a process of decentralisation and

devolution, followed in the meantime by the democratisation of the political and economic systems – where the people are empowered, participating in, and taking and controlling the decisions. The previous discussion shows that the actual existing smart cities promote the interests and power of corporates and monopolies. Hence, to be clear, the private sector is not elected by the people, but by those who have shareholder rights. Thus, the concentration of economic wealth goes simultaneously with the concentration of political power. In consequence, this enables the designing of smart cities in accordance with the corporate neoliberal-market orientations, which means the transfer of power to unelected groups. This form of distorted representative political systems is rendering citizens generally impotent and powerless. In short, there is a need to replace the anarchy of the market in the smart cities with central planning over a cooperative market economy, and, at the same time, to replace the distorted representative democratic process with a genuine democratic mechanism, where the decision-making process of authority is subjected to the collective will and decisions of the citizens.

Proposal V: North-South symbiosis, and toward multipolarity. Similar to interstate relations, the discussion above has clearly described how European Union cities are not developed on their own, but depend on the relations between the structural core/developed region of the EU and the periphery/underdeveloped region of ASEAN. It is rather contradictory, and competition governs their asymmetrical relations. The relations should be shifted from unevenness toward combined development, by promoting the spirit of cooperation and solidarity between cities in both regions rather than competition between corporates and entrepreneurial smart cities. North-South asymmetrical relations and uneven development between states represent the asymmetrical, zero-sum game and unevenness in relations between cities too.

08

How to Mainstream Marginalised Groups in Environmental Justice in Urban Areas?

Kanyara Sath

Abstract

The paper provides general perspectives on inequalities in society in terms of designing land uses, accessing resources and services, and the changing economic conditions of human beings, all of which create health and social issues. The research describes the background history of the Industrial Revolution and the Green Revolution in the 19th to 20th centuries where there was pressure on natural resources and the environment, intensive labour usage, social unrests, and adverse health impacts from industries, all of which led to environmental injustice. The paper will provide the definitions of environmental justice and injustice and identify the key stakeholders that contribute to the causes of problems, including national governments, private sector entities, and cultural and individual racism and discrimination. Three case studies in Cambodia will illustrate the causes of the injustice in terms of land use planning and zoning divisions affecting urban poor communities and slum settlements. Finally, recommendations will be provided on the way forward to transform the challenges and issues of environmental injustice into opportunities for positive change through looking at not only the environmental perspective but also the social, economic, and political situations.

1. INTRODUCTION ON ENVIRONMENTAL INJUSTICE

The origin of environmental injustice goes back as far as the origin of human civilisation. Any human settlement requires some type of land use system, places to grow crops, places to live in, and places to throw wastes. The decisions as to how to create these areas within communities (often) create winners or losers relating to social issues such as: who can live closer to the field, who will live up on the hill where there is fresh air, and who will live closer to the sewage area?

The Industrial Revolution in the 19th century and the Green Revolution in the 20th century, while making human lives much better in terms of their economic growth, also contributed to rapid population growth. As populations continued to grow, so too did pressure on the environment. As people within the society compete for resources, social inequality intensified as not everyone has the power to access the same number of resources¹. The Industrial Revolution, in particular, greatly increased this inequality as resource extraction became much greater and pollution became much more intense with the fossil fuel-based economy. During this period of the Industrial Revolution, there were serious social and health impacts arising from industrialisation².

Beginning in England, industrialisation, which led to the notion of modernity, has continued up to the present day, as modern society relies on intensive resource extraction. These actions create massive amounts of pollution, deforestation, contamination of natural water resources and other negative environmental impacts, including climate change³. There are huge inequalities in terms of public health and human well-being, access to green public spaces and natural areas, and the environmental quality of life, such

1. Cable, S. and Shriver, T. 1995. Production and extrapolation of meaning in the environmental justice movement. *Sociological Spectrum*, 15(4), 419-442.

2. Gollin, D., Jedwab, R. and Vollrath, D. 2016. Urbanization with and without industrialization. *Journal of Economic Growth*, 21(1), pp. 35-70.

3. Carter, E. D. 2010. *Rethinking Environmental History: World-System History and Global Environmental Change*.

as clean air, uncontaminated water, and access to nutritious food⁴. Environmental injustice has been shown to be happening in many different ways, from disproportionate pollution loads to transportation inequities to lack of countryside access because of rural racism⁵.

In addition, environmental injustice could be created as a result of inequality among people in the society, which is closely linked to modern racism and discrimination. Racism related to skin colour, ethnic minorities, and the poor is a very clear factor in land use planning. Studies have shown that in the United States race is the clearest predictor of where hazardous waste facilities will be located⁶. These effects have led to the creation of the term *environmental racism*.

This paper will provide a narrative on how marginalised groups in urban areas could be affected through unplanned planning which lead to environmental injustices. The paper will provide the general definitions of environmental justice and injustice and the causes of problems. Case studies in Cambodia will be used to illustrate the causes of the injustice in terms of land use planning and zoning divisions affecting urban poor communities and slum settlements. The paper will also provide recommendations to consider in terms of political willingness, capacity of the state, and community participation.

2. OVERVIEW OF URBAN POOR COMMUNITIES IN CAMBODIA

The current rate of urbanisation is far beyond governments' ability to provide basic housing and services. Urban poor communities often live illegally on

4. Schilling, J. and Linton, L. S. 2005. The public health roots of zoning: in search of active living's legal genealogy. *American journal of preventive medicine*, 28(2), pp. 96-104.

5. Agyeman, J. 2002. Constructing environmental (in) justice: transatlantic tales. *Environmental Politics*, 11(3), pp. 31-53.

6. Bryant, B. I. and Mohai, P. 1992. *Race and the incidence of environmental hazards*. Westview Press.

public or private lands; under such circumstances, lack of basic services such as water and electricity, overcrowding, and poor sanitation are the norm⁷.

As urbanisation proceeds, the poor tend to be displaced from the inadequate affordable housing stock. Public housing, if available, is often inappropriately sited, poorly designed, and unaffordable by those in the greatest need. As government policies fail to meet the needs of the urban poor, government commitment tends to decrease further⁸.

Cambodia is a country that has made rapid yet uneven economic progress since the fall of the Khmer Rouge in 1979. In 2015, the Gross National Income (GNI) was estimated to be equal to US\$300 to \$1,070 per capita⁹. Official statistics report that poverty has fallen dramatically, reaching 13.5 per cent in 2014 compared to 47.8 per cent in 2007¹⁰. While Cambodia's development trajectory has been remarkable, the benefits of the economic progress have been very unevenly distributed. More than 25 per cent of Cambodia's entire population of 16 million remain extremely vulnerable, characterised as near-poor, and at risk of returning to poverty conditions¹¹.

Cambodia's urbanisation is relatively new. As of 2014, 21 per cent of the population lived in urban areas. With urbanisation expected to grow by 2.5 per cent per annum for the foreseeable future, the urban population is projected to reach 8.1 million by 2050 (Figure 1)¹². While the urbanisation rate generally correlates with increased per capita gross domestic product (GDP), Cambodia's urbanisation lacks proper planning. While laws and policies ex-

7. Moeng, Monyranak, Eunkwang Kim, and Sang Hong Lee. 2020. Affordable Housing Strategy of Low and Middle-Income Class to Enhance Living Condition at the Outskirts of Phnom Penh City, Cambodia. *한국주거학회논문집* 31, no. 3 (2020): 61-70.

8. Emilie, David S. 2020. Affordable housing in Phnom Penh: Ensuring decent housing opportunities for all.

9. World Bank. 2019. Recent Economic Development and Outlook. Investing in Cambodia's Future: Early Childhood Health and Nutrition. The World Bank Group. Accessed May 2019.

10. World Bank. 2021. The World Bank in Cambodia - Overview. Accessed 14 April 2021. Available at: (<https://www.worldbank.org/en/country/cambodia/overview>).

11. United Nations Development Programme. 2019. Cambodia Human Development Indicators. Retrieved on 1 December 2019. (<http://hdr.undp.org/en/countries/profiles/KHM>).

12. Planning, M. O. 2015. Cambodia socio-economic survey 2014. Phnom Penh, Cambodia: Ministry of Planning.

ist, implementation is hindered by low capacity and weak institutional commitment.

The Cambodian housing market is focused increasingly on high-end development, with prices increasing in the urban areas. According to the 2014 Socio-Economic Survey data, the median income of the Phnom Penh population is about \$1,400 per year and only 10 per cent of the population can afford to buy homes, based on their earnings¹³. According to National Housing Policy, this suggests that only the city's top 10 per cent have sufficient resources to afford a home¹⁴. This can be interpreted as meaning that access to affordable housing will be decreasing in the future, which is the main challenge for ensuring access to affordable housing and effective urbanisation development to sustain welfare, and economic and social prosperity¹⁵.

In Cambodia, urban poor communities are described as communities that are informal or that have been relocated from informal settlement areas. Government authorities identify 11 zone types where these communities are located, such as state public land (rail and roadways, riverbanks, etc.), state private land, relocation sites, or private lands being rented out¹⁶.

3. METHODOLOGY

The first stage of the study was to carry out a literature review to understand the definitions of environmental justice, the background of urban poor communities in the context of Cambodia and interconnected issues concerning environmental injustice in urban areas. The literature review also provided insights into the history of the Industrial Revolution and developments which lead to environmental injustice, and key stakeholders as agents contribut-

13. Planning, M. O. 2015. Cambodia socio-economic survey 2014. Phnom Penh, Cambodia: Ministry of Planning.

14. Royal Government of Cambodia. 2014, National Housing Policy, Council of Minister on May 09. Ministry of Land Management Urban Planning and Construction (MLMUPC).

15. World Food Program. May 2019. Urban Vulnerability in Phnom Penh.

16. Capital, P. P. and UNICEF. 2012. The Phnom Penh urban poor assessment: A baseline survey on the social and economic situations and capacity of existing services in urban poor communities. Phnom Penh, Phnom Penh Capital & UNICEF, 5.

ing to environmental injustices, including cultural and individual behaviours leading to injustice in society. Also, articles, newspapers, journals, notes from community meetings, trainings and workshops, government announcements, and private development proposals were collected as evidence and references. All these insights from the literature review were used to inform the key issues raised by local communities to be addressed by government authorities related to land conflicts, housing issues, land tenure security, infrastructures and services, and livelihood improvements.

The second stage of the study will involve conducting interviews with the field staff and the director of Community Empowerment and Development Team (CEDT) to understand the working relationships between government authorities, local communities, and civil society partners in the project areas examined in the case studies. The interviews helped to provide an understanding about the political willingness and the roles and responsibilities of government authorities and the private sector with respect to responses to the issues raised by local communities. And they helped to provide an understanding of the capacity of government authorities related to legal enforcement, state budget limits for local authorities working on informal settlements, and awareness-raising and education of citizens in relation to their engagement in urban planning and management.

Community documents were collected for analysis on: a community's legal rights to access their lands, the individuals' capacities and resources within the community, and internal structures and rules, including community by-laws, financial reports and plans, community profile histories and current families' statistics. These documents also included community hand-drawn maps, geographic information systems (GIS) mapping, community housing proposals, community land and state land boundary demarcation, infrastructures and public services planning request letters, and private companies' development plans for the area.

Third, the legal frameworks of Circular03, Land Law 2001, and other regulations were reviewed to see how these current legal frameworks support and challenge the local communities, especially informal settlers, in their efforts and legal rights. Circular03 and Land Law 2001 were key legal documents to review. Other legal legislations, frameworks, policies and national strategic frameworks in Cambodia were combined and reviewed. Three case studies were analysed to reflect what the laws and policies said versus the actual implementation.

Limitations on Data Collection

The data collection was conducted during the COVID-19 pandemic in 2021. There were restrictions imposed by the Cambodia government related to in-person meetings. Therefore, this research lacks the participation and engagement of several target groups, including local authorities in Phnom Penh and Battambang, local communities, and key civil society non-government organisations (NGOs) who work closely on the topic. The information collated was based on secondary data collections, interviews with one organisation (CEDT), and the literature review, which made arguments less strong as the research lacks the expression of opinions directly from several key actors and stakeholders.

4. LITERATURE REVIEW

4.1. The Definitions of Environmental Justice and Environmental Injustice

While the definition of environmental justice is fiercely debated, the term has been incorporated in the modern understanding of social development. There are various definitions of the terms *environmental justice* and *environmental injustice* from various scholars, researchers, politicians, and environmentalists. The definitions are accepted by the people in various ways, depending on the political, institutional, and geographic contexts. The definition of environmental justice from environmental activists is that all kinds of toxic pollution will not be allowed; meanwhile, United States federal agencies expressed the continuation of the production of toxic waste as long as there is no harm caused to local communities¹⁷. In addition, other scholars

17. Holifield, R. 2001. Defining environmental justice and environmental racism. *Urban geography*, 22(1), pp. 78-90.

demand that the definitions must consider the issues in the context of developing countries' urban areas¹⁸.

Environmental justice is based on the principle that all people have a right to be protected by the state, including respecting the rule of law and human rights, from environmental pollution and to live in and enjoy a clean and healthful environment; while environmental injustice is the opposite¹⁹. Environmental justice is the equal protection and meaningful involvement of all people with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies and the equitable distribution of environmental benefits²⁰. Environmental justice, on the other hand, is the lack of these qualities.

4.2. What are the Causes of the Problems and Their Impacts?

There are several factors commonly seen as causes of environmental injustice. The first is institutional discrimination coming from the government. Government-led planning and zoning decisions lead to unequal development in different parts of cities since decision-makers have designed the zoning to protect the investments and property values in some areas while segregating areas based on poor and rich communities²¹. The poor population become located in the areas with hazardous industries, with poorer schools and with fewer facilities and infrastructures, including green spaces. These lead to different environmental qualities and healthcare standards in

18. Wilson, S., Hutson, M. and Mujahid, M. 2008. How planning and zoning contribute to inequitable development, neighbourhoods health, and environmental injustice. *Environmental Justice*, 1(4), pp. 211-216.

19. Bullard, R. D. (ed.). 2005. *The quest for environmental justice: Human rights and the politics of pollution* (Vol. 19, pp. 32-33). San Francisco: Sierra Club Books.

20. Faber, D. R. and Krieg, E. J. 2002. Unequal exposure to ecological hazards: environmental injustices in the Commonwealth of Massachusetts. *Environmental Health Perspectives*, 110(Suppl 2), p. 277.

21. Schilling, J. and Linton, L. S. 2005. The public health roots of zoning: in search of active living's legal genealogy. *American journal of preventive medicine*, 28(2), pp. 96-104.

different neighbourhoods²². The advantaged neighbourhoods have facilities that promote healthy lifestyles, exercise, and good environmental quality. Disadvantaged neighbourhoods suffer from poor environments with more disorders, crimes, and social problems²³. Studies show the associations between these problems and higher rates of health problems, including insulin resistance, hypertension, obesity, low physical activity, and poor diet²⁴.

The second commonly mentioned cause of environmental injustice is prejudice among private sector companies and the entire market-based economy²⁵. For instance, private banks and other mortgage institutions increase environmental injustice through race-based differences in access to credit for mortgage and home improvement. Due to a lack of land tenure security, local people living in informal settlements are not allowed to apply for loans from banks and micro finance for their house upgrading as well as small infrastructures inside the local communities, such as waste water management, canal, and drainage systems. As a result, this leads to flooding in the communities and water leakages inside local houses²⁶.

Some real estate companies also block certain neighbourhoods to restrict the access of minorities, people of colour, or others that they believe would cause a reduction of the property value. By doing this, these companies exploit racial tension and prejudice to maximise property values and profits, while making sure that the minorities and disadvantaged are unable to access neighbourhoods with better environmental and social ser-

22. Wilson, S., Hutson, M. and Mujahid, M. 2008. How planning and zoning contribute to inequitable development, neighborhood health, and environmental injustice. *Environmental Justice*, 1(4), pp. 211-216.

23. Gould, K. A. and Lewis, T. L. 2012. The environmental injustice of green gentrification: the case of Brooklyn's Prospect Park. *The World in Brooklyn: Gentrification, immigration, and ethnic politics in a global city*, 2, pp. 113-146.

24. Wilson, S., Hutson, M. and Mujahid, M. 2008. How planning and zoning contribute to inequitable development, neighborhood health, and environmental injustice. *Environmental Justice*, 1(4), pp. 211-216; and Gould, K. A. and Lewis, T. L. 2012. The environmental injustice of green gentrification: the case of Brooklyn's Prospect Park. *The World in Brooklyn: Gentrification, immigration, and ethnic politics in a global city*, 2, pp. 113-146.

25. Massey, D. S. and Denton, N. A. 1993. *American apartheid: Segregation and the making of the underclass*. Harvard University Press.

26. Natharoun, K. 2012. Economic Growth and An Evolving Focus on Vulnerability in Cambodia. *The Center for Khmer Studies*, pp. 9-14.

vices. All of these economic and institutional techniques provide different ways to segregate the poor into specific residential locations away from the wealthy²⁷. Urban spatial land planning and land use planning in Battambang city in Cambodia were developed by local authorities with support from development partners with the purpose of promoting cultural tourism, colonial buildings protection, education, urban development, and low-cost housing for the informal settlements²⁸. The formulation of the spatial plan and land use zone have affected the marginalised groups and are not dealing with the local issues due to the institutional trap set by strategic groups, politicians, and local elites²⁹. The process of dividing land sharing and housing resolutions (sharing equal land plot in each household) to the informal settlements from government authorities at the sub-national level have been delayed for years without any results. Affordable housing for the urban poor has shown few results. The existing models themselves are more aligned with middle-income families' finances but do not fit with lower-income families³⁰.

However, in addition to institutional and private-sector factors, deeper cultural and individual racism and discrimination play a strong role in environmental injustice³¹. The relation of this deep racism to environmental injustice is often overlooked because of the historical disconnection between the environmental movement and the civil rights and human rights movements. While environmentalists advocated for nature and avoided human rights issues, civil rights and human rights activists avoided environmental

27. Gould, K. A. and Lewis, T. L. 2012. The environmental injustice of green gentrification: the case of Brooklyn's Prospect Park. *The World in Brooklyn: Gentrification, immigration, and ethnic politics in a global city*, 2, pp. 113-146.

28. Carter, R., Grayson, G., Hewitt, J., Pilcher, G., Tree, M., Dodman, D., ... Trethowan, T. 2016. Strategic guidelines for heritage for heritage tourism in Battambang Province, Cambodia. Phnom Penh: Ministry of Tourism, Cambodia and University of Sunshine Coast, Australia.

29. Lebel, L., Manuta, J., and Garden, P. 2011. Institutional traps and vulnerability to changes in climate and flood regimes in Thailand. *Regional Environmental Change*, 11, 45-58. (<https://doi.org/10.1007/s10113-010-0118-4>).

30. Lebel, L., Kakonen, M., Dany, V., Lebel, P., Thuon, T., and Saykham, V. 2018. The framing and governance of climate change adaptation projects in Lao PDR and Cambodia. *International Environmental Agreements*, 18, 429-446. (<https://doi.org/10.1007/s10784-018-9397-x>).

31. Bryant, B.I. and Mohai, P. 1992. *Race and the incidence of environmental hazards*. Westview Press.

issues, which they see as part of the elite system that they oppose³². The construction of large power stations by private companies in Thailand for exporting of electricity to neighbouring countries such as Laos and Myanmar were controversial due to a lack of public participation from the civil society and affected local communities in the project, the violation of human rights, health risks, and environmental destruction, including construction dams which affected the flow of rivers and destroyed the ecology and local livelihoods³³.

5. DISCUSSION

Case Study 1: Development Versus Green Space, Filling Sand in BoeungKak Lake in Phnom Penh

The capital of Cambodia is an excellent case study for how these different kinds of discrimination lead to environmental injustice. Phnom Penh has experienced rapid urbanisation in the last few decades. Its population is also growing quickly. In 2019, the city had a population of 2.13 million out of the total population of 16 million in the whole country³⁴. According to a study of urbanisation in 2015, the urban population was 30 per cent of the total population in 2014 and is estimated to increase to around 36.3 per cent in 2030³⁵.

The city is the main point of entry for foreign direct investments (FDIs) into the country. The economy grew by 13.4 per cent in 2018 and attracted

32. Westra, L. and Lawson, B. (eds.). 2001. *Faces of environmental racism: Confronting issues of global justice*. Rowman & Littlefield Publishers.

33. Middleton, C. 2012. Transborder environmental justice in regional energy trade in mainland South-East Asia. *ASEAS-Austrian Journal of South-East Asian Studies*, 5(2), pp. 292-315.

34. Ministry of Information. August 2019. Provisional totals for General Population Census 2019. 8 August 2019. Accessed 12 August 2019. (<https://www.information.gov.kh/detail/326112>).

35. United Nations. 2014. *World urbanization prospects: The 2014 revision, highlights*. Department of economic and social affairs. Population Division, United Nations, 32

total investments worth over US\$3.2 billion³⁶. Between 1994 and 2008, FDIs approved by Council for the Development of Cambodia (CDC) increased from US\$506 million to US\$10891 million.³⁷

The city's rapid development has created problems in terms of infrastructures and urban environmental quality. A 2014 urbanisation study ranked Phnom Penh very low in the Environmental Performance Index (at 162 out of 178 countries) in terms of air, water, and wastewater pollution³⁸.

The urban poor is forced to live in the most environmentally miserable parts of the city. These include open sewerage canals, near garbage dumps, and in one area known as Boeung Trabek Lake, where small wooden houses are erected around the lake, which is really an open-air water treatment pond for the city's sewage. According to People in Need organisation (PIN), the health impacts are dire, with high incidences of skin diseases, respiratory infections, diarrhoea, and eye rashes³⁹. The local urban non-governmental organisation Sahnmakum Teang Tnaut (STT) claims that these ailments disproportionately affect women, who spend more time at home, and children, who play around and in the canal⁴⁰.

Meanwhile, investors profiting from the city's rapid development include the Chinese and Khmer diaspora and middle- and upper-class Khmers⁴¹. Chinese and Vietnamese FDIs also play a key role in influencing those benefiting from the developments; sometimes, directly causing environmental injustice. For example, Boeung Kak was a 90-hectare lake in the northern part

36. World Bank. 2019. Recent Economic Development and Outlook. Investing in Cambodia's Future: Early Childhood Health and Nutrition. The World Bank Group. Accessed May 2019.

37. *Annales De Geographie*. September 2011. Private Investors in Phnom Penh (Cambodia) and the Reconfiguration of the City Center in Relation to the Periphery since the 1990s. Volume 682. Issue 5.

38. Joss, S. 2014. Rising to the challenge: public participation in sustainable urban development.

39. People In Need. 2015. Phnom Penh Multiple Indicator Assessment of the Urban Poor. UNICEF.

40. Mayhew, J. 9 February 2017. Open sewage canals put Phnom Penh's poorest at risks. (<http://www.dw.com/en/open-sewage-canals-put-phnom-penhs-poorest-at-risk/a-37469618>).

41. Pierdet, C. 2011. Private Investors in Phnom Penh (Cambodia) and the Reconfiguration of the City Center in Relation to the Periphery since the 1990s. In *Annales de géographie* (No. 5, pp. 486-508). Armand Colin.

of the city that was leased in 2007 to a Cambodian tycoon backed by Chinese investors. The company filled the entire lake. In addition to legal questions and forced evictions, filling the lake also created flooding problems throughout the city. This has happened many times as developers have filled lakes, closed the city's drainage system and created floods in other districts⁴².

Image 1. BoeungKok Lake before the sand filling.



Source: Google Earth.

Image 2. BoeungKok Lake in 2013 after the sand filling.



Source: Google Earth.

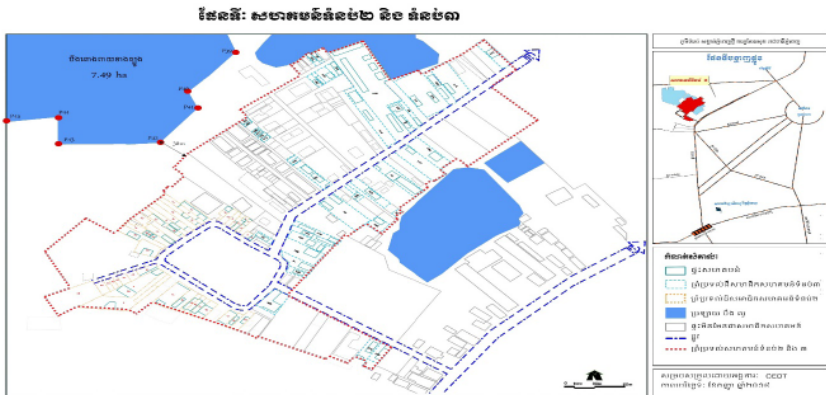
42. Davies, R. 1 October, 2014. Floods and Phnom Penh's Lost Lakes.

Case Study 2: Exclusion of Land Titles of Local Communities through Systematic Land Registration

Tomup village consisted of three communities (Phnom Penh Thmey, Tumnup 2 and Tumnup 3) located in Phnom Penh Thmey Commune, SenSok District, Phnom Penh. Following the fall of the Khmer Rouge, many families came to the area to search for land to settle on and to rebuild their lives, and, beginning in the mid-1980s, former soldiers began occupying the land in Tumnup Village surrounding Boeung Prayap Lake. Between 1989 and 1991, the Ministry of Defence began to settle more families of soldiers in the area – although no formal documentation was issued to land recipients. Later, these families started to sub-divide their land and began selling them off to new families arriving from other provinces. These people relied on income from fishing and harvesting the morning glory vegetables on the lake for supplying local markets in Phnom Penh, as well as from working in the centre of the city⁴³.

The number of households in the village was 861 in 2006, which constitute approximately 4,222 people, and the total land area was estimated to be in excess of 800 land parcels.

Figure 1. CEDT’s GIS mapping of local communities⁴⁴.



43. Community Empowerment and Development Team (CEDT). September 2014. Community Mapping Profiles in Tomunp2, Tomunp3, and Phnom Penh Thmey.

44. Community Empowerment and Development Team (CEDT). September 2014. Community Mapping Profiles in Tomunp2, Tomunp3, and Phnom Penh Thmey.

These communities were excluded from the Systematic Land Registration (SLR) process carried out in 2006. The Land Registration Team (LRT) from the Ministry of Land Management, Urban Planning, and Construction (ML-MUPC) declared these areas as an adjudication area for SLR. At that time, only 195 parcels in the whole village (of over 800 land parcels) had been adjudicated, out of which only 42 land titles had been issued. 154 parcels were recorded as “no data” or as being too difficult or problematic to adjudicate. Essentially a large portion of Tumnap Village had been excluded (removed) from the adjudication area. This decision was made during the process of surveying and demarcation after the start of the SLR process in the village. The reason given for the exclusion from the SLR area was that the community lands overlapped with the natural lake, which is listed as public state land (Boeung PonPey Cheng Lake). This area was supposed to be reserved as a natural lake and as a green zone as determined by Royal of Government Sub-Decree 101⁴⁵.

The local communities had continued to work on dialogues with the national and sub-national governments. With great support from civil society partners, the local communities began working with the members of local communities and the NGO partners to navigate and access the SLR process and mechanism. They worked together with Community Empowerment and Development Team (CEDT) to produce hand-drawn community maps and GIS maps, conducted data collection on possession rights, collated documents, and prepared community profiles. They organised a series of discussions with the local authorities (City Hall, district, and commune authorities) over the issue of the community boundary overlapping with state public land/lake. Then, in July 2012, Prime Minister Hun Sen issued a *Sub-Decree on the Determination of the Boundary of Boueng Ponpey Tboung and Boueng Ponpey Cheoung in Sangkat Phnom Penh Thmei, Khan Sensok as State Public Land*. The sub-decree determined two important lakes in Khan Sensok Boueng PonPey Tboung (North) and Boueng Ponpey Choueng (South) as state public land, totalling 140.32 hectares. The local communities and CEDT acquired a copy of the sub-decree. Based on the 45 Global Positioning System (GPS)

45. Sub-degree 101. July 2012. Demarkation Boeng PonPeyKhanCheng and Boeng PonPeyKhanTboung locate in Phnom Penh Thmei, Kmoung, and ToulSangker commune, RusseyKeo District, Phnom Penh as Public State Land.

waypoints included as the lakes' boundary in the sub-decree, CEDT assisted the local communities to develop a community boundary. It was verified that the community boundary did not overlap with the state public land/lake by the placement of a 33m buffer between the community and Boueng Ponpey Tboung, which is approximately 7.47ha in size. The updated community hand-drawn and GIS maps were then submitted to the district and commune authorities in August 2013, together with requests for the registration of the land and for land titles to be issued to the community members. During a meeting, the local authorities did not reject the community boundary due to the clear reference to the GPS waypoints in the sub-decree.

Following public consultations, medias advocacy, a series of conferences, workshops and meetings with relevant stakeholders, especially between the local communities and government authorities (both national and sub-national level) on clarification between the community land boundary and the natural lake based on the Royal of Government Sub-Decree on 101, it was established that the community land boundary was outside the natural lake boundary, which was far away from the natural lake of 73 metres. The sub-national authorities were agreed on the map; and as a result, the Land Cadastre of District agreed to issuing private land titles to the rest of the families. 150 families out of the 202 families, equal to 164 land plots, received ownership land title in every individual family. Only 38 land plots out of the 164 plots overlapped the boundary of Boueng Pong Pey Lake (state public land).

Figure 2. Clarification of the boundary between state land and private land⁴⁶.



* ឯកសារយោង: របាយការណ៍ស្រាវជ្រាវលើការប្រកាសដីរដ្ឋ និងដីឯកជននៅក្នុងតំបន់ប្រទេសកម្ពុជា និងប្រទេសថៃ ដោយអង្គការសហប្រតិបត្តិការជាតិសម្រាប់ការអភិវឌ្ឍន៍មនុស្សធម៌ និងសង្គម។

46. Community Empowerment and Development Team (CEDT). 2019. Boundary map BoungPongPeyCheunand BouengPongPeyTbong.

Case Study 3: Land Use Planning Impacted Informal Settlements and Community Housing Resolutions

Urban spatial land planning and land use planning in Battambang city in Cambodia was developed by local authorities with the support of development partners for the purpose of promoting cultural tourism, colonial buildings protection, education, urban development, and provision of low-cost housing for the informal settlements⁴⁷. The spatial and land use zoning have been divided into ten categories.

According to a survey carried out by Habitat for Humanity (HBH) in 2019, there were 61 informal settlements located in 7 communes that were living on public state land, such as on road corridors, pagoda land, drainage canals and railway track/stations, while some of the informal settlements are located on state private land – inside an old fabric and shampoo factory that was shut down in 1979⁴⁸. Since 2012, the Municipality of Battambang has identified nine informal settlements as marginalised groups which have no procession rights to claim ownership land titling over their lands. These communities were selected as pilots for the implementation of Circular03 issued by the government “*on the Resolution of temporary settlements on illegal occupied land in the capital, municipal and urban areas*” and as pilots for providing housing solutions.

According to a survey carried out by CEDT in 2015, there were 903 households and 840 families affected, with just over 4,124 residents, 30 per cent of whom were youth, 52 per cent women, and 7 per cent immigrants. The majority of families occupied this area between 1980 and 2000. Most of them are returned refugees from the Thai-Cambodia border. The type of land that the communities occupied are on both state public land and state private land, including: a long road corridor, pagoda land, factory land and railway tracks/stations. Most of the community members were motorbike drivers, factory workers, labourers in construction companies, sellers in the market,

47. Carter, R., Grayson, G., Hewitt, J., Pilcher, G., Tree, M., Dodman, D., ... Trethowan, T. 2016. Strategic guidelines for heritage for heritage tourism in Battambang Province, Cambodia. Phnom Penh: Ministry of Tourism, Cambodia and University of Sunshine Coast, Australia.

48. Habitat for Humanity Cambodia. 2019. Informal Settlements Survey. Internal Report.

and government officers; the rest of the other families were former soldiers who had been repatriated to the area following the war. Those communities are living under adverse conditions: insecurity of tenure, lack of local services such as roads, drainage canals and sewage systems, clean water and electricity, and lack of legal documentation such as identification card, family books, resident record and certificate of birth. The local authorities are open to working with the communities in finding positive housing solutions. These solutions often include positive outcomes such as assurance of tenure and land rights if relocation became necessary in the future.

According to the Spatial Land Use for Battambang City, these areas were assigned for public use for infrastructure development and rehabilitation projects in the city, such as road expansion and drainage development which connects from one commune to another⁴⁹.

The local communities worked with NGO partners, development partners and the government authorities on legal capacity building, a series of negotiations and dialogues, technical support on housing resolution options, and developing the financial resources of the local communities. As a result, three of the nine communities (207 families, 190 houses) were successfully granted land as donations from the state (turning from public state land into private state land and donation as private land) for on-site upgrading and land titling. The local authorities decided to readjust the spatial plan to allow the local communities to live where they had occupied. However, the remaining six communities (696 families) were still living with insecure tenure due to a delay in the response on the community housing proposal from the local authorities⁵⁰.

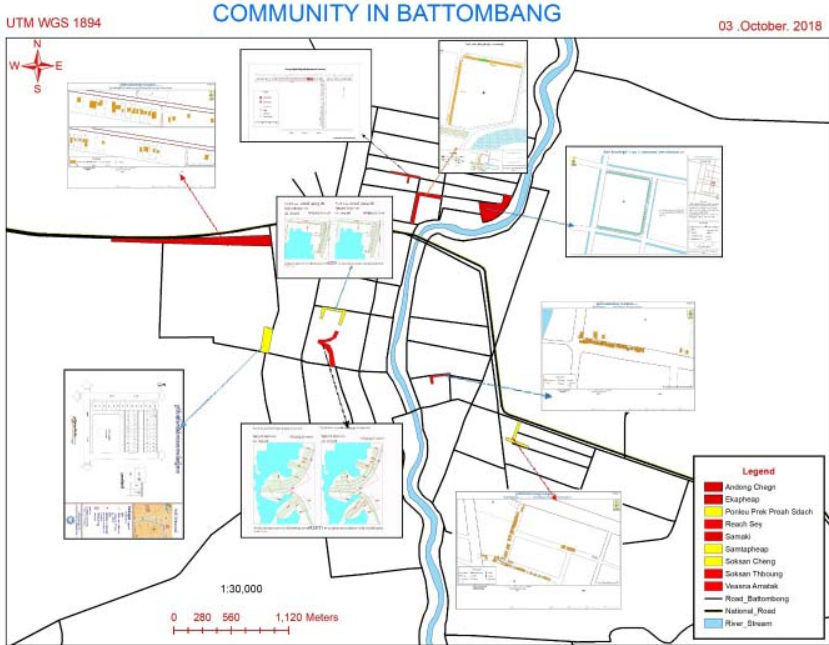
Even though there is political willingness and flexibility from the local authorities in Battambang city to provide housing upgrading and land tenure to the local communities, the formulation of the spatial plan and land use zone have overall affected the marginalised groups due to the institutional capacity of the government being dominated by strategic groups, political

49. Battambang Municipality. 2015. Technical report on land use master plan for Battambang municipality 2015–2030. Phnom Penh: Battambang Municipality and Ministry of Land Management, Urban Planning and Construction.

50. Community Empowerment and Development Team (CEDT). 2020. Strengthening Participation of Urban Poor Communities in Local Governance in Cambodia: A Grassroots Approach towards Securing Land Tenure. Annual Report.

influence, and local elites⁵¹. The process of implementing the land sharing mechanism to the local communities has been delayed for years without any result. Affordable housing for the urban poor has shown few results, as it is less matched with the financial capacity of local communities, especially marginalised groups, but best fit to middle-income families instead.

Figure 3. Informal settlement locations map in Battambang city⁵².



51. Lebel, L., Kakonen, M., Dany, V., Lebel, P., Thuon, T., and Saykham, V. 2018. The framing and governance of climate change adaptation projects in Lao PDR and Cambodia. *International Environmental Agreements*, 18, 429-446. (<https://doi.org/10.1007/s10784-018-9397-x>).

52. Community Empowerment and Development Team (CEDT). 2018. Location Map of Informal Settlements in Battambang City.

6. WAYS FOR PROMOTING ENVIRONMENTAL JUSTICE (PROCEDURES AND SOLUTIONS)

In the previous section, we saw the ways that environmental injustice can cause problems, not only environmental but also social, economic, and political. Understanding these challenges transforms this situation into an opportunity for positive change. When properly understood, environmental justice can become a political opportunity for mobilisation and actions as well as a valid principle in policy debate⁵³.

A key starting point toward deriving solutions is to focus on reforms in decision-making processes and grassroots efforts in order to achieve environmental justice. There are three important considerations for creating real social engagement in environmental justice issues. The first is to present the challenges and opportunities of urban sustainability and environmental justice in socially relevant ways to the urban population and to show the real benefits. Second, technical and far-ranging issues need to be linked to local communities' concerns. Third, the idea of public education and awareness raising of sustainable urban planning and environmental justice issues must be understood to include a wide range of different stakeholders' views and interests, thereby leading to tailor-made engagement processes for public participation⁵⁴.

Government institutions need to recognise these issues in order to engage the public and also to commit to economic and political reforms to promote environmental justice. However, government structures tend to be hierarchical and to concentrate the power to create environmental injustice rather than resolve it. To create real reforms and engagement, there needs to be collaboration with the private sector and cooperation from the communities and the public. To coordinate the actions of the government, markets, and communities to create positive changes, the rights and rules among the three actors need to be clear and technical coordination issues need to be

53. Dobson, A. 1998. *Justice and the environment*. Oxford: Oxford University Press.

54. Joss, S. 2014. *Rising to the challenge: public participation in sustainable urban development*.

solved⁵⁵. However, the challenge is that the government may resolve particular instances of environmental justice but typically does not seek to address the underlying injustice, or unfair or illegal policies that must be reformed to create comprehensive environmental justice⁵⁶.

What is needed is a comprehensive strategy involving the government, market forces, and grassroots community to address these underlying issues. All of these actors need access to information about potential solutions, such as smart growth, sustainability, new urbanism, and active living. Working for change requires these actors to exchange information with urban planners, public health officers, and citizen groups to create new zoning and planning systems that promote sustainable community development and address the public health issues in disadvantaged areas⁵⁷.

An important first step is to create an effective mechanism for public participation. The new draft of the Environmental Code of Cambodia contains detailed provisions on access to information and public participation for all plans, policies, and projects. The Environmental Code also includes Local Participation Committees composed of citizens for land use planning for sustainable cities⁵⁸. The Master Plan on Land Use 2035 also includes a detailed analysis of sectors to be reformed so as to recreate Phnom Penh as a sustainable city⁵⁹.

Using these mechanisms, the government can encourage urban communities to design and implement for themselves local land use planning, urban sprawl management, solid waste management and recycling, reduc-

55. Vatn, A. 2005. Rationality, institutions and environmental policy. *Ecological Economics*, 55(2), pp. 203-217.

56. Bullard, R. D. and Johnson, G. S. 2009. *Environmental Justice Grassroots Activism and Its Impact*. *Environmental Sociology: From Analysis to Action*, p. 63.

57. Wilson, S., Hutson, M. and Mujahid, M. 2008. How planning and zoning contribute to inequitable development, neighborhood health, and environmental injustice. *Environmental Justice*, 1(4), pp. 211-213.

58. *Environment and Natural Resources Code of Cambodia, draft 7 (Final)*, Vishnu Law Group. 31 December 2016. (<http://vishnulawgroup.com/index.php/publications>).

59. Gollin, D., Jedwab, R. and Vollrath, D. 2016. Urbanization with and without industrialization. *Journal of Economic Growth*, 21(1), pp. 35-70.

tion of toxic chemicals, and sustainable energy⁶⁰. To be effective, these efforts require engagement with the private sector and civil society as well. However, to be sustainable, the government must make economic commitments to these efforts, providing long-term funding for this work as normal government services instead of relying on NGOs' and international donors' contributions⁶¹.

However, while these new mechanisms are promising, they do not guarantee environmental justice reform. Changing behaviour is difficult even if it is clear that the new behaviour has benefits over the old behaviour⁶². Proper motivation of pro-environmental behaviour requires the careful analysis of demographic, economic, cultural, and social factors as well as the motivation, awareness, values, and attitudes of the population⁶³.

These factors are complicated in Cambodia. With its recent history of genocide and wars, as well as deep political oppression, there is a widespread culture of fear. While in many countries environmental justice activists can call for policy-making procedures that encourage active community participation and demand a "place at the table" and the right to "speak for ourselves"⁶⁴, this may not work in Cambodia. Cambodia is a country in rapid transformation. The recent history of civil war and authoritarian rule make social change difficult.

As dynamics between the government and citizens continue to change, new kinds of resistance are beginning and the government is learning new

60. Agyeman, J. and Evans, T. 2003. Toward just sustainability in urban communities: building equity rights with sustainable solutions. *The ANNALS of the American Academy of Political and Social Science*, 590(1), pp. 35-53.

61. Agyeman, J. and Evans, T. 2003. Toward just sustainability in urban communities: building equity rights with sustainable solutions. *The ANNALS of the American Academy of Political and Social Science*, 590(1), p. 48.

62. Rajecki, D.W. 1982. *Attitudes. Themes and Advances*, Sinauer Ass. Inc. Publishers, Sunderland, Massachusetts.

63. Kollmuss, A. and Agyeman, J. 2002. Mind the gap: why do people act environmentally and what are the barriers to pro-environmental behavior?. *Environmental education research*, 8(3), pp. 239-260.

64. Milne, S. and Mahanty, S. 2015. *Conservation and Development in Cambodia*. Taylor & Francis, pp. 15-19.

strategies in response⁶⁵. It is not easy to predict what strategy will be the most effective but it is clear that traditional NGO advocacy strategies are not the solution and more innovative efforts that engage real citizens' values and demands are needed⁶⁶.

7. CONCLUSION

Environmental justice has developed into an important topic for research, policy planning, and social change. However, while there is a lot of environmental injustice in Cambodia, its relationship to the historical context and the changing social situation is not clear. Cambodia lacks statistics, case studies, and research on environmental justice. Furthermore, the current solutions being examined are Western and do not fit the Cambodian context.

A lot more analysis and new strategies are needed to address Cambodia's situation. There is a need to focus on the special history in Cambodia of war and genocide, and the special situations in the fast-changing society. Cambodian culture is very different from Western societies, and also different from other Asian countries' cultures. Future research needs to focus very specifically on Cambodia's context to find the best way to mobilise the population to demand change in a way that will lead to positive change for all levels of society.

65. Öjendal, J. and Ou, S. 2013. From friction to hybridity in Cambodia: 20 years of unfinished peacebuilding. *Peacebuilding*, 1(3), pp. 365-380.

66. Milne, S. and Mahanty, S. 2015. *Conservation and Development in Cambodia*. Taylor & Francis, pp. 15-19.

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09

Genuine Community-Based Development

A Path Towards Achieving
Sustainable and Inclusive
Development

Piseth Keo

Abstract

- “Community” has its root in the Latin word “Communitas,” which stems from “communis,” which in turn means “shared by many.”
- Community members are tied together because of their interactions with one another and shared common beliefs, values, and cultural artefacts of life – language, traditions, customs, mores, and so on.
- With diverse social, cultural, religious, economic, and political backgrounds – and multiple interests relating to local resources – each member has a voice in the local decision-making process and a key role to play in community development.
- Genuine community-based development is about providing opportunities for each member of the community to express their voice on matters pertinent to their wellbeing and happiness, and to take the lead in local development trajectories.
- If properly applied, a genuine community-based development approach would be able to explore and exploit local potential, and lay strong foundations for sustainable and inclusive development, locally and nationally.
- The success of the community-based development approach relies heavily on comprehensive village studies, which generate various kinds of datasets such as on geographical settings; natural, physical, and human capital; cultural heritage; institutional arrangements; and leadership.
- The 100 Model Villages Project sets a good example of genuine community-based development.

1. INTRODUCTION

The community-based approach gained momentum in the 1980s, largely due to the failures of state institutions in managing public funds, delivering public services, and functioning properly as a governing body. Having recognised the pitfalls of state systems, scholars, development practitioners, and donors called for more decentralisation from the state to devolve power to the local people.¹ As the lifestyles of rural and indigenous communities are viewed as more harmonised with ecological systems and the environment (in part due to their direct contact with natural resources), it is believed that they are better managers of local resources than distant state authorities and private corporations.² Having communities lead the process would also result in improved responsiveness, effectiveness, cost efficiency, local harmonisation and unity, sustainability, and other benefits.

A few decades after its introduction, the community-based approach has been praised for its contribution to sustainable resource management and rural development through the integration of local institutions, knowledge systems, and customary practices, as well as the participation and involvement of local communities, resource users, and key stakeholders in the plan-

1. Agrawal, Arun, and Clark C. Gibson. 1999. Enchantment And Disenchantment: The Role Of Community In Natural Resource Conservation. *World Development* 27 (4): 629-649. (doi:10.1016/s0305-750x(98)00161-2); Blaikie, Piers. 2006. Is Small Really Beautiful? Community-Based Natural Resource Management In Malawi And Botswana. *World Development* 34 (11): 1942-1957. (doi:10.1016/j.worlddev.2005.11.023); Dietz, T., E. Ostrom, and P. C. Stern. 2003. "The Struggle To Govern The Commons". *Science* 302 (5652): 1907-1912. (doi:10.1126/science.1091015).

2. Brosius, J. Peter, Anna Lowenhaupt Tsing, and Charles Zerner. 1998. Representing Communities: Histories And Politics Of Community - Based Natural Resource Management. *Society & Natural Resources* 11 (2): 157-168. (doi:10.1080/08941929809381069); Li, Tania Murray. 2002. Engaging Simplifications: Community-Based Resource Management, Market Processes And State Agendas In Upland Southeast Asia. *World Development* 30 (2): 265-283. (doi:10.1016/s0305-750x(01)00103-6); Ostrom, Elinor. 1990. *Governing The Commons: The Evolution Of Institutions For Collective Action*. Cambridge: Cambridge University Press.

ning and decision-making processes of natural resource management.³ This discourse is shared by a large number of policymakers, development aid agencies, non-governmental organisations (NGOs), researchers, and practitioners, which then coalesced into a gigantic institutional apparatus to promote the community-based approach all around the world. These aid agencies and financial institutions include the World Bank, the United Nations Food and Agriculture Organizations (FAO), the United Nations Development Programme (UNDP), the World Wildlife Fund (WWF), Conservation International (CI), the International Union for Conservation of Nature (IUCN), the United States Agency for International Development, and the Department for International Development of the United Kingdom (DFID), among others. With political and financial power channelled through aids and loans, the above network manages to introduce and implement community-based programmes in a large number of developing countries in Africa, Asia, and other small island nations.⁴ Policy changes, institutional reforms, cultural shifts, and power devolution from the state to local resource users took place in at least 50 countries and up to 500,000 local organisations for resource management were established as a result of such interventions.⁵

3. Armitage, Derek. 2007. Governance And The Commons In A Multi-Level World. *International Journal Of The Commons* 2 (1): 7-32. (doi:10.18352/ijc.28); Blaikie, Piers. 2006. Is Small Really Beautiful? Community-Based Natural Resource Management In Malawi And Botswana. *World Development* 34 (11): 1942-1957. (doi:10.1016/j.worlddev.2005.11.023); Peet, R., P. Robbins, and J. M. Watts. 2011. *The Global Nature*. In *Global Political Ecology*, 1-48. Oxon: Routledge.

4. Béné, Christophe, Emma Belal, Malloum Ousman Baba, Solomon Ovie, Aminu Raji, Isaac Malasha, Friday Njaya, Mamane Na Andi, Aaron Russell, and Arthur Neiland. 2009. Power Struggle, Dispute And Alliance Over Local Resources: Analyzing 'Democratic' Decentralization Of Natural Resources Through The Lenses Of Africa Inland Fisheries. *World Development* 37 (12): 1935-1950. (doi:10.1016/j.worlddev.2009.05.003).

5. Agrawal, Arun. 2003. Sustainable Governance Of Common-Pool Resources: Context, Methods, And Politics. *Annual Review Of Anthropology* 32 (1): 243-262. (doi:10.1146/annurev.anthro.32.061002.093112); Armitage, Derek. 2007. Governance And The Commons In A Multi-Level World. *International Journal Of The Commons* 2 (1): 7-32. (doi:10.18352/ijc.28); Pretty, J. 2003. Social Capital And The Collective Management Of Resources. *Science* 302 (5652): 1912-1914. (doi:10.1126/science.1090847).

2. PROBLEM STATEMENT

Although many success stories have been widely shared, criticisms levied towards the approach have, however, been mounting. One of the fundamental issues with the community-based approach, critics emphasise, is its simplistic policy-oriented, techno-centric approach and its failure to integrate politics and power struggles into its analysis and institutional design. Power relations and interactions between multiple levels largely affect local dynamics, heterogeneity, and institutions that play significant roles in natural resource management and development in every locality.⁶ Evidence in central and southern Africa indicates that politics and power relations are responsible for the failures of many community-based programmes.⁷ Weak community-based organisations, weak leadership, uneven participation, rampant corruption, and lack of official recognition are some of the reasons for these failures.⁸ This phenomenon is also common in almost every locality, whether in Asia or Latin America.⁹

6. Blaikie, Piers. 2006. Is Small Really Beautiful? Community-Based Natural Resource Management In Malawi And Botswana. *World Development* 34 (11): 1942-1957. (doi:10.1016/j.worlddev.2005.11.023); Cleaver, Frances Dalton, and Jessica De Koning. 2015. Furthering Critical Institutionalism. *International Journal Of The Commons* 9 (1): 1-18. (doi:10.18352/ijc.605).

7. Blaikie, Piers. 2006. Is Small Really Beautiful? Community-Based Natural Resource Management In Malawi And Botswana. *World Development* 34 (11): 1942-1957. (doi:10.1016/j.worlddev.2005.11.023); Campbell, Bruce, Alois Mandondo, Nontokozi Nemarundwe, Bevyline Sithole, Wil De Jong, Marty Luckert, and Frank Matose. 2001. Challenges To Proponents Of Common Property Recourse Systems: Despairing Voices From The Social Forests Of Zimbabwe. *World Development* 29 (4): 589-600. (doi:10.1016/s0305-750x(00)00114-5).

8. Blaikie, Piers. 2006. Is Small Really Beautiful? Community-Based Natural Resource Management In Malawi And Botswana. *World Development* 34 (11): 1942-1957. (doi:10.1016/j.worlddev.2005.11.023).

9. Blaikie, Piers. 2006. Is Small Really Beautiful? Community-Based Natural Resource Management In Malawi And Botswana. *World Development* 34 (11): 1942-1957. (doi:10.1016/j.worlddev.2005.11.023); Leach, Melissa, Robin Mearns, and Ian Scoones. 1999. Environmental Entitlements: Dynamics And Institutions In Community-Based Natural Resource Management. *World Development* 27 (2): 225-247. (doi:10.1016/s0305-750x(98)00141-7); Li, Tania Murray. 2002. Engaging Simplifications: Community-Based Resource Management, Market Processes And State Agendas In Upland Southeast Asia. *World Development* 30 (2): 265-283. (doi:10.1016/s0305-750x(01)00103-6).

The aims of this paper are to provide an overview of the community-based development approach, including its roots and meaning, benefits, and pitfalls, and to propose possible ways in which community-based development can reach its full potential. This paper will start with the introduction of the meaning of “community” and “community-based institution,” followed by a discussion of the benefits of the community-based development approach. This paper then introduces the ideas of genuine community-based development, and gives an example in the form of the 100 Model Village project, which was proposed by the Cambodian government, and welcomed by the Asian Cultural Council. The paper concludes with a summary of the discussion and presents the way forward.

3. PUTTING “COMMUNITY” IN CONTEXT

“Community” has its origins in the Latin word “Communitas,” which stems from “communis,” which means “shared by many”.¹⁰ A community can exist in diverse forms, from academics to social, political, religious, corporate, media, internet, sports, and entertainment groups, among others.¹¹ The definition of “community” for this paper will, however, limit itself to a geography-based definition.

According to Bourke, a community is “a set of social relations occurring within a distinctly spatialised and geographical setting”.¹² People in the community “are tied together because they interact with one another and share common beliefs, values, and cultural artefacts of life – language, traditions,

10. Sullivan, L. E. 2009. Community. In *The SAGE Glossary Of The Social And Behavioral Sciences*. Thousand Oaks: SAGE Publications, Inc.

11. Bourke, G. A. 2010. Community. In *Encyclopedia Of Urban Studies*, 172-176. Thousand Oaks: SAGE Publications, Inc; Hallahan, K. 2005. Community And Community Building. In *Encyclopedia Of Public Relations*, 172-175. Thousand Oaks: SAGE Publications, Inc.; Tracy, K. 2009. Community. In *Encyclopedia Of Communication Theory*. Thousand Oaks: SAGE Publications, Inc.

12. Bourke, G. A. 2010. Community. In *Encyclopedia Of Urban Studies*, 172. Thousand Oaks: SAGE Publications, Inc.

customs, mores, and so on".¹³ In Common Property Theory, "community" refers to a small group of people, whether inland fishers or upland settlers, who share common beliefs and use and share common resources. The community is usually small, with a high level of homogeneity and settled in a bounded territory.¹⁴

Nevertheless, in Political Ecology literature, "community" is geographical-based, complex, and heterogeneous. They have diverse social, cultural, religious, economic, and political backgrounds and multiple interests relating to local resources.¹⁵ Members of communities are all connected in one way or another to those outside their communities.¹⁶ Each member has multiple roles to play, whether in the community or in networks extending beyond community boundaries. In addition, migration, origins, technology, social movements, and non-place-based interactions can all influence and shape practices within a community.¹⁷ The boundary of a community is, in this sense, fluid rather than fixed, as would normally be drawn by cartographers,

13. Hallahan, K. 2005. Community And Community Building. In *Encyclopedia Of Public Relations*, 171. Thousand Oaks: SAGE Publications, Inc.

14. Dietz, T., E. Ostrom, and P. C. Stern. 2003. The Struggle To Govern The Commons. *Science* 302 (5652): 1907-1912. (doi:10.1126/science.1091015); Ostrom, Elinor. 1990. *Governing The Commons: The Evolution Of Institutions For Collective Action*. Cambridge: Cambridge University Press.

15. Agrawal, Arun, and Clark C. Gibson. 1999. Enchantment And Disenchantment: The Role Of Community In Natural Resource Conservation. *World Development* 27 (4): 629-649. (doi:10.1016/s0305-750x(98)00161-2); Blaikie, Piers. 2006. Is Small Really Beautiful? Community-Based Natural Resource Management In Malawi And Botswana. *World Development* 34 (11): 1942-1957. (doi:10.1016/j.worlddev.2005.11.023); Cleaver, Frances Dalton, and Jessica De Koning. 2015. Furthering Critical Institutionalism. *International Journal Of The Commons* 9 (1): 1-18. (doi:10.18352/ijc.605); Leach, Melissa, Robin Mearns, and Ian Scoones. 1999. Environmental Entitlements: Dynamics And Institutions In Community-Based Natural Resource Management. *World Development* 27 (2): 225-247. (doi:10.1016/s0305-750x(98)00141-7).

16. Rocheleau, D. E. 2015. Roots, Rhizomes, Networks And Territories: Reimagining Pattern And Power In Political Ecologies. In *The International Handbook Of Political Ecology*, 70-88. Cheltenham: Edward Elgar Publishing, Inc.

17. Ostrom, Elinor. 1990. *Governing The Commons: The Evolution Of Institutions For Collective Action*. Cambridge: Cambridge University Press.; Rocheleau, D. E. 2015. Roots, Rhizomes, Networks And Territories: Reimagining Pattern And Power In Political Ecologies. In *The International Handbook Of Political Ecology*, 70-88. Cheltenham: Edward Elgar Publishing, Inc.

community-based development practitioners, and administrators.¹⁸ Escobar stresses that “locality and community cease to be obvious, and certainly not inhabited by rooted or natural identities but very much produced by complex relations of culture and power that go well beyond local bounds.”¹⁹ Mobility, non-place-based practices, and different aspects of social identity – which include gender, caste, wealth, age, and origins – can divide and crosscut the community boundary.²⁰ This makes community boundaries more fluid than the fixed lines drawn by cartographers.

Furthermore, the state of crisis of local resources may not have anything to do with local governance systems. Instead, it is largely driven by politics, power struggles, and the interplay of multi-level social and ecological processes.²¹ The root causes of local soil desertification, resource degradation, or biodiversity extinction or exclusion can be global environmental changes, responses to pressures from the global market, or the result of interventions of the state or transnational conservation NGOs in control of local resourc-

18. Escobar, Arturo. 2001. Culture Sits In Places: Reflections On Globalism And Subaltern Strategies Of Localization. *Political Geography* 20 (2): 139-174. (doi:10.1016/s0962-6298(00)00064-0); Leach, Melissa, Robin Mearns, and Ian Scoones. 1999. Environmental Entitlements: Dynamics And Institutions In Community-Based Natural Resource Management. *World Development* 27 (2): 225-247. (doi:10.1016/s0305-750x(98)00141-7).

19. Escobar, Arturo. 2001. Culture Sits In Places: Reflections On Globalism And Subaltern Strategies Of Localization. *Political Geography* 20 (2): 146. (doi:10.1016/s0962-6298(00)00064-0).

20. Escobar, Arturo. 2001. Culture Sits In Places: Reflections On Globalism And Subaltern Strategies Of Localization. *Political Geography* 20 (2): 139-174. (doi:10.1016/s0962-6298(00)00064-0); Leach, Melissa, Robin Mearns, and Ian Scoones. 1999. Environmental Entitlements: Dynamics And Institutions In Community-Based Natural Resource Management. *World Development* 27 (2): 225-247. (doi:10.1016/s0305-750x(98)00141-7).

21. Blaikie, Piers. 2006. Is Small Really Beautiful? Community-Based Natural Resource Management In Malawi And Botswana. *World Development* 34 (11): 1942-1957. (doi:10.1016/j.worlddev.2005.11.023); Cleaver, Frances Dalton, and Jessica De Koning. 2015. Furthering Critical Institutionalism. *International Journal Of The Commons* 9 (1): 1-18. (doi:10.18352/ijc.605); Li, Tania Murray. 2002. Engaging Simplifications: Community-Based Resource Management, Market Processes And State Agendas In Upland Southeast Asia. *World Development* 30 (2): 265-283. (doi:10.1016/s0305-750x(01)00103-6); Turner, Matthew D. 2004. Political Ecology And The Moral Dimensions Of “Resource Conflicts”: The Case Of Farmer–Herder Conflicts In The Sahel. *Political Geography* 23 (7): 863-889. (doi:10.1016/j.polgeo.2004.05.009).

es.²² Oversimplification and flawed assumptions about the complexity of the community can mislead programmes and policies designed to address resource issues in specific localities.²³ Local institutional fixes in the design principles of the main community-based natural resource management literature do not, therefore, necessarily address these underlying issues.

Community empowerment for local development is, for instance, more than simply devolving power from the state to the local community, but understanding and addressing the complexity of social differentiation and political fragmentations of various groups in a community.²⁴ Sharp social inequalities at the village or community level can have potential pitfalls for local collective governance of resources and community-based initiatives.²⁵ Local elites, who generally have more financial resources and better means to work with external actors, can drive national initiatives for their own benefits at the expense of poor and marginalised groups within the community.²⁶ Additionally, the individual choice of resource access is not always for economic return, as considered in the model of common property literature;

22. Blaikie, Piers M. 1985. *The Political Economy Of Soil Erosion In Developing Countries*. London: Longman; Bryant, L. R. 2015. *Political Ecology: Handbook Topics And Theme*. In *The International Handbook Of Political Ecology*, 3-13. Cheltenham: Edward Elgar Publishing Limited; Turner, Matthew D. 2004. *Political Ecology And The Moral Dimensions Of "Resource Conflicts": The Case Of Farmer-Herder Conflicts In The Sahel*. *Political Geography* 23 (7): 863-889. (doi:10.1016/j.polgeo.2004.05.009).

23. Leach, Melissa, Robin Mearns, and Ian Scoones. 1999. *Environmental Entitlements: Dynamics And Institutions In Community-Based Natural Resource Management*. *World Development* 27 (2): 225-247. (doi:10.1016/s0305-750x(98)00141-7); Li, Tania Murray. 2002. *Engaging Simplifications: Community-Based Resource Management, Market Processes And State Agendas In Upland Southeast Asia*. *World Development* 30 (2): 265-283. (doi:10.1016/s0305-750x(01)00103-6).

24. Nygren, Anja. 2005. *Community-Based Forest Management Within The Context Of Institutional Decentralization In Honduras*. *World Development* 33 (4): 639-655. (doi:10.1016/j.worlddev.2004.11.002).

25. Zimmerer, Karl S., and Thomas J. Bassett. 2003. *Political Ecology: An Integrative Approach To Geography And Environment-Development Studies*. New York: Guilford Press.

26. Agrawal, A. 2005. *Environmentality: Technologies of Government and the Making of Subjects*. Durham: Duke University Press; Zulu, Leo Charles. 2012. *Neoliberalization, Decentralization And Community-Based Natural Resources Management In Malawi: The First Sixteen Years And Looking Ahead*. *Progress In Development Studies* 12 (2-3): 193-212. (doi:10.1177/146499341101200307).

instead, it can be a response to manipulation for political gain.²⁷ Poor leadership, uneven participation, corruption, and inadequate income alternatives are some examples of the main causes of failed community-based development programmes globally.²⁸

3.1. Community-Based Institutions

Institutions are “regularised patterns of behaviours between individuals and groups in society” with significant roles in mediating and shaping human-environment relations.²⁹ Institutions are contingent and dynamic, and are operated by human actions.³⁰ Institutions can be both formal and informal. Formal institutions refer to laws, the court system, regulations, organisational forms, hierarchical decision-making, and written contracts, whereas informal institutions are those of socially shared rules and practices, which are usually unwritten and communicated and enforced through unofficial

27. Turner, Matthew D. 2004. Political Ecology And The Moral Dimensions Of “Resource Conflicts”: The Case Of Farmer–Herder Conflicts In The Sahel. *Political Geography* 23 (7): 863-889. (doi:10.1016/j.polgeo.2004.05.009).

28. Blaikie, Piers. 2006. Is Small Really Beautiful? Community-Based Natural Resource Management In Malawi And Botswana. *World Development* 34 (11): 1942-1957. (doi:10.1016/j.worlddev.2005.11.023); Campbell, Bruce, Alois Mandondo, Nontokozi Nemarundwe, Bevyne Sithole, Wil De Jong, Marty Luckert, and Frank Matose. 2001. Challenges To Proponents Of Common Property Recourse Systems: Despairing Voices From The Social Forests Of Zimbabwe. *World Development* 29 (4): 589-600. (doi:10.1016/s0305-750x(00)00114-5); Li, Tania Murray. 2002. Engaging Simplifications: Community-Based Resource Management, Market Processes And State Agendas In Upland Southeast Asia. *World Development* 30 (2): 265-283. (doi:10.1016/s0305-750x(01)00103-6).

29. Leach, Melissa, Robin Mearns, and Ian Scoones. 1999. Environmental Entitlements: Dynamics And Institutions In Community-Based Natural Resource Management. *World Development* 27 (2): 225. (doi:10.1016/s0305-750x(98)00141-7); Cleaver, Frances Dalton, and Jessica De Koning. 2015. Furthering Critical Institutionalism. *International Journal Of The Commons* 9 (1): 1-18. (doi:10.18352/ijc.605); Krueger, R. 2007. Institutions. In *Society Encyclopedia Of Environment And Society*. California: SAGE Publications, Inc.

30. Cleaver, Frances Dalton, and Jessica De Koning. 2015. Furthering Critical Institutionalism. *International Journal Of The Commons* 9 (1): 1-18. (doi:10.18352/ijc.605); Krueger, R. 2007. Institutions. In *Society Encyclopedia Of Environment And Society*. California: SAGE Publications, Inc.

channels.³¹ Interactions between formal and informal institutions can result in unpredictable outcomes for policy intervention. In rural development and natural resource governance, negotiation and struggle can vary from material access and rights to “meanings, discourses, representation, participation, as well as individual identities,” and these forms of interactions need to be disentangled.³²

Community-based institutions should be established by community members and for the unity, harmony, prosperity, and wellbeing of the community. It is the role of each member to voluntarily participate in creating contractual agreements that are applicable to leaders and members of the community. Each member has an equal voice for the purposes of selection of community leaders, for the proper functioning of institutions, and on issues pertinent to the wellbeing of the community. Community leaders are those who are inspired to lead institutions for the interests of community members, and not for particular groups. The benefits from community initiatives should be equally shared among members, not just among local elites, who have the power and means to grab resources for personal gain. The strength and success of community institutions are largely determined by the community members.

31. Cleaver, Frances Dalton, and Jessica De Koning. 2015. Furthering Critical Institutionalism. *International Journal Of The Commons* 9 (1): 1-18. (doi:10.18352/ijc.605); Krueger, R. 2007. Institutions. In *Society Encyclopedia Of Environment And Society*. California: SAGE Publications, Inc.; Leach, Melissa, Robin Mearns, and Ian Scoones. 1999. Environmental Entitlements: Dynamics And Institutions In Community-Based Natural Resource Management. *World Development* 27 (2): 225. (doi:10.1016/s0305-750x(98)00141-7); Steer, Liesbet, and Kunal Sen. 2010. Formal And Informal Institutions In A Transition Economy: The Case Of Vietnam. *World Development* 38 (11): 1603-1615. (doi:10.1016/j.worlddev.2010.03.006); Stern, P. C., T. Dietz, N. Dolsak, E. Ostrom, and S. Stonich. 2002. Knowledge And Questions After 15 Years Of Research. In *The Drama Of The Commons*. Washington DC: National Academy Press.

32. Cleaver, Frances Dalton, and Jessica De Koning. 2015. Furthering Critical Institutionalism. *International Journal Of The Commons* 9 (1): 10. (doi:10.18352/ijc.605).

4. WHY DOES GENUINE COMMUNITY-BASED DEVELOPMENT MATTER?

Community-based development is about providing opportunities for individual community members to express their voices, make decisions, and take the lead in the development trajectory and actions that matter for their happiness and wellbeing. The benefits of such an approach are diverse, ranging from economic to cultural to spiritual aspects, and go beyond local community boundaries. The first important benefit that community-based development can offer is in addressing the challenges posed by the limited human and financial resources of state institutions in delivering public services to the entire population. The provision of these services is generally way behind in remote villages compared to in urban areas. Some challenges stemming from limited financial resources can be addressed by private sector investment and/or contributions from within communities or from outsiders when suitable mechanisms for fund mobilisation are in place. At the same time, it would be more cost efficient if some of the tasks managed by distant state bureaucrats are instead assigned to the local community, who engage directly with their localities as part of their livelihoods, i.e., local data collection, forest patrols, and local meetings.

The second benefit is the maximised utilisation of the potential of villages. Each village has unique characteristics, whether they are its geographical location, natural resource endowment, human capital, ecological and environmental knowledge, historical and cultural values, or social interactions. Finding village uniqueness is important, as most prescriptions of one-size-fits-all national policies – which generally do not capture the full pictures of local contexts – fail to respond to local needs and situations. These characteristics need to be clearly understood through comprehensive scientific and adaptive action research in order for development practitioners and villagers to design interventions that match local contexts and are able to explore the full potential of each village. When an enabling environment is established, as can be shown in numerous cases, community members are able to collectively act to identify the development potential based on the available natural and human capital. The necessary planning and implementation can be built upon this solid foundation.

The next key benefit of community-based development is local employment. Being able to identify the development potential of villages, such as

culture-based tourism, agriculture, fisheries, and small and medium-sized enterprises – by themselves or in combination – is important as these can be exploited to generate plenty of local jobs. This would reduce ex-migration for job opportunities in urban areas or overseas, and maintain the shape of the population pyramid, which is essential for long-term community development. This development approach is important for villagers' spirit, happiness, and enjoyment of earning income and staying close to their families and communities, embedded with meaning, identity, and a sense of belonging.

The fourth benefit of community-based development is local capacity building. Community-based development is cross-cutting and multi-disciplinary, and capacity-building programmes are diverse, depending on the needs of the community and nature of the projects being implemented. These trainings can be on modern equipment use for data collection, agriculture techniques, fish raising, water management, food hygiene and sanitation, hospitality, project management, financial accountability, local planning and leadership, and financial management, among others. Trainings can take place in different forms and places, from specific vocational trainings to hands-on project management, on-the-job trainings, study visits, and project piloting. Through various trainings and practices, local government officers and villagers will have a better understanding of and capacity to design and lead projects pertinent to local development.

The last key benefit is the sustainable and inclusive aspects of the community-based approach. There are myriad examples of participatory rural development projects not being maintained after the project ends. With genuine community-based development, in which projects are tailor-made and opportunities are given to local people to make decisions and take the lead from the outset of the projects – initially with some guidance from the project team – projects will be more sustainable. Local ownership, responsibility, and capacity building are key for project sustainability. With the majority of villagers participating in projects, benefit sharing and inclusiveness – including social, political, religious, racial, economic, and gender aspects – are also maintained. Buddhist temples and community gatherings are good showcases of how Cambodian local villagers contribute to their community whether in cash or in kind when they see the value of the projects. Even though local people are generally perceived as weak, they definitely have the leadership skills to work with outside actors, and means to achieve what is important to them.

Having discussed the significance of community-based development, it is vital to highlight the roles of key stakeholders in enabling or hindering the success of project implementation. Through policies, power, and historical events, each actor can exert their influence on decision-making regarding resource control and access.³³ These stakeholders range from state agencies to international and national NGOs, transnational and national corporations, community-based institutions, and individuals within communities.

With numerous and diverse actors, the capacity of community-based institutions remains weak. There is a need for the supporting roles of mediators, who should put a system in place that can enable community leaders to learn about and gradually take control of their development trajectory. Mediators play central roles for building networks with key actors to effectively undertake policy interventions.³⁴ It is the role of the mediators to connect actors at different individual nodes of community-based networks and to ensure that each actor acts to support and maintain the network, rather than work against it. Studies show that mediators are able to mobilise financial, technical, and political support, and provide assistance to those in need or experiencing difficulties when networks are challenged or put under pressure.³⁵ Mediators can also call for network members to embrace the success of their policy interventions, in order to persuade state decision-makers and new audiences to join the networks. These strategies and support mechanisms are key for network maintenance.

33. Brown, John Christopher, and Mark Purcell. 2005. There's Nothing Inherent About Scale: Political Ecology, The Local Trap, And The Politics Of Development In The Brazilian Amazon. *Geoforum* 36 (5): 607-624. (doi:10.1016/j.geoforum.2004.09.001); Zulu, Leo Charles. 2012. Neoliberalization, Decentralization And Community-Based Natural Resources Management In Malawi: The First Sixteen Years And Looking Ahead. *Progress In Development Studies* 12 (2-3): 193-212. (doi:10.1177/146499341101200307).

34. Mahanty, Sanghamitra. 2002. Conservation And Development Interventions As Networks: The Case Of The India Ecodevelopment Project, Karnataka. *World Development* 30 (8): 1369-1386. (doi:10.1016/s0305-750x(02)00039-6).

35. Mahanty, Sanghamitra. 2002. Conservation And Development Interventions As Networks: The Case Of The India Ecodevelopment Project, Karnataka. *World Development* 30 (8): 1369-1386. (doi:10.1016/s0305-750x(02)00039-6); Keo, Piseth. 2018. Discourses, Institutions, And Power: Political Ecology Of Community-Based Natural Resource Management In Cambodia. Phnom Penh: National University of Cambodia.

5. AN EXAMPLE OF GENUINE COMMUNITY-BASED DEVELOPMENT: TECHO 100 VILLAGES PROJECT

TECHO 100 Villages was proposed by the Royal Government of Cambodia during the Asian Cultural Council launching event on 14 January 2019, as a demonstration of a genuine community-based development model. It is a culture-based development project guided by Technology (T), Education (E), Cooperation (C), Humanity (H), and Ownership (O), for sustainable and inclusive rural development. The focus of the project is community ownership and leadership. For instance, sustainable development builds on the notion that villagers are provided the opportunities to choose what is best for their livelihoods, household income generation, and religious and cultural practices. Economic, political, cultural, and gender inclusiveness are key guiding elements. Every single phase of the project needs to ensure that villagers are the leaders and owners of the project. The project strives to contribute to the achievement of the UN Sustainable Development Goals 2030. Community innovation provides villagers with the opportunities to make best use of their knowledge, skills, and talents for income generation and community development, while community benefits delivered to villagers should be maximised. Scientific and constant dialogues between the project team and villagers, and among villagers, are in place. More details of the TECHO 100 Villages Project can be found in the Annex.

6. CONCLUSION

To summarise the above discussion, this paper argues that with direct contact and ecological and environmental knowledge, local communities are in the most suitable position to make decisions and take the lead on matters pertinent to local development. Even though community members have diverse social, cultural, religious, economic, and political backgrounds – as well as multiple interests stemming from local resources – a sense of belonging to their land and social and cultural bonds are key for them to cooperate and act collectively for their wellbeing and prosperity. Providing genuine opportunities for local people to drive community development will help address the shortage of financial and human resources allocated by the government for public service delivery in rural areas, improve efficiency of service delivery,

create local employment, reduce ex-migration, build local capacity in a range of key areas essential for local development, and ensure the sustainability and inclusiveness of the project and development interventions. Genuine community-based development should be based on comprehensive studies of the localities, and the results of the studies should lay the foundation for the design of the project, and for the implementation and monitoring and evaluation processes. The whole process should be led by the local community, with certain assistance from project mediators (coordinators), until villagers are capable of managing and taking full control of the projects. The 100 Model Villages project, which was proposed by the Cambodian government in January 2019, is a good example of such a project.

Annex

A Brief Summary of the TECHO 100 Model Villages Project: An Example of Genuine Community-Based Development

I. Goal

1. "To build sustainable, inclusive, and resilient villages, where people live quality and happy lives in harmony with their environment."

II. Objectives

1. To pilot the new innovative conceptual model – TECHO – in 100 Cambodian villages nationwide.
2. To promote grassroots global development utilising the Cambodian innovative approach of development through learning and sharing with other Asian countries.
3. To develop local economies that are culturally and spiritually rich.
4. To provide the necessary development assistances to Cambodian villages.
5. To contribute to the achievement of the global Sustainable Development Goals.

III. Modalities

1. The model is promoted under the slogan "Cultivating potential wealth in the land and growing diamonds," providing new opportunities for the grassroots, who have abundant, invaluable knowledge and capacity to identify and ensure the sustainability of development interventions, and to take control of the project in which they are the primary owners and beneficiaries. While the local economy is developed, people will remain culturally and spiritually rich.
2. By making villages charming to villagers through different means of income generation opportunities, this project will help stabilise and maintain village demographic shapes and increase local populations.

An increase in local populations will lay strong foundations for poverty alleviation, economic growth, and village development.

3. The project is a key vehicle to promote Public-Private-Partnership (PPP), which is a catalyst for building more effective and efficient public institutions and active local participation.
4. The following are the working guidelines and principles of the PPP under this project:
 - 1) Culture-based: This focuses on a range of cultural aspects ranging from historical and traditional artefacts, weaving, handicrafts, dance, arts, and music. Some villages have 100 per cent of cultural aspects, while others have only certain elements of culture.
 - 2) Decentralisation-governance: This project focuses both on strengthening the governance capacity of local authorities, and developing individual capacity to participate and lead village development activities.
 - 3) Community innovation: The focus is to provide villagers with the opportunities to make best use of their knowledge, skills, and talents for income generation and community development.
 - 4) Sustainable development: This builds on the notion that villagers are provided the opportunities to choose what is best for their livelihoods, household income generation, and religious and cultural practices. Economic, political, cultural, and gender inclusiveness are key guiding elements. Every single phase of the project needs to ensure that villagers are the leaders and owners of the project. The project strives to contribute to the achievement of the UN Sustainable Development Goals 2030.
 - 5) Community benefits: Benefits delivered to villagers should be maximised.
 - 6) Scientific research-based and innovative approach: Scientific and constant dialogues between the project team and villagers, and among villagers, are in place.

- 7) Human resource development: Participation in the project will be part of human development, and the skills acquired will be passed down to the next generation. Specific activities from the project include educational and capacity-building programmes for villagers through vocational trainings and practices, participation in village studies, exchange visits, and other activities.
- 8) Village life health improvement to the agreed international standard of living from the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and other international organisations.
- 9) Technology transfer: Advanced technology will be transferred, where applicable, to the villages.
- 10) Sustainable financing (both domestic and overseas financing): Sustainable financial mechanisms will be put in place.
- 11) Small and medium-sized enterprises (family-based industries) will be promoted in the villages.
- 12) Environment and resources oriented: Water, forests, fisheries, and other resources with potential for income generation, local livelihoods, and rural development.

IV. Methodologies

1. The geographical scope of the pilot project is 100 villages in all 25 provinces of Cambodia (four villages in each province), to ensure nationwide awareness and direct involvement by the whole community. Additional villages over the 100 villages will also be taken up.
2. As highlighted above, the broad methodology of the project is *culture-based and grassroots-driven*, with tasks mainly led and managed by local people throughout the project cycle, from data collection, planning, and implementation, to monitoring and evaluation with support from the national and sub-national governments as deemed appropriate.

3. The initial and essential stage of the project is to collect comprehensive and detailed baseline information through an initial survey in four villages before rolling out at full scale to the 100 villages in the pilot phase. The survey will (1) provide basic information to define the scopes of the project, and (2) be used as a benchmark to measure the impacts of the projects. Local people will lead the process and training will be provided to local people by experts from different fields to ensure that the data being collected can be utilised for both quantitative and qualitative meta-analysis
4. The survey requires ample time and attention, and will take stock of the geographic, geological, ecological, and socio-economic characteristics of each village. The following are some of the basic information to be collected:
 - 1) Culture;
 - 2) History;
 - 3) Socio-economics (incomes, education, skills, etc.);
 - 4) Public services (water, electricity, hospitals, schools, vocational training centres, etc.);
 - 5) Tourism;
 - 6) Industries;
 - 7) Food, agriculture, and potential for animal husbandry;
 - 8) Environment and resource endowments (number of fish ponds, availability of soil for agriculture, forestry);
 - 9) Irrigation systems and rainfall (precipitation) level;
 - 10) Soil quality;
 - 11) Market access; and
 - 12) Connectivity to urban areas.

5. Trainings and direct involvement will help local people understand the importance of data collection and its use for planning and to select appropriate interventions. The culture of constant dialogues between experts and villagers will be maintained in an effort to ensure that the data captures the full picture of development needs. It is expected that local people will have the capacity to initiate similar research during and after the completion of the project. Knowledge and skills acquired from the survey will be reflected and utilised in the next round of the 100 Model Villages project.
6. The survey will also offer the opportunity to identify local leaders with sound knowledge of their area and the capacity to learn new knowledge, whether for planning or implementing projects essential for their villages. More long-term training is essential for youth leaders and local planners to carry out similar activities in the subsequent stages of the 100 Model Villages project, which will continue on a rolling basis.
7. Upon the completion of data collection and analysis, the findings will be presented to the whole village. A series of discussions with villagers on alternative directions will be held before arriving at final recommendations on whether, for example, to move into cultural and ecotourism development, cash crop expansion, animal husbandry, handicraft making, creating markets for non-timber forest products, micro-hydropower development, environmental protection, cultural heritage conservation or other possible projects. In addition, discussions will be held and guidance provided regarding strategies to maximise the likelihood of the project being successful, such as marketing and financial management.
8. During the survey and process of deciding the project scope and viability, the project aims to establish a financial mechanism for supporting potential projects for village development. The projects have to be structured in a way that provides economic opportunities for the individuals and groups involved in the investment and implementation of the project.

9. At the implementation stage, *villagers will take a lead in managing their projects*, with terms of reference developed for the local project team, which includes representation primarily from villagers and concerned agencies at the sub-national level. National level project teams will be available to give advice and ensure that the project is following the agreed or expected course. Amendments can be introduced as deemed necessary. The project team will play a role in providing guidance, ensuring transparency of financial management, helping to resolve conflicts, coordinating with different stakeholders, and undertaking other tasks that are beyond the capacity of villagers.
10. Project monitoring and evaluation will be conducted by villagers with guidance from the project team, enabling villagers to assess progress made based on benchmark survey data. This process is essential for identifying challenges and necessary solutions that are adapted to and practical for prevailing local circumstances. This exercise will help build the capacity of villagers, and give them a *sense of ownership, responsibility, and pride* over the project, which has the character of being locally designed and implemented. The project also strives to promote the role of women in local development in the planning, implementation, and decision-making process.
11. At the end of the project, it is expected that villagers will have sufficient knowledge and capacity to conduct follow-up surveys and manage different kinds of development projects in their localities.
12. Village Selection Criteria: There are a number of criteria being considered, namely:
 - 1) Culture-based (both tangible and intangible);
 - 2) Geographical locations (access to main roads and market places);
 - 3) Number of households (productivity of the work force);
 - 4) Local leadership; and
 - 5) Experiences of successful implementation of previous interventions (optional).

13. Infrastructure and economic development activities for creating potential growth centres in the long run.

Source: Asian Cultural Council and Civil Society Alliance Forum (2019): TECHO 100 Villages Project, Phnom Penh.

10

Smart Villages in ASEAN and the EU

Inclusion and Sustainability
through Smart Interventions
in Rural Areas

**Linda Calabrese | Kim Giang Do |
Ratanak Khun | Sherillyn Raga**

Abstract

This paper conducts a comparative analysis at the regional and country level on the differences in motivations and interventions (including policy frameworks, development targets/objectives and funding mechanisms) on supporting smart villages in ASEAN and the EU. The analysis shows that approaches to improving villages are focused on improving rural employment and incomes for ASEAN, while addressing depopulation in rural areas is a key motivation to support smart villages for the EU. While different in their approaches, there are several lessons which can be learned from both regions, and from selected case studies (Germany, Italy, Malaysia and the Philippines). For instance, ASEAN may learn from the EU's efforts in institutionalising a own common framework and earmarking regional funds to support smart villages in member states; and on the country level, on expanding access to technology and finance in rural villages in a sustainable way. Meanwhile, the EU may gain insights on country-level government interventions on supporting rural community livelihoods and tourism that contributed to positive impacts on jobs and income in rural communities (Malaysia), as well as project-level tailoring measures according to the existing knowledge of both recipients and implementers (the Philippines). A collaborative effort between the two blocs could help develop the smart village concept further in ASEAN.

1. INTRODUCTION

Despite considerable progress in many parts of the world, the gap between urban and rural areas persists, both in terms of economic measures (such as income and wages)¹ and social outcomes such as health,² education³ and gender.⁴ Rural areas have been affected by the twin challenges of social and environmental sustainability.

As a solution to the urban-rural gap, many countries have resorted to smart villages as a solution. Across the world, smart villages have been developed in an attempt to make human settlements more sustainable and ready to cope with issues such as inequality of energy access between cities and

1. Lagakos, David. 2020. Urban-Rural Gaps in the Developing World: Does Internal Migration Offer Opportunities? *Journal of Economic Perspectives*, 34 (3): 174-92. (doi: 10.1257/jep.34.3.174).

2. Yaya, S., Uthman, O.A., Okonofua, F. et al. 2019. Decomposing the rural-urban gap in the factors of under-five mortality in sub-Saharan Africa? Evidence from 35 countries. *BMC Public Health* 19, 616. (doi:10.1186/s12889-019-6940-9); Wu Jinjing, Kc Samir, Luy Marc. 2022. The Gender Gap in Life Expectancy in Urban and Rural China, 2013-2018. *Frontiers in Public Health*. 2022 February 11;10:749238. (doi: 10.3389/fpubh.2022.749238).

3. Bertolini, P. 2019. Overview of income and non-income rural poverty in developed countries. Presentation to the Expert Group Meeting on Eradicating Rural Poverty to Implement the 2030 Agenda for Sustainable Development, 27 February-1 March 2019. Addis Ababa: United Nations Economic Commission for Africa.

4. Singh, S. P. and Ningthoujam, Y. 2022. Gender Wage Gap in Rural Labour Markets: An Empirical Study of North East India. *The Journal of Asian Finance, Economics and Business*. Korea Distribution Science Association, 9(6), pp. 151–158. (doi: 10.13106/JAFEB.2022.VOL9.NO6.0151).

villages,⁵ the effects of climate change on food and social security,⁶ and the advancement of information technologies.⁷

While now commonly found in many areas and regions, the concept of “smart villages” means different things in different parts of the globe. There is no single definition of smart villages, given the variety of communities, their different needs and objectives, and the different “smart” solutions they apply to achieve these.⁸ In general, however, a village is “smart” when it applies new solutions and technologies, and in particular digital tools, to address economic, social and environmental issues. Solutions commonly adopted by smart villages include energy-efficient technologies, open government and Information and Communication Technology (ICT) innovation, among others.

Smart villages are relevant to the United Nations 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs). Smart villages may contribute to the objectives of ending poverty and reducing inequality, providing affordable and clean energy, building sustainable cities and communities, and ensuring good health and well-being.

In some countries and regions, smart villages focus on addressing the lack of basic infrastructure (electricity, water supply, internet access, etc.). In Europe, where basic infrastructure is present, smart villages tend to address social, economic, and environmental challenges. Smart villages in Europe aim to provide services that may help attract and maintain people in

5. Heap, B. and Hirmer, S. 2020. Smart Villages. *Horizons: Journal of International Relations and Sustainable Development*, (15), pp. 290–305.

6. Ferrer, A.J. et al. 2018. Analyzing farm household strategies for food security and climate resilience: The case of Climate-Smart Villages of Southeast Asia. Working Paper 248. CGIAR. Available at: (<https://cgspace.cgiar.org/handle/10568/99100>). Accessed 4 April 2022; Mutabazi, K.D., Sieber, S., Maeda, C. et al. 2015. Assessing the determinants of poverty and vulnerability of smallholder farmers in a changing climate: the case of Morogoro region, Tanzania. *Regional Environmental Change* 15, 1243–1258. (<https://doi.org/10.1007/s10113-015-0772-7>).

7. Kim, H. S., and Lee, E. Y. 2010. Narrowing the digital infrastructure divide among cities and rural areas. 12th International Conference on Advanced Communication Technology (Vol. 74). South Korea: IEEE Communications Society Press.

8. Zavrtnik, V., Kos, A. and Stojmenova Duh, E. 2018. Smart Villages: Comprehensive Review of Initiatives and Practices. *Sustainability*, 10(7). (doi:10.3390/su10072559).

rural communities, so as to avoid depopulation of the European countryside.⁹ Typical services include transport, mobility and digitalisation, but there are also several measures aimed at revitalising rural social and economic activities in general. Conversely, in Southeast Asia, smart villages are aimed at supporting rural areas, particularly under the ASEAN Framework on Rural Development and Poverty Eradication, but the “smart” measures adopted are not always related to digitalisation. Compared to their European Union (EU) counterparts, smart villages in Asia address issues of climate adaptation, health and education, and job and income generation; and to achieve these goals, they deploy a variety of solutions, as will be shown in Section 4 in this study.

This study aims to provide a comparative analysis of the motivations and interventions to support smart villages in Asia and Europe, in the context of the Association of Southeast Asian Nations (ASEAN) countries and the European Union. The study shows that there are key differences in the way countries in the two blocs use smart villages as a tool to address the urban-rural gap. These differences stem not only from the different economic and social contexts of the countries in the two blocs, but also from the institutional arrangements of the blocs themselves. To clarify, while the EU is a union among member countries, with its own budgetary resources and arrangements, ASEAN is an intergovernmental organisation. Therefore, while in the former, countries adopt a uniform approach to smart villages, and they draw from a common budget, in the latter, countries develop their own approach based on the specific needs, and use their own resources to fund the measures they implement.

This study is structured as follows. Section 2 presents the methodology for this study. Section 3 provides a brief review of the literature on the concept and development of smart villages in ASEAN and the EU, at the regional level. Section 4 presents national projects or initiatives on smart villages, based on case studies in Italy, Germany, Malaysia and the Philippines. Section 5 summarises the findings and concludes.

9. Ibid.

2. METHODOLOGY

The study adopts a qualitative research approach to identify the motivations and the associated interventions by ASEAN and the EU to support the development of smart villages in the respective regions. The authors conducted a review of recent academic literature, key policy documents and country case studies in both regions as a methodological approach for this paper. The authors also reviewed official statements and documents from the EU and ASEAN.

The work provides an analysis of four case studies, two from the EU (Italy, Germany) and two from ASEAN (Malaysia and the Philippines). These are selected as they represent the variety of initiatives and measures adopted on the ground.

Through the comparative analysis of policy frameworks and interventions from ASEAN and the EU, this study highlights lessons which can help inform policymakers and stakeholders in both regions to enhance the effectiveness of their support to smart villages.

3. INITIATIVES ON “SMART VILLAGES” AT THE ASEAN AND EU (REGIONAL) LEVEL

3.1. Supporting Villages at the ASEAN Level

“Smart villages” initiatives are present in several ASEAN countries, where they are used as a tool to address challenges related to service delivery, social issues and environmental sustainability. Take, for example, the issue of access to electricity. While cities are generally well-connected, providing electricity to remote rural areas is a challenge for many ASEAN countries. It is challenging to connect to the grid the communities living on remote islands in the Philippines or Indonesia, or those residing in the hilly jungles of Cambodia and Myanmar. Due to distinctive geographic constraints and high price of national grid extension, microgrid renewable energy (solar panels, wind turbines, combined heat and power generators) has been developed as one of the key solutions.

Electricity is a catalyst for community-led development as it enables the integration of healthcare, education, access to clean water, sanitation and nutrition, the growth of small and mid-sized enterprises, enhanced food and social security, gender equality, environmental protection, and participatory democracy.¹⁰ The demand for electric power in ASEAN is increasing at the fastest rates in the world due to its growing economies and the rise of middle classes. Despite this, the International Energy Agency estimates that 33 million people (5 per cent of the population) do not have access to electricity as of 2022, most of whom are living in remote areas. The smart village model can improve the balance of energy access for these areas.

Much literature and policy initiatives have focussed on the so-called energy-rich smart villages.¹¹ For example, Singapore-based Nanyang Technological University initiated the Renewable Energy Integration Demonstrator-Singapore (REIDS) to bring more affordable access to energy to communities across the region, using microgrid technology.¹² Since 2016, REIDS has attracted multi-million-dollar investments from top companies to develop energy and microgrid technology and stations to serve the growing market in ASEAN.¹³ For instance, Indonesia's Bawah Island in the South China Sea has partnered with REIDS to develop offshore microgrid projects.¹⁴ In Cambodia, France's Total Solar Distributed Generation has partnered with Singapore-based developer Canopy Power Pte Ltd to develop a solar and storage hybrid microgrid on the remote island of Koh Rong Sanloem. The project includes a 1.25 megawatt-peak ground-mounted solar photovoltaic (PV) plant and a 2 megawatt-hour battery energy storage system integrated with diesel gen-

10. Holmes, J., Jones, B. and Heap, B. 2015. Smart Villages. *Science*. Vol. 350, Issue 6259. (doi: 10.1126/science.aad6521); Holmes, J. et al. 2017. The Smart Villages Initiative: Findings 2014-2017. *Smart Villages*. (https://e4sv.org/wp-content/uploads/2017/06/The-Smart-Villages-Initiative-Findings-2014-2017_web.pdf).

11. Heap and Hirmer. 2020.

12. Choo, F. H. 2018. Renewable energy integration demonstrator - Singapore's presentation at the Isolated System Power Connect Conference, 15-19 October. (http://www.ipsconnect.org/wp-content/uploads/2018/11/IPS_Choo_PDF.pdf).

13. NTU - Nanyang Technological University. 2016. NTU Singapore to build an offshore integrated system of renewable energy sources. NTU business announcement via (<https://www.eurekalert.org/news-releases/724367>).

14. *Ibid.*

erators and a smart controller, making it one of Southeast Asia's largest off-grid renewable energy microgrids.¹⁵

But smart villages are not only about energy; access to water is also vital. Irrigation for agriculture, for example, depends on water quality and storage, which require access to both energy and water. Hydropower production, water purification and pumping, distribution and sanitation also require energy and water. Therefore, the energy and water nexus is a key issue for smart villages in Southeast Asia.¹⁶

Other recent studies propose climate-smart villages as a solution to climate change.¹⁷ Food security is already being negatively affected by climate change increasing temperatures, changing precipitation patterns, and causing a greater frequency of some extreme events, and is expected to be increasingly affected by future climate change.¹⁸ Several studies have provided evidence that rural areas are especially being affected by climate change, through the impact on agricultural livelihoods, income, and employment.¹⁹ Smart villages seek to produce and use biomass in ways that are sustainable and renewable, do not deplete resources, and utilise them efficiently.

Finally, some studies discuss the importance of the adoption of new technologies in rural communities across the Southeast Asian region, particularly among farmers. While these technologies can be beneficial, rural villagers also face challenges that prevent their adoption, such as limited knowledge,

15. Thou, V. 2020. Clean energy microgrid in pipeline for Koh Rong Sanloem. News, 2 December. The Phnom Penh Post. (<https://www.phnompenhpost.com/business/clean-energy-microgrid-pipeline-koh-rong-sanloem>).

16. Smart Villages Initiative. 2016. The energy and water nexus for off-grid communities in the Philippines and Southeast Asia. Workshop Report 21. Cambridge: Smart Villages.

17. Vidallo, R., Bayot, R., Rosimo, M., Monville-Oro, E., Gonsalves, J., Ilaga, A., Sebastian, L., Manalo, U. and Baltazar, P. 2019. The AMIA Experience: Supporting local actions for Climate Resilient Agriculture. Systems-Wide Climate Change Office, Department of Agriculture. (<https://cgspace.cgiar.org/bitstream/handle/10568/106787/Synthesis%20Brief.pdf>).

18. Mbow, C. et al. Food Security. Retrieved from (<https://policycommons.net/artifacts/458644/food-security/1431487/> on 21 Nov 2022. CID: 20.500.12592/1c7jw6).

19. Ibid.

small farm size, and lack of financial capital and support.²⁰ For instance, reliable access to the internet is one of the most important components of implementing smart villages. Malaysia's smart villages project, implemented in August 2019 to boost internet access and improve educational services in small villages by powering smart classrooms and digital libraries, is one example of a project that uses the internet to improve access to knowledge.

ASEAN's work on improving villages is embedded in its overarching objective of developing rural areas as a means to eradicate poverty. In 2012, the ASEAN Ministers on Rural Development and Poverty Eradication (AMRDPE) adopted a framework initiating its plan of action on rural development and poverty eradication, which aims to promote "the development of progressive, prosperous, and self-reliant rural communities, and thus contribute towards creating a caring society in the ASEAN member countries".²¹ The drive to support villages in rural areas may be partly driven by the large share of rural populations in ASEAN. As of 2020, while Singapore, Brunei Darussalam, and Malaysia are highly urbanised, the share of population living in rural areas is almost half in Indonesia (43 per cent) and Thailand (49 per cent), and more than half in the Philippines (53 per cent), Lao PDR (63 per cent), Myanmar (69 per cent) and Cambodia (75 per cent).²² As of November 2021, the Senior Officials on RDPE are tasked by the AMRDPE to collaborate with relevant ASEAN sectoral bodies and ASEAN's partners to implement the ASEAN Framework Action Plan on RDPE 2021-2025 and to develop an ASEAN master plan on rural development that reflects a whole-of-ASEAN approach to rural development and poverty eradication.²³

20. Razak, N.A., Malik J.A., and Saeed, M. 2013. A Development of Smart Village Implementation Plan for Agriculture: A Pioneer Project in Malaysia. Proceedings of the 4th International Conference on Computing and Informatics, ICOCI 2013 28 -30 August, 2013 Sarawak, Malaysia. Universiti Utara Malaysia. CORE Paper No. 024 (<https://core.ac.uk/download/pdf/42979417.pdf>).

21. ASEAN Secretariat. 2012. Ministerial Understanding on ASEAN Cooperation in Rural Development and Poverty Eradication. (<https://asean.org/ministerial-understanding-on-asean-cooperation-in-rural-development-and-poverty-eradication/>).

22. Based on World Development Indicators accessed on 19 May 2022.

23. ASEAN. 2021. Joint Statement of The Twelfth ASEAN Ministers Meeting on Rural Development and Poverty Eradication. 26 November. (https://asean.org/wp-content/uploads/2022/02/Joint-Statement-12th-AMRDPE_adopted-1.pdf).

The Plan of Action is updated every five years, and its objectives align with those of smart villages. The latest Action Plan (2021-2025) is explicitly congruent with planned policies, projects and programmes at the national level of ASEAN members, which are expected to link national and regional initiatives with national actions.²⁴ The Plan also has a monitoring and evaluation component, which is to be reviewed by the Senior Officials on RDPE on an annual basis.²⁵

The Plan of Action 2021-2025 has five strategic objectives:

1. Fastrack rural transformation to enable participation in socio-economic opportunities
2. Ensure access to education, social services and healthcare towards enhanced welfare and healthy lifestyle in rural communities
3. Institutionalise disaster preparedness programmes to environment and climate change risks towards resilient communities and households
4. Good governance, institutionalised mechanisms and processes to strengthen convergence of rural development and poverty eradication initiatives
5. Institutionalised multi-stakeholder rural development mechanisms especially for rural women and youth participation, and other vulnerable sectors.

Specific activities in the Action Plan which are related to key features of smart villages (e.g., digitalisation, increasing climate change resilience) include:

24. ASEAN. 2022. ASEAN Framework Action Plan on Rural Development and Poverty Eradication 2021-2025. (<https://asean.org/book/asean-framework-action-plan-on-rural-development-and-poverty-eradication-2021-2025/>).

25. Ibid.

- Improving the knowledge management system for natural resource management and climate change adaptation and mitigation in support of rural development and poverty eradication
- Conducting regional workshops on optimising digital/smart villages in revitalising the village economy
- Conducting a study on the adoption of digitalisation among rural women entrepreneurs
- Sharing of experiences in developing models of digital transformation and smart new rural construction

ASEAN-level initiatives on RDPE, including support to villages, are funded by non-binding cost-sharing arrangements among member countries and through funding mobilisation from ASEAN dialogue partners, international organisations and the private sector. The Senior Officials, with the support of the ASEAN Secretariat, is responsible for mobilising and managing the resources required to implement the work plan.²⁶ As approved by the Senior Officials, ASEAN development cooperation funds and other forms of resources may also support the implementation of specific development cooperation projects. However, the latest Action Plan does not indicate specific earmarked funds (at the regional level or country allocation) or the total financing needed for implementation of the Action Plan.

3.2. Supporting Smart Villages in the EU

Rural areas are important for the EU. Rural and peri-urban²⁷ areas account for over 90 per cent of the EU territory, hosting 60 per cent of its population

26. Ibid.

27. Based on EU definition, peri urban areas are “areas that are in some form of transition from strictly rural to urban. These areas often form the immediate urban-rural interface and may eventually evolve into being fully urban”. (https://inspire.ec.europa.eu/codelist/SupplementaryRegulationValue/7_1_4_7_PerUrbanAreas:1).

and producing 43 per cent of its gross value added.²⁸ Unfortunately, rural areas lag behind cities in terms of socioeconomic indicators, and often lack adequate digital access.²⁹ Among the main challenges affecting rural areas in the EU are depopulation and rural exodus, in particular of the youth, who leave the countryside in favour of cities.³⁰ To address this issue, EU policy-makers aim to ensure that rural areas and communities remain attractive places to live and work in by improving access to services and opportunities for rural citizens, and fostering entrepreneurship in both the traditional and modern sectors of the economy. Moreover, EU funding for non-agricultural activities in rural areas has declined in 2014-2020, possibly widening the gap with cities.³¹

In the EU, smart villages are a tool to maintain rural areas' attractiveness, by addressing economic and social challenges using digital and social innovation to improve the quality of life.³² Smart villages are defined as "rural areas and communities which build on their existing strengths and assets as well as on developing new opportunities. In Smart Villages, traditional and new networks and services are enhanced by means of digital, telecommunication technologies, innovations and the better use of knowledge for the benefit of inhabitants and business".³³ The first part of the definition suggests that given the diversity and uniqueness of rural areas across Europe, different solutions are used, in line with the specificity of each location. The idea is that communities would be able to define for themselves what solutions to adopt, rather than be imposed with uniform policies from outside.³⁴

28. Kirketerp de Viron, C. and Mudri, G. 2019. Integrated Approach to Sustainable EU Smart Villages Policies. In Visvizi, A., Lytras, M.D., and Mudri, G. (eds.). *Smart Villages in the EU and Beyond*. Emerald Publishing Limited, pp. 13-27. (doi:10.1108/978-1-78769-845-120191003).

29. Komorowski, Ł. and Stanny, M. (2020) "Smart Villages: Where Can They Happen?", *Land*, 9(5). (doi:10.3390/land9050151).

30. Visvizi, A. and Lytras, M.D. 2018. It's Not a Fad: Smart Cities and Smart Villages Research in European and Global Contexts. *Sustainability*, 10(8). (doi:10.3390/su10082727).

31. Kirketerp de Viron and Mudri. 2019.

32. Ibid.

33. European Commission. 2017. EU Action for Smart Villages. Available at: (https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/key_policies/documents/rur-dev-small-villages_en.pdf (Accessed: 28 August 2021).

34. Zavrtnik, Kos and Stojmenova Duh. 2018.

To be “smart”, European villages need to display a few characteristics:³⁵

- They need to use digital technologies to achieve their goals;
- They need to think “outside of the rural context” and root their actions in their links to surrounding rural areas and cities;
- They need to establish new forms of cooperation and new networks of stakeholders, including farmers and other rural actors, local governments, the private sector, and the community as a whole;
- They need to use independent thinking: rather than following a set model or solutions, they need to devise their own strategies based on the local reality.

The concept of smart villages finds its origin in the debates on rural development taking place in the EU, often revolving around the Common Agricultural Policy, Regional Policy, and Cohesion Policy.³⁶ In recent years, the Cork Declaration 2.0 (2016) on A Better Life in Rural Areas identifies the concerns about the state of rural areas in Europe, in particular rural exodus and youth drain. The Cork Declaration 2.0 paved the way for further discussion and solutions to these themes, including the Smart Villages agenda, stating that it is necessary to invest in rural areas, and to maintain them as attractive places to live and work in for people of all ages. In 2017, the Smart Village Initiative was launched by the European Parliament, and the EU Commission and the Parliament published the EU Action for Smart Villages.³⁷

Given the rural development focus of the concept of smart villages, the European Network for Rural Development (ERND) initiated work on “smart and competitive rural areas” in 2017, aiming to revitalise rural services

35. Wolski, O. and Wójcik, M. 2019. Smart Villages Revisited: Conceptual Background and New Challenges at the Local Level. In Visvizi, A., Lytras, M.D., and Mudri, G. (eds.). *Smart Villages in the EU and Beyond*. Emerald Publishing Limited, pp. 29–48. (doi:10.1108/978-1-78769-845-120191004).

36. Visvizi, A., Lytras, M.D. and Mudri, G. 2019. Smart Villages: Relevance, Approaches, Policymaking Implications. In Visvizi, A., D. Lytras, M., and Mudri, G. (eds.). *Smart Villages in the EU and Beyond*. Emerald Publishing Limited (Emerald Studies in Politics and Technology), pp. 1–12. (doi:10.1108/978-1-78769-845-120191002).

37. European Commission. 2017.

(health, social services, education, energy, transport, retail) through Information and Communication Technology tools and through community-led actions and projects.³⁸ In 2018, the Bled Declaration for a Smarter Future of the Rural Areas in EU acknowledged the potential of the digital economy, if developed in an innovative, integrated and inclusive way, to contribute to tackling the current depopulation of rural areas; and proposed actions to develop the rural economy and provide opportunities for the youth to remain in rural areas. Examples included the use of precision agriculture to boost rural incomes,³⁹ the adoption of renewable energy and microgrid solutions to improve energy access,⁴⁰ the supply of public services such as health and transport, the use of digital solutions in governance such as e-administration, digitisation of town and city planning, and the support to rural enterprises.⁴¹

The EU also launched the Action for Smart Villages, an initiative which frames policies, tools, and instruments supporting smart villages through both financial and non-financial means.⁴² Smart villages can also draw funding from several additional EU mechanisms. The EU Rural Development policy 2014–2020, under the EU Common Agricultural Policy, is worth over €150 billion when taking into account member states' contributions. The majority of these funds, however, are devoted to agriculture, and only a little over €23 billion are allocated to other activities, such as services provision to rural areas.⁴³ These funds provide a set of tools for smart villages, such as measures on knowledge transfer, investment in physical assets, farm and business development, basic services and village renewal, cooperation, and

38. ENRD - European Network For Rural Development. 2017. Smart Villages, The European Network for Rural Development (ENRD) - European Commission. Available at: (https://enrd.ec.europa.eu/enrd-thematic-work/smart-and-competitive-rural-areas/smart-villages_en). Accessed 27 August 2021; Zavrtnik, Kos and Stojmenova Duh. 2018.

39. Azevedo, D. 2019. Precision Agriculture and the Smart Village Concept. In Visvizi, A., Lytras, M.D., and Mudri, G. (eds.). *Smart Villages in the EU and Beyond*. Emerald Publishing Limited, pp. 83–97. (doi:10.1108/978-1-78769-845-120191007).

40. Watson, J.K.R. 2019. Energy Diversification and Self-sustainable Smart Villages. In Visvizi, A., Lytras, M.D., and Mudri, G. (eds.). *Smart Villages in the EU and Beyond*. Emerald Publishing Limited, pp. 99–109. (doi:10.1108/978-1-78769-845-120191008).

41. Komorowski and Stanny. 2020.

42. Wolski, O. 2018. Smart Villages in EU Policy: How to Match Innovativeness and Pragmatism? *Więś i Rolnictwo*, 4(181), pp. 163–179. (doi:10.7366/wir042018/09).

43. Kirketerp de Viron and Mudri. 2019.

using a bottom-up, area-based approach to devise and implement development solutions.⁴⁴

Moreover, the smart villages can access funding beyond the European Agricultural Fund for Rural Development. Other sources of support include the European Regional Development Fund and Cohesion Fund, supporting research and innovation, business competitiveness, investment in the fields of the environment, transport, urban-rural linkages, and administrative capacity, among others. Horizon 2020, the EU Framework Programme for Research and Innovation, can support smart villages under its *rural renaissance* objective. The Connecting Europe Facility fund supports the development of trans-European networks in the fields of transport and digital services, and can thus support some of the objectives of the smart villages.⁴⁵

The above review highlights the key differences between the EU's and ASEAN's ways of supporting villages in rural areas, based on motivations that are shaped by contextual realities (e.g., large population lacking infrastructure and economic opportunities in most rural areas in ASEAN; declining population in rural areas in EU, with existing basic infrastructure that can be leveraged for innovative services). Table 1 outlines the key differences between ASEAN and the EU in terms of definitions of smart/rural villages, regional-level initiatives and objectives, and sources of funding for supporting smart/rural villages. The next section provides specific case studies of approaches to smart/rural villages in Italy, Germany, Malaysia and the Philippines.

44. Ibid.

45. Wolski. 2018.

Table 1. EU and ASEAN definitions of and support to smart villages.

| | ASEAN/Asia | European Union |
|--------------------------|---|---|
| Definition/ concept | <i>ASEAN's efforts on improving villages is embedded in its overarching regional cooperation for "...progressive, prosperous, and self-reliant rural communities to eradicate poverty..." (ASEAN Secretariat website). Typical strategies include developing infrastructure, "one town, one product", social safety nets and microfinance, climate-responsive agricultural practices.</i> | <i>"...rural areas and communities which build on their existing strengths and assets as well as on developing new opportunities. In Smart Villages, traditional and new networks and services are enhanced by means of digital, telecommunication technologies, innovations and the better use of knowledge for the benefit of inhabitants and business..." (European Commission, 2017, p. 3).</i> |
| Key regional initiatives | Since 1998, ASEAN's effort on improving villages is embedded in the initiatives of ASEAN Ministers for Rural Development and Poverty Eradication (AMRDPE). The AMRDPE meets periodically and an RDPE Plan of Action is being updated every five years. | In 2017, the Smart Village Initiative was launched by the European Parliament, and the EU Commission and the Parliament published the EU Action for Smart Villages. The EU Action for Smart Villages is a strategic approach, which frames policies, tools, and instruments to support smart villages. |
| Objectives | To implement cooperation, capacity-building, and information exchange on the following areas that can contribute to the progress and self-reliance of villages and poverty eradication: rural economic growth (e.g., "one sub-district, one product"); resources management; social protection and safety nets; development of infrastructure and human resources; public-private-people partnership; resilience of the poor and vulnerable groups to economic and environmental risks. | To support smart villages to help address the challenges associated with declining or sparse population in rural areas, including interventions covering public services, public management and private enterprises. Under the Smart Village Initiative, the EU recognises that digitisation is a key feature of smart villages but also allows EU members to have broad discretion on how to plan for and implement smart villages in their own countries. |

| | ASEAN/Asia | European Union |
|---------|---|---|
| Funding | <ul style="list-style-type: none"> • Funding of ASEAN-level initiatives are via non-binding cost-sharing arrangements among member countries and through funding mobilisation from ASEAN dialogue partners, international organisations and the private sector. • The ASEAN+3 village exchange programme (VLEP) started in 2013. The VLEP has mostly been hosted by China, and includes knowledge-sharing activities and field visits to successful villages in China. The programme is being supported by the ASEAN Secretariat, UNDP, ADB. | <p>The EU supports EU member states' smart villages through both financial and non-financial means. Smart villages can also draw funding from several additional EU mechanisms, such as:</p> <ul style="list-style-type: none"> • EU Rural Development policy under the EU Common Agricultural Policy • European Agricultural Fund for Rural Development • European Regional Development Fund and Cohesion Fund • EU Framework Programme for Research and Innovation • Connecting Europe Facility |

4. CASE STUDIES

This section presents case studies – two from the EU (Italy and Germany) and two from ASEAN (Malaysia and the Philippines) – to provide some lessons drawn from implementation of support and measures for smart/rural villages.

4.1. Smart Villages in the EU: The Italian National Strategy for Inner Areas

Italy's inner areas are rural areas situated far away from the main centres that provide services such as education, health and mobility. Inner areas make up 53 per cent of Italian municipalities and cover 60 per cent of the national territory, but only host 23 per cent of the Italian population (around

13.5 million people).⁴⁶ Inner areas have seen a decline in most socioeconomic indicators compared to the rest of the country: in recent years, they have faced a decline in population, and they have a higher share of people over 65 years old compared to the national average; rural employment has declined faster than in the rest of the country, and agricultural productivity has grown slower; moreover, these areas are more affected by the digital divide, with a smaller percentage of their population connected to broadband services. These factors contribute to farm abandonment and depopulation, and the quality of services available in these areas is affected by the digital divide. However, inner areas still host considerable environmental and cultural resources, and can therefore constitute valuable assets for the country.⁴⁷

To respond to these challenges, in 2014-2020 Italy has put in place a National Strategy for Inner Areas (NSIA). This policy aims to contribute to economic and social recovery, creating jobs, fostering social inclusion and reversing the demographic decline and the ageing of the population of inner areas all over the country. The policy is supported by all the main EU funds, as well as dedicated funding provided for under the Stability Law, which draws from national funding.⁴⁸

The NSIA is based on four main features:⁴⁹

1. Parallel improvements in services and investments in selected local development initiatives: national funds are deployed to improve basic services (education, transport, healthcare); whereas EU funds finance local development initiatives (land management and forests; local food products; renewable energy; natural and cultural heritage; and traditional crafts and SMEs).
2. A national dimension and multi-level governance: while inner areas are a national priority, the strategy applies a multi-level framework, involving national, regional and local tiers. Local communities

46. ENRD. 2018a. Strategy for Inner Areas - Italy. Working document. ENRD. Available at: (https://enrd.ec.europa.eu/sites/default/files/tg_smart-villages_case-study_it_0.pdf). Accessed 13 September 2021.

47. Ibid.

48. Ibid.

49. Ibid.

play a fundamental role, assessing the characteristics and complexity of the local needs and turning them into projects.

3. Multi-fund approach: drawing financial support from all the available European Structural and Investment funds (ERDF, ESF, EAFRD, EMFF) as well as from the National Stability Fund.

4. Participatory approach to local development: local participation is a key component of the strategy; each local strategy is elaborated by a group of mayors and requires cooperation between the municipalities involved in the project area.

Based on this approach, inner areas in various parts of the country have designed and implemented their own interventions. These include a community car-pooling initiative in Val Maira (Piedmont), based on a web platform and managed by a local community cooperative; remote classrooms in secondary schools in Beigua Sol (Liguria) and Piacenza-Parma Apennine (Emilia Romagna); equipping local pharmacies in Matese (Molise) with smart technologies to allow remote diagnostics by hospital personnel; and smart devices to allow inhabitants to monitor landslides and strengthen civil protection in Madonie (Sicily).⁵⁰

4.2. Smart Villages in Germany

The smart villages model in Germany centres around applying digital technology in countryside areas. Many projects support the deployment of digital tools in urban areas, but not so many for rural locations.⁵¹ In Germany, this divide is likely caused by demographic trends, which have seen an increase in urban population and a decrease in rural inhabitants in recent

50. Ibid.

51. Meyn, Mareike. 2020. Digitalization and Its Impact on Life in Rural Areas: Exploring the Two Sides of the Atlantic: USA and Germany. In Srikanta Patnaik, Siddhartha Sen, Magdi S. Mahmoud (eds.). *Smart village technology. Concepts and developments*, vol. 17. Cham: Springer (Modeling and Optimization in Science and Technologies, v. 17), pp. 99-116.

years.⁵² Population decline notwithstanding, German's rural areas are still the homes for 47 million citizens in 2016, making them an important sector for the growth of the country and thus, receiving special attention from politicians.⁵³ In particular, the German Federal Government has issued the *Digital Agenda*, which, on the one hand, highlights the significance of digital tools as a "fundamental technology trend," and, on the other hand, promotes equal living conditions in all areas across the country with the help of technology.⁵⁴

The Federal Programme for Rural Development (FPRD) invests €55 million annually in research into a digital technology development project in rural areas with three pillars: Land.digital, Rural areas in the age of digitalisations, and Smart Regions (Smarte.Land.Regionen).⁵⁵ One of the pillars, Smarte.Land.Regionen, was launched by the German Ministry of Food and Agriculture, covering seven counties in rural areas with the goal of exploring the benefits that digital technologies can offer to countryside inhabitants.⁵⁶ The ENRD also contributes to the development of smart village models in German with their thematic group, focusing on "smart and competitive countryside" – with the task of researching revitalising rural services using digital tools.⁵⁷

The majority of the digital projects implemented in German rural areas concentrate on introducing digital tools and fast internet to improve rural

52. Siedentop, S. J. 2008. Die rückkehr der städte. In *Informationen zur Raumentwicklung* 3 (4), pp. 193–210.

53. BMEL - Bundesministerium für Ernährung und Landwirtschaft. 2017. *Ländliche Regionen verstehen*. Available online at (https://www.bmel.de/SharedDocs/Downloads/DE/Broschueren/LaendlicheRegionen-verstehen.pdf?__blob=publicationFile&v=15).

54. BMEL. 2022. *Universal broadband coverage – also in rural areas*. Available online at (<https://www.bmel.de/EN/topics/rural-regions/digitalisation-rural-areas/broadband-strategy.html>). Updated on 4 April 2022. Checked on 4 April 2022.

55. ENRD. 2018b. *Digital Villages*. Available online at (https://enrd.ec.europa.eu/publications/smart-villages-digital-villages_en). Updated on 30 March 2019. Checked on 4 April 2022.

56. BMEL. 2021. *Modellvorhaben "Smarte.Land.Regionen"*. Available online at (<https://www.bmel.de/DE/themen/laendliche-regionen/digitales/smart-landregionen/mud-smarte-landregionen.html>). Updated on 7 December 2021. Checked on 4 April 2022.

57. ENRD. 2019. *Projects & Practice*. Available online at (https://enrd.ec.europa.eu/projects-practice/_en?f%5B0%5D=sm_enrd_eu_countries%3AGermany). Updated on 4 April 2022. Checked on 4 April 2022.

citizens' lives, mainly in the field of childcare-givers and medical aid.⁵⁸ For instance, the *Kiebitz-Klasse* model was introduced in Langeooge to help primary school students connect with other students from various schools in different locations beyond their island.⁵⁹

One of the most prominent rural digitisation projects in Germany is the Digital Villages project launched by the Ministry of Internal Affairs and Sports Rhineland-Palatinate and the Fraunhofer Institute for Experimental Software Engineering (IESE) in the summer of 2015 with a total funding of up to €4.5 million.⁶⁰ The project covers a variety of topics (digital local commerce, volunteering, and communication) and geographic areas, as it includes 33 municipalities.⁶¹ In the early stages of the project, researchers focused on conceptualising, analysing the current situation, and drawing on practical solutions after discussions with local residents and stakeholders.⁶² Based on these extensive contributions of ideas and feedbacks, the team carried on designing and developing the project's core digital software: the mobile application *LieferBar* and the website *BestellBar*. These digital platforms perform as digital supermarkets, helping parties exchange their local goods, services, and voluntary works. In particular, on *BestellBar*, local distributors deliver their diverse goods, from farm products to pharmacies, laundry services, etc. Volunteers then support with deliveries, using the *LieferBar* app. For each delivery, volunteers will earn *DigiTaler*, a currency that they can use to buy other goods and services on *BestellBar*'s system. In addition, the project also connects postal terminals to make delivery more convenient. In other words, the *Digital Village* project builds an ecosystem for rural residents, based on digital platforms, where the exchange of goods and services becomes more convenient.

58. Meyn. 2020.

59. Ebel, Christian Ebel. 2016. Eine Verbindung in die Welt. Christiane Schicke. Available online at (<https://schule21.blog/2016/02/11/eine-verbundung-in-die-welt-christiane-schicke/>). Updated on 18 March 2021. Checked on 4 April 2022.

60. ENRD. 2018c. German strategies for digitising rural areas. Available online at (https://enrd.ec.europa.eu/sites/default/files/enrd_publications/digital-strategies_case-study_de.pdf). Checked on 5 April 22.

61. Ibid.

62. Ibid.

The *Digital Village* project also supports the communication sector. In particular, *DorftNews*, a local portal, was established to bring news and events to local residents with a few clicks.⁶³ *Digital Village* also introduced *DorfFunk* – an application that not only provides news in all available areas to the rural inhabitants, but also allows them to offer their goods and services to the community.

4.3. Supporting Rural Villages in Malaysia

Over the years, Malaysia has had several initiatives that fall under the smart villages agenda. This section reviews the Satu Daerah Satu Industri (One District One Product, SDSI) initiative, and the Smart Villages project with a focus on digital access.

The concept of “one village, one product” originated in Japan in 1979, and has been widely adopted in all ASEAN countries since the 1990s except in Singapore.⁶⁴ Malaysia introduced the SDSI in 1992 and fully adopted it as a government programme by 2003.⁶⁵ The SDSI’s three main objectives are: to increase the quality of life of entrepreneurs, primarily in the rural areas; to use the natural resources and labour force in rural areas more efficiently; and to increase the competitiveness of rural entrepreneurs by producing products and services for the international market.⁶⁶

Under the programme, the government provides assistance to rural entrepreneurs, including skills development, product development, marketing and promotion, financial assistance (loans) monitoring and evaluation,

63. Fraunhofer IESE. 2019. Digitale Dörfer - Hinter den Kulissen. Available online at (<https://www.digitale-doerfer.de/das-projekt/>). Updated on 5 April 22. Checked on 5 April 22.

64. MCS - Ministry of Cooperatives and SMEs Indonesia. 2011. Improvement rural living condition through one village one product movement. Final report. ASEAN Cooperation Project No. IDN/SME/11/003 Reg. (<https://asean.org/wp-content/uploads/2012/05/3.-OVOP-Guidelines.pdf>).

65. Ibid.

66. Kader, R.A., Mohamad, M.R., and Ibrahim, A.A.H.C. 2009. Success Factors for Small Rural Entrepreneurs under the One-District-One-Industry Programme in Malaysia. *Contemporary Management Research* Pages 147-162, Vol. 5, No. 2, June 2009. (doi:10.7903/cmr.1173).

quality control and resource management.⁶⁷ The SDSI programme involves several government institutions, including the Ministry of Agriculture and Agro Based Industry, Ministry of Rural and Regional Development, Ministry of Tourism and Culture, the Malaysian Handicraft Development Corporation and Ministry of International Trade and Industry.⁶⁸

As of 2011, the SDSI has created 6,247 entrepreneurs in 141 districts across Malaysia and generated 12,428 employment opportunities in four main sectors – food and beverage, homestay, crafts and health services and products.⁶⁹ In 2013 alone, the government generated RM16.2 million (\$5.2 million)⁷⁰ in cash and contract sales following the facilitation of local entrepreneurs' participation in national fairs.⁷¹ Between January and October 2020, Malaysia's Homestay Experience Programme, which aims to encourage rural communities to offer community-based tourism by sharing the former's lifestyles, festivals, customs, cultures and products with tourists, attracted 120,000 local and international tourists and generated RM8 million (\$2 million) in income for villages.⁷²

A number of studies highlighted some key success factors of the SDSI programme and its specific programmes. Government assistance in terms of business skills training and extension services and improving the enabling environment in rural areas (e.g., infrastructure, communications, power supply) are key determinants for the success of SDSI entrepreneurs.⁷³ For the clay vase entrepreneurs in Kuala Kangsar district, there are two important areas of progress. First, local entrepreneurs' adoption of technologies and innovations for maintaining quality products and services; and second, establishment of a contract system or joint venture between major local en-

67. Kader et al. 2009; MCS. 2011.

68. MCS. 2011.

69. Ibid.

70. Authors' estimate based on 2012 exchange rates from World Bank database. (<https://data.worldbank.org/indicator/PA.NUS.FCRF>).

71. MCS. 2011.

72. Abrar, A. 2020. Malaysia homestay experience program. Presentation during the 14th UNWTO Asia/Pacific executive training programme on tourism policy and strategy, 15-17 December. UN World Tourism Organisation. (<https://www.unwto.org/events/the-14th-unwto-asia-pacific-executive-training-programme-on-tourism-policy-and-strategy>).

73. Kader et al. 2009.

preneurs and smaller, stay-at-home craftsmen.⁷⁴ For Malaysia's homestay programme, an important role is played by partnerships among industry players, non-governmental organisations (NGOs) and local and international travel agents; continuous promotions; and establishing cooperatives and unique selling points.⁷⁵

Beyond entrepreneurship training and promotion, the Malaysian government conducts evaluations to improve the SDSI brand, and is developing intellectual property rights for products produced under the programme as a way to ensure compliance to domestic and international quality market standards.⁷⁶

In June 2019, Malaysia launched its Smart Villages project in rural areas as part of the government's Rural Development of Hope 2018-2023.⁷⁷ The project is expected to narrow the digital divide between rural and urban areas; enable villagers to sell their products on online platforms; power smart classrooms and digital libraries in villages; facilitate health care delivery via telemedicine; minimise migration from rural to urban regions; and encourage innovation and entrepreneurship.⁷⁸

In August 2019, the government signed a memorandum of understanding with six corporations to implement the Smart Villages project, which is expected to provide high-speed internet access, reskilling and upskilling training, entrepreneurship development programme, interactive engagements, e-marketplace application usage and digital marketing.⁷⁹ The pilot

74. Kamarudin, K.A. and Abd Wahid, S.N.A. 2017. One District One Industry Movement for Inclusive Rural Development and Beyond: the Case of Labu Sayong Entrepreneurs in Malaysia. Conference paper. The 8th International Conference and Field Study, 16-17 May. (https://www.researchgate.net/publication/314209683_One_District_One_Industry_Movement_for_Inclusive_Rural_Development_and_Beyond_the_Case_of_Labu_Sayong_Entrepreneurs_in_Malaysia).

75. Abrar. 2020.

76. MCS. 2011.

77. Aziz, A. 2019. Rural Development Ministry signs MoU with 6 companies in Smart Village initiative. (<https://themalaysianreserve.com/2019/08/21/rural-development-ministry-signs-mou-with-6-companies-in-smart-village-initiative/>).

78. Aziz. 2019; TM One. 2020. Inside Malaysia's Smart Village Project. (<https://www.tmone.com.my/resources/think-tank/article/inside-malaysias-smart-village-project/>).

79. Aziz. 2019.

programme is aimed at 191 villages, with expansion plans for up to 15,000 villages across Malaysia.⁸⁰

4.4. Climate-Smart Villages: The Philippines

The Philippines is highly vulnerable to climate-related risks and extreme weather conditions, which motivated the government to mainstream climate adaptation in the Department of Agriculture's (DA) plans and programmes.⁸¹ Since 2013, the DA, in cooperation with DA regional field offices (DA-RFOs) and local government units (LGUs), has implemented the Adaptation and Mitigation Initiative in Agriculture (AMIA) programme to enable and capacitate local communities to manage climate risks while pursuing sustainable livelihoods.⁸² This is being implemented through the introduction of and support in the use of climate-resilient agriculture (CRA) technologies (e.g., climate risks-tolerant crops) and practices (e.g., soil and water conservation practices).⁸³ There are 77 AMIA villages at various stages of development as of 2021.⁸⁴

Lessons learned from the AMIA programme implementation include:⁸⁵

- *Incorporating local context in implementation.* When introducing CRA technologies and practices, it is important to consider traditional farmer knowledge, markets, financing and institutions. Developing the capacity of DA-RFOs and LGUs in understanding and disseminating CRA research output to farming communities is critical.

80. TM One. 2020.

81. Vidallo et al. 2019.

82. Ibid.

83. Ibid.

84. Barbon, W.J., Punzalan, B., Wassman, R., Bui, V.L., Vidallo, R., Villanueva, J., Talsma, T., Bayot, R., and Gonsalves, J. 2021. Scaling of Climate-Smart Agriculture via Climate-Smart Villages in Southeast Asia: Insights and Lessons from Vietnam, Laos, Philippines, Cambodia and Myanmar. CCAFS Working Paper no. 376. Wageningen, the Netherlands: CGIAR Research Program on Climate Change, Agriculture and Food Security.

85. Vidallo et al. 2019.

- *Understanding climate vulnerability and resiliency at different levels.* The programme has developed climate risk vulnerability and CRA assessment at the national and regional levels, but also conducted impact assessment at the community level through a participatory approach. To increase overall community resiliency, the programme also implements both commodity and livelihood diversification strategies in villages, which both help in increasing agricultural productivity and human nutrition.
- *Increasing the capacity of farmers to implement CRA technologies and practices.* In Quezon province, a village learning group of 10-12 farmers participate in field testing of CRA technologies and practices and meet once a month for sharing of experiences. Such a farmer-to-farmer learning process supplements the extension services in accelerating the adoption of technology in the community.
- *Creating an enabling environment to facilitate community adaptation of CRA technologies.* AMIA villages receive strong support from the LGUs, for example, by establishing community seed banks, extending crop insurance, developing climate-resilient infrastructure, introducing irrigation and water saving facilities, and facilitating access to credit.
- *Mainstreaming gender.* The programme needs to incorporate an in-depth analysis on specific constraints, cultural and social stereotypes, and restrictions on women's access to resources and services at the community level.
- *Identifying champions.* Experiences during the programme implementation highlight the role of local and regional champions in ensuring the sustainability of the AMIA villages. For example, town executives in Quezon incorporate the AMIA programme's climate-resilient agricultural approaches in their municipal programmes, while the RFOs provide additional investments to the AMIA programme and link other existing DA programmes in the AMIA implementation.

While still largely at the pilot stages, the DA is currently working to transform the AMIA villages into Climate Resilient Agri-Fisheries Technology-based Enterprises (AMIA-CREATE), with the aim of consolidating climate resilience production into farmer-led enterprises at the municipal, provincial and regional levels.⁸⁶

Table 2 summarises the key lessons from each case study, highlighting success factors as well as encountered challenges during the implementation of support in specific countries.

86. Barbon et al. 2021.

Table 2. Summary of objectives and lessons learned from EU and ASEAN smart village case studies.

| | Italy | Germany | Malaysia | Philippines |
|-----------------------------|--|---|--|--|
| Smart village programme | Italian National Strategy for Inner Areas 2014-2020 | Digital villages 2015-2019 | Satu Daerah Satu Industri (One District One Product) since 2003 | Climate smart villages since 2013 |
| Objective | To contribute to economic and social recovery, creating jobs, fostering social inclusion and reversing the demographic decline and the ageing of the population of inner areas. | To identify digital solutions for people living in sparsely populated areas, to help address the challenges of demographic change and rural depopulation. | To increase the quality of life of entrepreneurs in rural areas; to efficiently use the natural resources and labour force in rural areas; to increase the competitiveness of rural entrepreneurs by producing products and services for the international market. | To enable and capacitate local communities to manage climate risks while pursuing sustainable livelihoods. |
| Coverage | 1,066 municipalities | 33 municipalities | 6,247 entrepreneurs in 141 districts | 77 villages |
| Key interventions | Parallel improvements in services and investments in local development initiatives; national and multi-level governance; multi-fund and participatory approach to local development. Inner areas designed and implemented their own specific interventions. | Creation of a common digital platform to create new solutions for the supply of local goods and services (e.g., for bakeries, farmers, laundries, bookstores), communication (e.g., local news) and voluntary work. | Assistance on district skills and product development, marketing and promotion, financial assistance (loans) monitoring and evaluation, quality control and resource management. | Introduction of and support in the use of climate-resilient agriculture (CRA) technologies (e.g., climate risks-tolerant crops) and practices (e.g., soil and water conservation practices). |
| Impact/ key lessons learned | <ul style="list-style-type: none"> • Impact: Population declined slowed down from -4.2 per cent in 2001-2011 to -2.3 per cent in 2011-2016. • Key lessons: there can be positive synergies when local experts directly participate in the design and implementation of inner areas strategy; there is less collaboration among managing authorities of different EU funds. | <p>Essential during project implementation: to build up innovation infrastructure, create inter-disciplinary implementation teams, clear implementation plan, working on early prototypes, local participation.</p> | <ul style="list-style-type: none"> • Impact: as of 2011 generated 12,428 employment opportunities; \$5.2 million in sales by local entrepreneurs in national fairs in 2013; attracted 120,000 tourists and generated \$2 million in income for villages in 2020. • Key success factors: government assistance, improving infrastructure in rural areas, partnerships among industry players. | <p>Lessons learned so far: incorporating local context in implementation; understanding climate vulnerability and resiliency at different levels; increasing the capacity of farmers to implement CRA technologies and practices; mainstreaming gender; identifying champions.</p> |

5. CONCLUSIONS

The comparative analysis at the regional and country level shows the differences in motivations and interventions (including policy frameworks, development target/objectives and funding mechanisms) on supporting smart villages in ASEAN and the EU. The analysis shows that approaches to improving villages in ASEAN are focused on improving rural employment and incomes, while addressing depopulation in rural areas is a key motivation to support smart villages for the EU.

While different in their approaches, there are lessons which can be learned from both regions. For example, in ASEAN, there is evidence that Malaysia's "one town, one product" and "rural/eco-tourism" have generated jobs and better income for rural communities. In some cases, town products and services have expanded into international markets. While the incorporation of "smart" solutions in rural villages in most ASEAN countries are mostly in the pilot stages (e.g., internet connectivity in Malaysia; climate-smart villages in the Philippines, microgrid power in Indonesia, solar panels in Cambodia), there are lessons that can be learned on tailoring measures according to the existing knowledge of both the recipients and implementers. These lessons from project-level implementation in ASEAN may be useful as the EU designs its tools and strategies for supporting smart villages in similar contexts.

Meanwhile, ASEAN can learn from the EU's efforts in institutionalising a common framework and earmarking regional funds to support smart villages in member states. The EU may also offer support to ASEAN on their strategy of building and expanding access to technology and finance in rural villages in a sustainable way.

This said, ASEAN has explicit objectives of rural development and poverty eradication that could benefit from a smart villages approach; and the EU's concept could provide guidance as to how ASEAN can develop smart villages applicable within the ASEAN processes. To develop an ASEAN approach to smart villages, the following need to be discussed:

1. What would be the objective of smart villages in ASEAN? It is necessary to have one common framework, but the answer does not need to be narrow. In the EU, the objective is combating the depopulation in rural areas, but in ASEAN it could be improving services delivery and eradicating rural poverty, in line with its strategies.
2. What would be the best way to achieve these objectives through smart villages? What would be the pathways? The EU has established that, as each locality is unique, solutions should also be uniquely tailored. Like the EU, the ASEAN countries display a great variety, and therefore it does not make sense to impose strict guidelines on how to implement smart villages. A similarly flexible approach could be adopted by ASEAN.
3. What would be the “institutional home” of smart villages within ASEAN? Would it be one of the ministerial organs, or a dedicated centre? How would it be administered day to day?
4. And finally, and connected to the previous question, how would the smart villages agenda be financed? The EU has earmarked funds for this agenda under its rural development funding. How would the ASEAN funding model for this agenda work? Would it remain decentralised or, like the EU, come from a centralised budget? This question is complicated, but central to the success of the smart villages agenda in ASEAN.

In summary, this chapter has shown the differences between the EU and ASEAN in their approaches to smart villages, and it has proposed some ideas to develop the smart villages framework in the ASEAN region. A collaborative effort between the two blocs could help develop supporting mechanisms for smart villages in ASEAN.

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11

Gender Perspectives on Food Security

**Likhedy Touch | Melissa Hiltl |
Win Nandar Thet**

Abstract

Many efforts in water supply, energy as well as food security development in Southeast Asia are connected and have regional dimensions since they rely on transboundary river basins like the Lower Mekong River Basin (LMRB). Especially when it comes to food security and proper nutrition, the Mekong River is a central source of living. Mekong riparian states faced nearly 15 million malnutrition cases from 2019 to 2021. Approximately, 60 per cent of the undernourished are female. Since regional food security issues are closely related to water management and regional security issues in its member countries, this paper analyses food security in relation to the Mekong River Commission as a central interregional organisation for sustainable development within the LMRB.

INTRODUCTION

With its growing population, rising economy and rapid urbanisation, South-east Asia (SEA) is one of the most dynamic and fastest-growing regions in the world. With 1.75 billion people, the region is home to 20 per cent of the global population. Its population is growing by 1.5 per cent annually while its economy has expanded rapidly in recent decades. Despite its growth over recent decades, SEA has still “some of the worst levels of human deprivation in the world”¹. More than 200 million people (12 per cent of the total population) still lack access to safe drinking water and more than 900 million (52 per cent of the population) do not have access to good and safe sanitary service (data from Rasul et al. 2021, 466-467). In addition, severe food insecurity affects 22.1 million people (3.3 per cent) in SEA and about 125.5 million people (18.8 per cent) are moderately or severely concerned by food insecurity.²

Many efforts in water supply, energy as well as food security development in Southeast Asia are connected and have regional dimensions since they rely on transboundary river basins like the Lower Mekong River Basin (LMRB). Starting from the mountains of Tibet, the Mekong River is the 12th longest river in the world, flowing to the South China Sea via six countries, namely China, Myanmar, Laos, Thailand, Cambodia, and Vietnam. The Mekong’s total length is about 4,200 km and it provides a source of living for about 70-80 million people within the riparian countries.³ Especially when it comes to food security and proper nutrition, the Mekong River is a central source of living. Economic activities linked to food security within the Me-

1. Data from Rasul, Golam, Nilhari Neupane, Abid Hussain, and Binaya Pasakhala. 2021. Beyond Hydropower: Towards an Integrated Solution for Water, Energy and Food Security in South Asia. *International Journal of Water Resources Development* 37 no. 3, p. 466. (<https://doi.org/10.1080/07900627.2019.1579705>).

2. FAO et al. 2021. *The State of Food Security and Nutrition in the World 2021: Transforming Food Systems for Food Security, Improved Nutrition and Affordable Healthy Diets for All*, The state of food security and nutrition in the world (SOFI) 2021. Rome, pp. 11-18. (<https://doi.org/10.4060/cb4474en>).

3. Haefner, Andrea. 2016. *Negotiating for Water Resources: Bridging Transboundary River Basins*. Earthscan studies in water resource management. Milton: Taylor and Francis, pp. 36-38. Accessed June 10, 2021. (<http://gbv.eblib.com/patron/FullRecord.aspx?p=4710150>).

kong Delta are composed of rice cultivation and its sophisticated rice crop ecosystem, as well as aquaculture and fishery.⁴

Within this paper, *transboundary basins* means river basins that include more than two bordering states, based on the definition of *transboundary waters* in Article 1 of the United Nations (UN) Water Convention: “any surface or ground waters which mark, cross or are located on boundaries between two or more States”.⁵ These bordering states will concurrently be called *riparian states* since they are states “bordering the same transboundary waters”,⁶ such as in the context of the Lower Mekong River Basin. The usable amount of water within transboundary river basins like the LMB has to serve various human functions such as food production, energy generation, transportation, drinking water or socio-environmental preservation. It can be said that the needed supply of water for riparian countries feeds into their overall foreign relations with other countries.⁷

This paper is structured as follows: First, we will lay out our approach and aim within this paper, including research timeframe and objects of analysis. We will elaborate on our research questions about gender approaches for food security, and then define the gender concepts that we will be studying into. The Mekong River Commission developed its own gender mainstreaming approach, which we will be presenting to serve as a basic scope of understanding regarding the gender perspective within the Mekong riparian states. Next, the paper will provide explicit data about the state of food security and nutrition within the Lower Mekong River states, specifically Myanmar, Laos, Thailand, Cambodia, and Vietnam. We name five potential drivers, namely biophysical and environmental; innovation, technology, and infrastructure;

4. Cosslett, Tuyet L., and Patrick D. Cosslett. 2014. Water Resources and Food Security in the Vietnam Mekong Delta. *Natural Resource Management and Policy* 44. Cham, s.l.: Springer International Publishing, pp. 11-12. (<https://doi.org/10.1007/978-3-319-02198-0>).

5. United Nations. 2014. Convention on the Protection and Use of Transboundary Watercourses and International Lakes: As Amended, Along with Decision VI/3 Clarifying the Accession Procedure. Geneva: United Nations, pp. 5-6.

6. United Nations. 2014. Convention on the Protection and Use of Transboundary Watercourses and International Lakes: As Amended, Along with Decision VI/3 Clarifying the Accession Procedure. Geneva: United Nations, pp. 5-6.

7. Biba, Sebastian. 2018. China's Hydro-Politics in the Mekong. Routledge contemporary China series 186. New York: Routledge, pp. 69-70. (<https://doi.org/10.4324/9781315148663>).

political and economic; socio-cultural; and demographic drivers,⁸ which will be further elaborated in terms of their significance for food security. Two of those drivers will then be examined more closely and put into context with income and gender considerations. We state that (1) income is a significant dimension of demography regarding food security and (2) gender is closely linked to food security, being a socio-cultural driver. Lastly, the paper bridges food security and gender to go into a discussion about policy recommendations for the Mekong River Commission. We close with a conclusion.

Research Questions

- Is food security in the Mekong Delta addressed by the Mekong River Commission?
- How does the Mekong River Commission address gender mainstreaming, especially in food security?
- Thesis: The Mekong River Commission should address food security as much as it addresses gender mainstreaming, because food security and gender are linked closely due to women's role in food security.

METHODOLOGY

This paper conducts a policy analysis using a method comprising both literature review and quantitative data. Most of the data for the literature review is extracted from secondary sources such as policy papers, academic research, journal articles, etc., combined with quantitative data extracted from the Food and Agriculture Organisation of the United Nations' FAOSTAT website.⁹ Additionally, this paper will heavily consult documents and reports

8. HLPE. 2017. Nutrition and Food Systems: A Report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, p. 24. Accessed 6 October 2022. (<https://www.fao.org/3/i7846e/l7846E.pdf>).

9. FAO. 2022. FAOSTAT: Selected Indicators, Countries. FAO. Accessed 19 July 2022. (<https://www.fao.org/faostat/en/#country>).

from the Mekong River Commission (MRC), the Food and Agriculture Organisation of the United Nations (FAO), the United Nations (UN) in general as well as the World Health Organisation (WHO).

Based on the analysis provided throughout this paper, we aim to produce policy recommendations based on the gaps we have identified regarding food security in the Mekong Delta and to examine the practicality of the implementation of the recommended policies. The timeframe of analysis is between 2019 and 2021, because we see the necessity to include the impacts on food security caused by the COVID-19 pandemic in the Mekong Subregion. Based on the existing food security policies, this paper will specifically target the policies that have been put out by the Mekong River Commission¹⁰ as it is an intergovernmental organisation that has worked in the Mekong region for around 25 years, serving as a regional platform and knowledge hub for regional dialogue and cooperation in the Lower Mekong River Basin.¹¹ Hence, this paper intends to look at food security policies through a gender perspective lens by taking gender-based differences into account at the MRC level.

It seems obvious that the MRC is focusing on water management and security in the region, rather than on food-related sectors. In this light, we would like to address this as a gap which the MRC should integrate into its work. Regional food security issues are closely related to water management and regional security issues within the member countries. Thus, is food security in the Mekong Delta well addressed by the Mekong River Commission?

Therefore, the paper will analyse food security issues through a gender perspective by using and applying gender mainstreaming and the gender-sensitive approach as a tool to achieve gender equality in this field. Accordingly, our central research question is: How does the Mekong River Commission address food security from a gender perspective?

10. Mekong River Commission. 2013. Commitment on Gender Mainstreaming: Water Resources Development in the Lower Mekong Basin. Cambodia, Lao PDR, Thailand, Viet Nam for Sustainable Development Mekong River Commission. Accessed 5 September 2021. (<https://www.mrcmekong.org/assets/Publications/policies/MRC-Gender-SP-05-Jan-2013-Eng.pdf>).

11. Mekong River Commission 2013. Commitment on Gender Mainstreaming.

GENDER CONCEPTS AND DEFINITIONS

It can be said that women are generally more vulnerable in terms of food security than men as they are often responsible for growing and preparing food, for which they rely heavily on the availability of food in the market.¹² Hence, indigenous communities and marginalised groups like women and girls in particular suffer from food insecurity and malnutrition. Women and infants, children and adolescents are at particular risk of malnutrition due to their higher needs in terms of consumption. According to the Asian Development Bank (ADB) report on gender equality and food security, “women and girls are overrepresented among those who are food-insecure. Worldwide, an estimated 60% of undernourished people are women or girls.”¹³

When it comes to gender discussions in a particular field, there are many big key terms to be defined to understand the underlying issues in a deeper context. Therefore, the following parts will provide some important definitions and aspects to shed light on the intention of the discussion. A gender perspective is required to ensure that the specific needs of men and women and their vulnerabilities and capacities are properly recognised and addressed.¹⁴ Gender mainstreaming is being interpreted through different definitions based on the respective institutions. The Council of Europe has defined gender mainstreaming as an approach to incorporate the gender perspective in all policies at all levels and stages by reorganising, improving, developing, and evaluating the policy processes.¹⁵ The United Nations Economic and Social Council (ECOSOC) also defined the term in the same manner, yet further elaborated on the inclusion of women’s and men’s concerns and experiences as an essential factor of the design, implementation, moni-

12. Mekong River Commission. 2022. Topics: Gender. Accessed 5 October 2022. (<https://www.mrcmekong.org/our-work/topics/gender/>).

13. Schutter, Olivier de. 2013. *Gender Equality and Food Security: Women's Empowerment as a Tool Against Hunger*. Mandaluyong City Metro Manila Philippines: Asian Development Bank, p. xiii.

14. Mekong River Commission. 2013. *Commitment on Gender Mainstreaming*.

15. Council of Europe. 2022. *What Is Gender Mainstreaming? Themes: Gender mainstreaming at the Council of Europe*. Accessed 3 October 2022. (<https://www.coe.int/en/web/genderequality/what-is-gender-mainstreaming>).

toring and evaluation of policies and programmes in all societal spheres.¹⁶ In contrast, gender-sensitivity refers to an approach to increase the awareness of gender, including the important effects of gender norms, roles and relations in a society.¹⁷ There can be a lot of different forms of approach incorporated to sensitise the gender topic.

The Mekong River Commission Gender Cluster

A broader and sustainable approach to food security within the Mekong Delta thus must include gender-sensitive approaches. Since 2000, the governments of the Mekong riparian countries have committed through the Mekong River Commission (MRC) Council to develop and endorse the MRC Gender Strategy and Policy.¹⁸ We propose that the Mekong River Commission should address food security as much as it addresses gender-sensitivity, because food security and gender are linked closely due to women's role in food security and its effects, and vice versa.

The MRC is the key transboundary governance institution within the Mekong River region. Four countries, namely Laos, Thailand, Cambodia and Vietnam, are members of the MRC while Myanmar and China are dialogue partners, following the recommendations for sustainable development in the Basin Development Strategy.¹⁹ Since its organs are operating on a transregional level without having supranational competence, the MRC is a unique project with both ambitious as well as ambiguous governance roles.²⁰

16. Division for the Advancement of Women. 1997. Gender Mainstreaming: Extract from Report of the Economic and Social Council for 1997 (A/52/3) New York, 18 September 1997. Accessed 6 October 2022. (<https://www.un.org/womenwatch/daw/csw/GMS.PDF>).

17. UNESCO. Gender-Sensitive. Policytree consult UNESCO-IIEP. Accessed 6 October 2022. (<https://policytoolbox.iiep.unesco.org/glossary/gender-sensitive/>).

18. Climate Change and Adaptation Initiative. 2013. Gender Responsiveness Plan: Working Paper, p. 2. Mekong River Commission. Accessed 3 October 2022. (<https://www.mrcmekong.org/assets/Publications/MRC-GRP.pdf>).

19. The Mekong Committee became institutionalised upon the drawing up of the 1995 Mekong Agreement.

20. Boer, Ben. 2016. *The Mekong: A Socio-Legal Approach to River Basin Development*, Earthscan studies in water resource management. New York: Routledge, pp. 87-89. (<https://doi.org/10.4324/9781315765556>, <https://www.taylorfrancis.com/books/9781315765556>).

The Mekong River Commission's vision is to promote prosperity in the Mekong River Basin while sustaining efforts to ensure the sustainable development and management of the Mekong's water resources²¹. Thus, its mission is to promote and coordinate sustainable management and development of the water and related resources for the mutual benefits of the lower Mekong countries and the people's wellbeing.²²

In the meantime, it is worth mentioning the work of the MRC on gender policy, as in 2000, the MRC Council adopted the Gender Policy and Strategy, recognising gender equality as a national priority contributing towards both social and economic development of the region. At the institutional level, the MRC is committed to mainstreaming gender into development plans and policies by including gender aspects in Basin Development Strategies and Plans, strengthening technical capacity and accountability systems for gender mainstreaming in technical work, promoting a gender-sensitive organisational culture and working environment while generating the commitment of the leadership, promoting stakeholder participation and gender mainstreaming through dialogues and training sessions as well as developing gender-related guidelines, toolkits and capacity-building tools.²³

STATE OF FOOD SECURITY AND NUTRITION IN MEKONG SUBREGION IN DATA

Food is a human right and essential for everyone. The World Summit on Food Security in 2009 declared: "Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nu-

21. Mekong River Commission. 1995. Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin. Mekong River Commission.

22. Mekong River Commission. 1995. Agreement on the Cooperation for the Sustainable Development of the Mekong River Basin.

23. Mekong River Commission. 2022. Topics: Gender.

trititious food to meet their dietary needs and food preferences for an active and healthy lifestyle”.²⁴

When people are subjected to conditions of insufficient energy or nutrients or both for both long and short periods of time, the situation is said to be one of weak food security. Generally, the state of food security can be distinguished into four dimensions:

- (a) Availability – sufficient supply of food in terms of quantity and quality;
- (b) Accessibility – enough land, inputs and money to achieve the required food for good health;
- (c) Utilisation – preparation, consumption and disposal of food with the support of clean water, dietary knowledge and safe sanitation;
- (d) Stability – stable and sustainable food supply access and availability during acute shocks and chronic or cyclical events.²⁵

Additional dimensions of *Sustainability and Agency* can be added when considering food security and nutrition according to the High Level Panel Experts (HLPE) report from 2017²⁶ and 2020²⁷.

As an impact of food insecurity, malnutrition problems are found within the Lower Mekong Region. Women and infants, children and adolescents are at particular risk of malnutrition. “Malnutrition refers to deficiencies, excesses, or imbalances in a person’s intake of energy and/or nutrients”.²⁸ Be-

24. Fullbrook, David. 2013. Food Security in the Wider Mekong Region, in: The Water-Food-Energy Nexus in the Mekong Region. ed. Alexander Smajgl and John Ward. New York: Springer New York, p. 62.

25. Fullbrook. 2013. Food Security in the Wider Mekong Region, p. 62.

26. HLPE. 2017. Nutrition and food systems.

27. HLPE. 2020. Impacts of COVID-19 on Food Security and Nutrition: Developing Effective Policy Responses to Address the Hunger and Malnutrition Pandemic. HLPE issues paper European Commission. Accessed 22 March 2022. (https://knowledge4policy.ec.europa.eu/publication/impacts-covid-19-food-security-nutrition-developing-effective-policy-responses-0_en).

28. WHO. 2022. Malnutrition: Key Facts. Accessed 3 May 2022. (<https://www.who.int/news-room/fact-sheets/detail/malnutrition>).

ing overweight in children and young adults is the result of lack of access and/or availability of healthy and nutritious food in terms of food insecurity. Hence, the term *malnutrition* addresses three broad groups of conditions:

- (a) Undernutrition, which includes wasting (low weight-for-height), stunting (low height-for-age) and underweight (low weight-for-age);
- (b) Micronutrient-related malnutrition, which includes micronutrient deficiencies (a lack of important vitamins and minerals) or micronutrient excess; and
- (c) Overweight, which includes obesity and diet-related non-communicable diseases (such as heart disease, stroke, diabetes, and some cancers).²⁹

RESULTS AND DISCUSSION

As shown in Tables 1 and 2, severe food insecurity affects 22.1 million people (3.3 per cent of the total population) in Southeast Asia and about 125.5 million people (18.8 per cent of the total population) are moderately or severely concerned by food insecurity.³⁰

29. WHO. 2022. Malnutrition.

30. FAO et al. 2021. The State of Food Security and Nutrition in the World 2021, pp. 11-18.

Table 1. Prevalence of food insecurity at severe level only, and at moderate or severe level, based on the food insecurity scale, 2014-2020.³¹

| | Prevalence of severe food insecurity (%) | | | | | | | | | | Prevalence of moderate or severe food insecurity (%) | | | | |
|--------------------|--|------|------|------|------|------|------|------|------|------|--|------|------|------|--|
| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | |
| WORLD | 8.3 | 8.1 | 8.3 | 8.7 | 9.6 | 10.1 | 11.9 | 22.6 | 22.8 | 23.6 | 24.9 | 25.9 | 26.6 | 30.4 | |
| AFRICA | 17.7 | 18.3 | 19.8 | 20.5 | 20.6 | 21.9 | 25.9 | 47.3 | 48.0 | 50.9 | 52.5 | 52.7 | 54.2 | 59.6 | |
| Northern Africa | 10.2 | 9.0 | 10.4 | 10.6 | 9.3 | 8.8 | 9.5 | 29.7 | 26.4 | 30.0 | 33.1 | 31.1 | 28.9 | 30.2 | |
| Sub-Saharan Africa | 19.4 | 20.4 | 22.0 | 22.7 | 23.2 | 24.9 | 29.5 | 51.4 | 53.0 | 55.8 | 57.0 | 57.6 | 59.9 | 66.2 | |
| Eastern Africa | 23.7 | 24.1 | 25.8 | 25.3 | 25.0 | 26.0 | 28.7 | 57.7 | 58.1 | 62.2 | 62.1 | 61.6 | 63.4 | 65.3 | |
| Middle Africa | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | 35.8 | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | 70.0 | |
| Southern Africa | 18.9 | 18.9 | 19.0 | 19.0 | 19.1 | 19.2 | 22.7 | 43.8 | 43.9 | 44.0 | 44.1 | 44.2 | 44.3 | 49.7 | |
| Western Africa | 8.6 | 10.8 | 12.9 | 15.3 | 16.8 | 19.6 | 28.8 | 39.2 | 42.8 | 45.5 | 48.7 | 50.6 | 54.2 | 68.3 | |
| ASIA | 7.7 | 7.2 | 6.9 | 7.2 | 8.6 | 9.0 | 10.2 | 19.1 | 18.8 | 18.9 | 20.3 | 22.2 | 22.7 | 25.8 | |
| Central Asia | 1.6 | 1.4 | 2.0 | 2.8 | 2.2 | 2.3 | 4.7 | 8.5 | 9.1 | 10.0 | 13.9 | 13.6 | 13.2 | 18.0 | |
| Eastern Asia | 0.8 | 0.8 | 1.5 | 1.7 | 1.9 | 1.3 | 2.0 | 6.0 | 5.9 | 6.3 | 10.0 | 9.6 | 7.4 | 7.8 | |
| South-eastern Asia | 2.4 | 2.2 | 2.5 | 2.9 | 2.6 | 2.6 | 3.3 | 15.4 | 15.3 | 17.0 | 17.8 | 17.3 | 16.8 | 18.8 | |
| Southern Asia | 15.9 | 14.8 | 13.1 | 13.3 | 16.9 | 18.3 | 19.9 | 31.6 | 30.8 | 30.1 | 29.4 | 34.6 | 37.6 | 43.8 | |
| Western Asia | 8.2 | 8.5 | 8.6 | 9.6 | 9.2 | 8.8 | 8.9 | 27.5 | 27.4 | 26.3 | 28.2 | 27.5 | 27.9 | 28.3 | |

31. FAO et al. 2021. The State of Food Security and Nutrition in the World 2021, p. 17.

Table 2. Number of people experiencing food insecurity at severe level only, and at moderate or severe level, based on the food insecurity scale, 2014-2020.³²

| | Number of severely food insecure people (millions) | | | | | | Number of moderately or severely food insecure people (millions) | | | | | | | |
|--------------------|--|-------|-------|-------|-------|-------|--|---------|---------|---------|---------|---------|---------|---------|
| | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
| WORLD | 604.5 | 598.4 | 620.2 | 656.8 | 731.3 | 779.9 | 927.6 | 1 645.5 | 1 680.1 | 1 762.9 | 1 881.6 | 1 978.7 | 2 049.9 | 2 368.2 |
| AFRICA | 203.5 | 215.9 | 240.1 | 254.7 | 262.9 | 286.7 | 346.6 | 545.0 | 567.2 | 617.8 | 653.3 | 671.8 | 708.6 | 798.8 |
| Northern Africa | 22.4 | 20.2 | 23.7 | 24.6 | 22.0 | 21.2 | 23.4 | 65.1 | 59.1 | 68.6 | 77.0 | 73.7 | 69.8 | 74.5 |
| Sub-Saharan Africa | 181.0 | 195.7 | 216.5 | 230.1 | 241.0 | 265.5 | 323.2 | 479.8 | 508.1 | 549.2 | 576.3 | 598.1 | 638.8 | 724.4 |
| Eastern Africa | 89.9 | 94.0 | 103.2 | 104.2 | 105.6 | 113.0 | 127.9 | 218.7 | 226.3 | 248.9 | 255.4 | 260.5 | 275.0 | 290.9 |
| Middle Africa | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | 64.3 | n.a. | n.a. | n.a. | n.a. | n.a. | n.a. | 125.7 |
| Southern Africa | 11.7 | 11.9 | 12.1 | 12.3 | 12.6 | 12.8 | 15.3 | 27.2 | 27.7 | 28.1 | 28.6 | 29.0 | 29.5 | 33.5 |
| Western Africa | 29.6 | 38.0 | 46.8 | 56.9 | 63.9 | 76.7 | 115.7 | 134.0 | 150.5 | 164.4 | 180.7 | 192.8 | 212.0 | 274.3 |
| ASIA | 337.2 | 319.9 | 308.0 | 323.7 | 394.5 | 414.7 | 471.1 | 840.1 | 834.6 | 846.8 | 918.2 | 1 014.0 | 1 043.2 | 1 198.7 |
| Central Asia | 1.1 | 1.0 | 1.4 | 2.0 | 1.6 | 1.6 | 3.5 | 5.7 | 6.3 | 7.0 | 9.9 | 9.8 | 9.6 | 13.4 |
| Eastern Asia | 13.2 | 12.6 | 24.6 | 28.4 | 31.3 | 21.7 | 33.8 | 98.0 | 97.1 | 104.1 | 166.2 | 159.5 | 124.6 | 130.8 |
| South-eastern Asia | 15.2 | 13.6 | 16.1 | 18.5 | 17.1 | 16.9 | 22.1 | 96.3 | 96.8 | 109.1 | 115.5 | 113.6 | 111.0 | 125.5 |
| Southern Asia | 287.2 | 270.7 | 243.3 | 249.1 | 319.5 | 350.3 | 386.8 | 570.6 | 563.8 | 557.7 | 551.3 | 656.5 | 721.4 | 849.8 |
| Western Asia | 20.7 | 22.0 | 22.7 | 25.7 | 24.9 | 24.2 | 24.9 | 69.6 | 70.7 | 69.0 | 75.2 | 74.5 | 76.7 | 79.2 |

32. FAO et al. 2021. The State of Food Security and Nutrition in the World 2021, p. 18.

Table 3 is based on combined data from FAOSTAT³³ that provides information about the state of undernourishment within the five countries of the Lower Mekong Delta between 2016 and 2021. It provides an overview of the specific selected indicator “hunger and food insecurity” by extracting data from the FAOSTAT webpage showing the number of people being undernourished (millions) on a 3-year average.³⁴ In terms of our analysis, the period 2019 to 2021 is especially interesting. According to FAOSTAT’s collected data, nearly 15 million people faced undernutrition and food insecurity in the Mekong riparian states in the period 2019-2021. Looking deeper, the malnutrition data of Cambodia and Laos in the period 2019-2021 did not change compared with those in the period 2018-2020. However, in Myanmar and Thailand, the malnutrition level rose in the 2019-2021 period. As a positive sign, the malnutrition level fell in the period 2019-2021 in Vietnam compared with the level from the 2018-2020 period.

Table 3. Number of people undernourished in the Mekong region from 2016 to 2021.³⁵

| Number of people undernourished (in million) 2016-2021 (3-year average) | | | | | |
|---|----------|----------|---------|----------|---------|
| | Cambodia | Laos PDR | Myanmar | Thailand | Vietnam |
| 2016-2018 | 1.2 | 0.4 | 1.6 | 5.4 | 6.8 |
| 2017-2019 | 1.1 | 0.4 | 1.4 | 5.4 | 6.5 |
| 2018-2020 | 1 | 0.4 | NR | 5.5 | 6 |
| 2019-2021 | 1 | 0.4 | 1.7 | 6.2 | 5.6 |

According to the *Economist Impact Global Food Security Index*³⁶, Vietnam stands at 46th, followed by Thailand, standing at 64th, Myanmar at 72nd, Cambodia at 78th and Laos at 81st, among 113 countries. These data showed Mekong riparian states’ food security conditions and pointed out concerns regarding the food security conditions in the Mekong riparian states.

33. FAO. 2022. FAOSTAT. Data extracted from country subpages on 19 July 2022.

34. FAO. 2022. FAOSTAT.

35. FAO. 2022. FAOSTAT.

36. Economist Impact. 2022. Global Food Security Index 2022. Accessed 4 October 2022. (<https://impact.economist.com/sustainability/project/food-security-index#global-overview>).

Drivers of Food Insecurity

According to the *High Level Panel of Experts on Food Security and Nutrition*³⁷, there are five drivers that change the functionality of the food system: bio-physical and environmental; innovation, technology and infrastructure; political and economic; socio-cultural; and demographic drivers.³⁸ First, natural resources, ecosystem services and climate change are included under bio-physical and environmental drivers. Since the Mekong region is predominantly organised agriculturally, drivers like climate change have a direct effect on the food security of riparian states. Second, innovation, technology and infrastructure drivers generally play a key role for the Global South. As stated in the Asian Development Bank (ADB) report, conducted by Oliver de Schutter, a lack of technology and infrastructure is one of the major problems contributing to food loss in the countries of the Global South.³⁹ Political and economic drivers can be subdivided into leadership, globalisation and trade, food, agriculture and nutrition policies, food prices and price volatility, land tenure and conflicts and humanitarian crises. Third, political crises, food prices and trade relate to each other and affect the food availability and accessibility dimensions of food security. Fourth, cultures and rituals as well as social traditions, including women's empowerment, are part of socio-cultural drivers.⁴⁰

Since women and girls are primarily responsible for food production, preparation, processing, and distribution as well as food marketing activities, socio-cultural drivers play an important role in food security and the food system.⁴¹ Hence, the socio-cultural discrimination women face not only exposes them to material deprivation, it also makes it more difficult for them to fulfil their vital roles in food security. This is particularly true of improving women's access to education and strengthening their role in decision making within the household and within society.⁴² Finally, demographic drivers

37. HLPE. 2017. Nutrition and food systems.

38. HLPE. 2017. Nutrition and food systems, p. 24.

39. Schutter. 2013. Gender equality and food security, p. 47.

40. HLPE. 2017. Nutrition and food systems, p. 24.

41. Schutter. 2013. Gender equality and food security, p. x.

42. Schutter. 2013. Gender equality and food security, pp. 20–23.

such as population growth, income and changing age distribution, urbanisation and migration or forced displacement can cause malnutrition and food insecurity.⁴³

Meanwhile, the prevalence of overweight and obesity caused by low dietary quality in adults and children is rapidly rising. On the one hand, being overweight can be seen as an interrelation with the fast-growing living standard in Asia, often highest among the wealthiest households. On the other hand, in countries with broad access to inexpensive, highly processed convenience foods, overweight among children and young adults can be seen as a consequence of missing healthy nutrition.⁴⁴ Generally, healthy diets including fruits, vegetables and dairy products are often unaffordable, driven by high prices or are lacking in constant accessibility. Affordability is particularly critical for mothers and their children when ensuring food security and nutrition, especially in rural areas.⁴⁵

An Extraordinary Driver: The COVID-19 Pandemic

Food security has been and will always be an important topic to discuss locally and globally, especially right now with the effects of the COVID-19 pandemic and the geopolitical tensions in the region.⁴⁶ Besides gender-based discrimination affecting food security, since the Mekong riparian states are predominantly agricultural countries, extreme climate events and natural disasters caused by climate change are the major factors affecting food security in the region. In this sense, COVID-19 can be seen as a natural climate conflict.⁴⁷ Before the pandemic, nearly 18 million people in the Mekong region were undernourished and faced food insecurity. According to FAO et al. Asia and Pacific is the region with the largest share of the global population

43. HLPE. 2017. Nutrition and food systems, p. 81.

44. FAO et al. 2021. The State of Food Security and Nutrition in the World 2021, p. 20.

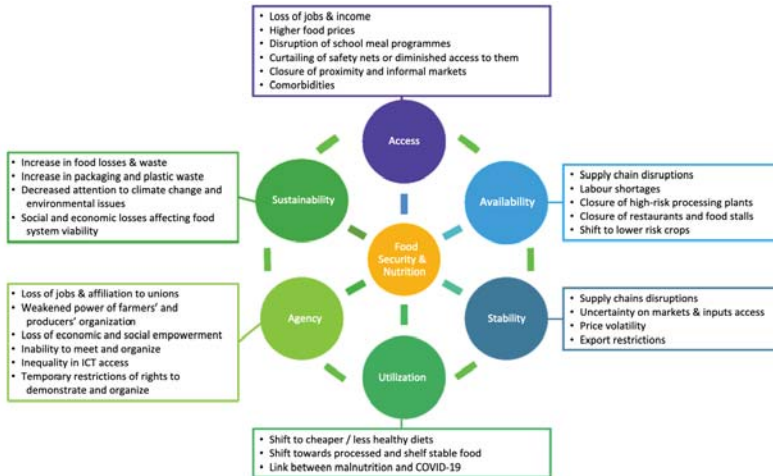
45. FAO et al. 2021. The State of Food Security and Nutrition in the World 2021, p. x.

46. FAO et al. 2021. The State of Food Security and Nutrition in the World 2021, p. 11.

47. FAO, IFAD, UNICEF, WFP and WHO. 2020. The State of Food Security and Nutrition in the World 2020: Transforming Food Systems for Affordable Healthy Diets. With the assistance of FAO: The state of food security and nutrition in the world 2020. Rome: FAO, p. xiv. Accessed October 6, 2022. (<https://www.fao.org/documents/card/en/c/ca9692en>).

that are undernourished, approximately 351 million people, which is “more than half of the global total (688 million)”.⁴⁸ According to FAO, in 2019, South-east Asia, which includes the Mekong River area, had the second highest number of undernourished people, numbering 64.7 million.⁴⁹

Figure 1. The impacts of COVID-19 on the six dimensions of food security.⁵⁰



Source: Authors.

The increased occurrence of these major drivers, now exacerbated by the COVID-19 pandemic, has led to a rise in hunger and has undermined progress in reducing all forms of malnutrition, particularly in low- and middle-income countries within the Global South.⁵¹ Households in Cambodia, Indonesia, Lao People's Democratic Republic, Myanmar, Mongolia, Philippines, and Solomon Islands suffered income losses, including farm and non-farm losses, and lower wages and remittances, based on a study by the World Bank High-Frequency Phone Surveys (HFPS). From this survey, about 75 per cent in Cambodia responded that as a result of income loss there is a reduc-

48. FAO et al. 2021. The State of Food Security and Nutrition in the World 2021, p. v.

49. FAO et al. 2021. The State of Food Security and Nutrition in the World 2021, p. 6.

50. HLPE. 2020. Impacts of COVID-19 on food security and nutrition, p. 10.

51. FAO et al. 2021. The State of Food Security and Nutrition in the World 2021, p. xxiii.

tion in purchasing power for the goods to consume during the pandemic.⁵² Due to its universality, the pandemic affects most of the stated drivers of food security and caused heavier burdens for the already affected states of the Lower Mekong Basin.

Demography: Food and Income

Since poverty amplifies the risk of suffering from malnutrition, poor people and low-income families are more likely to be affected by different forms of malnutrition. Both undernutrition and overnutrition directly and indirectly correlate with poverty.⁵³ According to FAO, people living on less than US\$1.90 per day spend up to 80 per cent of their income on food.⁵⁴ "Informal workers in Thailand reported receiving only 27 per cent of their pre-pandemic average monthly salary, putting them near the extreme poverty level of US\$1.90 per day."⁵⁵ Therefore, due to lack of accessibility, rising prices or insecurity, people affected by poverty can often be unable to afford to buy food in the quality and quantity needed for a diverse and healthy diet.⁵⁶

Approximately 462 million adults worldwide were underweight in 2014, while 1.9 billion were either overweight or obese, because of demographic drivers connected to income. Both groups can be considered as suffering from forms of food insecurity. In 2016, an estimated 155 million children under the age of 5 were suffering from stunting, while 41 million were overweight or obese.⁵⁷ In one way or another, every country in the world is affected by some form of malnutrition since combating malnutrition in all its forms is one of the greatest global health challenges.

52. FAO. 2022. Thirty-Sixth Session of the FAO Regional Conference for Asia and the Pacific. Report: Bangkok, 2022, p. 4. Accessed 7 October 2022. (<https://www.fao.org/events/detail/aprc36/en>).

53. FAO. 2022. Report, p. 24.

54. FAO, IFAD, UNICEF, WFP and WHO. 2020. The State of Food Security and Nutrition in the World 2020.

55. FAO. 2022. Report, p. 4.

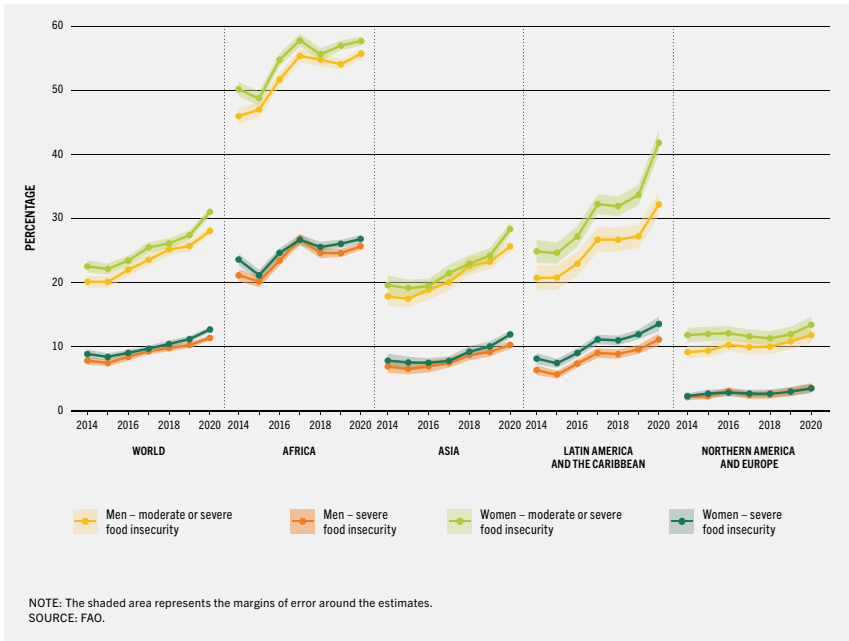
56. Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH. 2021. Position Paper of the Sectoral Department: Nutrition. Accessed 2 May 2022. ([https://www.giz.de/expertise/downloads/4D30_PP_Nutrition_EN%20\(2020\).pdf](https://www.giz.de/expertise/downloads/4D30_PP_Nutrition_EN%20(2020).pdf)).

57. WHO. 2022. Malnutrition.

Generally, malnutrition increases health care costs, reduces productivity, and slows economic growth, which can perpetuate a cycle of poverty and ill-health.⁵⁸ “While many forms of malnutrition are obvious, some two billion people worldwide are affected by ‘hidden hunger’: that is, they lack an adequate supply of vitamins and minerals, such as iodine, iron and vitamin A”.⁵⁹

Socio-Cultural: Food and Gender

Figure 2. Globally and in every region, the prevalence of food insecurity is higher among women than men.⁶⁰



58. WHO. 2022. Malnutrition.

59. Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH. 2021. Position paper of the sectoral department, p. 1.

60. FAO et al. 2021. The State of Food Security and Nutrition in the World 2021, p. 22.

“At the global level, the gender gap in the prevalence of moderate or severe food insecurity has grown even larger in the year of the COVID-19 pandemic, with the prevalence of moderate or severe food insecurity being 10 per cent higher among women than men in 2020, compared with 6 per cent in 2019”.⁶¹

Women and girls are important key role players in the whole food supply chain. They are responsible for household food production, sustaining the agricultural land, buying and mostly carrying the products home, and preparing, cooking as well as serving food to the family. Due to societal and cultural norms in the Global South, women and girls play significant roles in maintaining the three pillars of food security: food production, economic access to available food, and nutrition security. Most often, those predefined gendered roles are directly linked to a lack or the impossibility of access to education for girls and women, thus bonding them to fulfilling household duties.⁶²

Additionally, even though female farmers often work together with their husbands on the land, due to norms constraining women to the household, they are generally limited in terms of user rights and are rendered invisible to the public. There are common patterns in the division of public and non-public aspects of labour among men and women in rice agriculture.⁶³ Men do specific tasks, including seedbed and land preparation, fertilizer spraying and pesticide application. Transplanting, weeding, manual harvesting, and post-harvest activities are shared by men and women, but they are generally regarded as men’s activities. The preparation of lunch and snacks for hired labourers and their delivery to the field as well as preparation of dinner for the household are only regarded as female activities. Even though men and women work together in the field, access to resources such as land ownership, credit to purchase agricultural inputs, leadership and membership in

61. FAO et al. 2021. *The State of Food Security and Nutrition in the World 2021*, p. xvi.

62. Quisumbing, Agnes R., Lynn R. Brown, Hilary Sims Feldstein, Lawrence Haddad, and Chistine Peña. 1996. *Women: The Key to Food Security*. *Food and Nutrition Bulletin* 17, no. 1. IFPRI food policy statement, pp. 1-2. Accessed 6 October 2022. (<https://journals.sagepub.com/doi/pdf/10.1177/156482659601700116>).

63. Quisumbing et al. 1996. *Women: The Key to Food Security*, pp. 1-2.

agricultural and non-agricultural organisations and access to extension services are dominated by men.⁶⁴

However, Asia's female labour participation rate declined by 1.3 per cent compared to a 1 per cent fall for males between December 2019 and June 2020. 50 per cent of women in formal employment have had their paid work hours reduced compared to the start of the pandemic, in contrast to 35 per cent for men. Within the food and agriculture industry, an estimated 66 per cent of women and 57 per cent of men in the region noted an income drop from farming and fishing.⁶⁵

"FAO concluded that, if women had the same access to productive resources as men, they could increase yields on their farms by 20–30 per cent globally. This could raise total agricultural output in the Global South by 2.5–4 per cent, which could in turn reduce the number of people suffering food insecurity and hunger in the world by 12–17 per cent".⁶⁶

Women's economic access to food comes through one or more of three means. The first means is obtaining food through their own production when they have access to resources and assets. This may contribute to their autonomy and empowerment in their households and may also contribute to insulating their households from high food prices and malnutrition. The second means is purchasing food with income from waged employment, which could be from the farm or self-employment. Finally, the third means is accessing food through redistributive mechanisms in the form of government- and non-governmental organisation-supported social protection measures, or through informal forms of solidarity within households or communities.⁶⁷ However, such changes in the food supply system would require social protection, which plays an essential role in assuring food security. Such social

64. Akter, Sonia, Pieter Rutsaert, Joyce Luis, Nyo Me Htwe, Su Su San, Budi Raharjo, and Arlyna Pustika. 2017. Women's Empowerment and Gender Equity in Agriculture: A Different Perspective from Southeast Asia. *Food Policy* 69, pp. 270-79. (<https://doi.org/10.1016/j.foodpol.2017.05.003>).

65. FAO. 2022. Report, p. 8.

66. Schutter. 2013. Gender equality and food security, p. 19.

67. Schutter. 2013. Gender equality and food security, pp. 71-74.

protection can be provided on an informal basis by family and community networks, by non-government organisations, or through formally organised programmes by the government and local collectives.⁶⁸

The Asian Development Bank (ADB) supported a \$17.5 million fund grant and a \$11.6 million loan to the Cambodia Emergency Food Assistance Programme. This programme aims to help the government of Cambodia meet unexpectedly high costs for food, fuel and agricultural inputs arising from the safety net programmes for the poor and vulnerable. The programme was implemented in seven provinces in the Tonle Sap Basin and urban slums of Phnom Penh. After being revised in June 2009, the programme was expanded to a larger number of geographical areas in September 2012. The programme benefited a total of 500,000 people (89,000 households) in its initial phase. The food-for-work and cash-for-work programmes supported the creation of infrastructure for small-scale farmers and a majority of women farmers to increase their productivity and incomes. A recent assessment of the programme showed that 22,756 female-headed households benefited from free rice distribution (around 12,000 tons of rice was distributed during the food-lean period of late October/early November 2008); 31,555 girls benefited from a school feeding programme; 5,510 girls were awarded scholarships; 6,453 female-headed households had access to a food-for-work programme; 127 female volunteer teachers for the early childhood learning centres had access to a monthly rice grant; and 47,150 women (including 8,937 female-headed households) earned an income through a cash-for-work programme. Furthermore, a total of 13,841 female-headed households benefited from the distribution of quality seeds and subsidised sale of fertilizers. This is an example of a social protection programme from Cambodia investing in women to build resilience in times of crises.⁶⁹

Because of the COVID-19 pandemic and subsequent economic crisis, prices for food, fuel, as well as requirements for agriculture such as fertilizers and machines were found to be rising rapidly in the Mekong riparian

68. Quisumbing et al. 1996. *Women: The Key to Food Security*, p. 2.

69. Schutter. 2013. *Gender equality and food security*.

states. Hence, such kinds of social protection programmes can be extended in the Mekong riparian states to support food security and fulfil Sustainable Development Goal 2 (SDG 2).⁷⁰

Discussion: Bridging Food Security and Gender Mainstreaming

As the world continues to face mounting demographic pressures, access to food and stable nutrition will be challenged while the demand for accessible and affordable food will surge. Increasing urbanisation, deteriorating agricultural spaces, and resource scarcity all work to exacerbate economic, political, and social drivers of conflict. Looking at it from a socio-economic perspective, malnutrition increases health costs and seriously affects people's livelihoods.⁷¹ For instance, overweight and obesity are associated with a higher risk of non-communicable diseases (NCDs). This can easily become a substantial financial burden, particularly in low-income households in the Global South. Mendelson Forman states in a policy memo at Stimson that fighting food insecurity requires a dynamic and comprehensive policy approach reflecting the issue's natural integration of economics, development, and national security while recognising gender-sensitive needs.⁷² Women, infants, children, and adolescents are at particular risk of malnutrition. In addition, women of reproductive age and infants in their first 1,000 days, from conception to their second birthday, need special attention.⁷³ Consequently, looking at the growing demand for water, food, energy, and other consumption goods, combined with increased resource scarcity, authors such as Ra-

70. United Nations. 2022. The Sustainable Development Goals Report 2022. New York: United Nations. Accessed 3 September 2022. (<https://sdgs.un.org/goals#goals>).

71. Johanna Mendelson Forman. 3 March 2020. Ensuring the Future of Food Security. Policy Memo: The Stimson Center. Accessed 4 May 2022. (<https://www.stimson.org/2020/ensuring-the-future-of-food-security/>).

72. Mendelson Forman. 2020. Ensuring the Future of Food Security.

73. Deutsche Gesellschaft für Internationale Zusammenarbeit GmBH. 2022. Food and Nutrition Security. Accessed 3 May (<https://www.giz.de/expertise/html/60135.html>).

sul et al.⁷⁴, De Schutter⁷⁵, Akter et al.⁷⁶ and Quisumbing et al.⁷⁷ rightly stress the need for integrated solutions.

At the Mekong River Commission, gender mainstreaming policies have been laid out at two different levels – institutional level and national level.⁷⁸ At the institutional level, the MRC has been advocating for gender mainstreaming by integrating gender aspects into all their strategies and plans, while at the same time strengthening the technical capacity and accountability system for gender mainstreaming in the technical work at the MRC. Furthermore, the internal aspect cannot be overlooked, in the sense that the institution has promoted a gender-sensitive organisational culture and working environment among colleagues. Externally, the institution should also take a further step to promote gender mainstreaming through dialogues and training with the relevant stakeholders by applying and sharing the developed gender guidelines and toolkits. Meanwhile, at the national level, the respective members have developed their own national gender strategies and plans, in which the MRC has taken an active role in supporting the national agencies in mainstreaming gender into their respective initiatives and implementation, including capacity building, training on gender-related topics, and recognising gender equality as one of the national priorities to increase equitable economic and social development. On the side lines, the MRC developed a *Gender Responsiveness Plan*⁷⁹ in order to support the member countries to mainstream gender into their respective development plans, particularly in climate change and adaptation.⁸⁰

The MRC Indicator Framework includes three gender indicators: (i) gender equality in ownership of land, (ii) gender equity in education, and (iii) female-male ratio of people employed in the Lower Mekong Basin (LMB) wa-

74. Rasul et al. 2021. Beyond hydropower: towards an integrated solution for water, energy and food security in South Asia.

75. Schutter. 2013. Gender equality and food security.

76. Akter et al. 2017. Women's empowerment and gender equity in agriculture: A different perspective from Southeast Asia.

77. Quisumbing et al. 1996. Women: The Key to Food Security.

78. Mekong River Commission. 2013. Commitment on Gender Mainstreaming.

79. Climate Change and Adaptation Initiative. 2013. Gender Responsiveness Plan (Working Paper).

80. Mekong River Commission. 2013. Commitment on Gender Mainstreaming.

ter-related sectors.⁸¹ Positive effects of these three indicators can improve the accessibility aspect of food security and nutritional outcomes. As outlined throughout the paper, gender equity is the key to sustainable development for the Global South. Mainstreaming gender sensitivity into development policies can significantly contribute to economic growth and poverty reduction in the riparian states, which further narrows the gender gaps and increases the access of men and women to safe and sufficient food. Furthermore, by ensuring the equality of genders and empowering women in all sectors, the Mekong countries will be able to achieve the Sustainable Development Goals. According to the 17 SDGs, actions like *zero hunger* (SDG 2) or *decent work and economic growth* (SDG 8) must go hand-in-hand with *gender equality* (SDG 5).⁸²

We have sharply stated how tightly linked and important gender-sensitive public policies and improved nutritional outcomes are for agricultural investment and rural development. Women in Asia and the Pacific region face obstacles in all their roles as food producers, providers, and preparers, mostly due to socio-cultural, demographic as well as natural drivers such as COVID-19. They are affected as waged workers both on and off farms, as beneficiaries of social protection measures, and as primary caregivers, particularly during the early years of a child's life. By removing these obstacles, not only will women and girls gain, but also all of society will benefit because of enhanced human capital as well as the significant improvements in food security arising from diversified ways of contribution.⁸³

Hence, we strongly support that policy implementation must be linked with gender-sensitivity mainstreaming and this requires every sector's involvement in terms of food security: the agriculture sector, rural development sector, education sector, financial sector of government organisations and other organisations should all together consider implementing gender-sensitive policies.

81. Mekong River Commission. 2013. Commitment on Gender Mainstreaming.

82. United Nations. 2022. The Sustainable Development Goals Report, pp. 28-30, 36-38.

83. Schutter. 2013. Gender equality and food security, pp. 74-78.

Policy Recommendations for Safe Food for All Genders

1. Women and girls are keenly aware of the needs of their households and local communities: Active promotion of a stronger representation of women at an early stage through, for instance, educational programmes, low-level engagement or thematic sponsorship is needed.
2. Women are underrepresented in decision-making bodies within relevant stakeholder groups like the Mekong River Commission: There is a need for an integrated approach for a more balanced representation of women in decision making and policy implementation to address unequal nutrition supply, food insecurities, and integrated water management frameworks.⁸⁴
3. Food security and food-related impacts from instabilities arising from climate change should be adequately captured in the Nationally Determined Contributions (NDCs) of MRC member countries.
4. Development of a more gender-balanced policy framework at the transregional level by the Mekong River Commission states, where the interests of indigenous communities and marginalised gender groups are holistically accommodated.
5. For conflict-affected areas, humanitarian, development, and peace-building policies should be developed together.⁸⁵
6. The interventions should be pro-poor and inclusive to tackle poverty and structural inequalities.⁸⁶

84. Vishwanath, Ambika. 2022. The Women, Water, and Policy Nexus: Addressing Gender Inequality in Water Management. Decades of gender inequalities in existing water management systems is a social and economic. Accessed 4 May 2022. (<https://www.stimson.org/2022/the-women-water-and-policy-nexus/>).

85. FAO et al. 2021. The State of Food Security and Nutrition in the World 2021, p. xx.

86. FAO et al. 2021. The State of Food Security and Nutrition in the World 2021, p. xx.

7. There should be technical and policy support for COVID-19 recovery actions for *building back better* (inclusive recovery) and green agrifood transformation (sustainable and resilient recovery).⁸⁷

CONCLUSION

In conclusion, food insecurity and malnutrition are serious threats to all individuals as well as the general development of countries within the Lower Mekong Basin. As shown in the data presented, food insecurity presents substantial challenges to human health and wellbeing through higher disease and mortality rates, which further affect the economic development of the Mekong countries. Particularly in the Mekong region, the MRC is not focusing enough on food security, though it is closely related to water security and management. The countries in the Mekong Region currently face double or triple burdens of malnutrition, as they are simultaneously affected by undernutrition, micronutrient deficiencies and overweight, caused by a lack of accessibility and availability, insufficient utilisation, and instability.⁸⁸

It can be said that, as a consequence of gender inequality combined with the pandemic and regional conflicts, the Mekong riparian states face serious food insecurity conditions. It has been proven that women play a key role in the three pillars of food security: food production, economic access, and nutritional security; thus gender mainstreaming and women empowerment in the food system must be addressed accordingly.⁸⁹ Land ownership, one of the gender indicators of the MRC Indicator Framework, is a major determinant of the ability of rural women to improve the productivity of the land they use, to rebalance decision-making power within the household, and to raise their status in the household, the community as well as society.⁹⁰ Providing basic food safety, nutritional education, and agriculture technology training to women can raise the production of safe and nutritious food. Ad-

87. FAO. 2022. Report, p. 2.

88. Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH. 2021. Position paper of the sectoral department, p. 2.

89. Quisumbing et al. 1996. Women: The Key to Food Security, pp. 1-2.

90. Schutter. 2013. Gender equality and food security, pp. 74-78.

ditionally, creating incentive programmes, job opportunities for women or financial support to women leading small and medium-sized enterprises will not only increase their income, but will also increase their economical stability to afford food. Lastly, more investments in women and their maternal healthcare will enhance the nutritional security of both women and children since care work in Asian countries is still predominantly a gendered job.⁹¹

Therefore, food security is the essence of the Mekong states' development strategy and should be addressed properly through gender mainstreaming as well as new concepts for female support, optimally developed by the Mekong River Commission to break the cycle of poverty and to increase economic growth.

91. Quisumbing et al. 1996. Women: The Key to Food Security, pp. 1-2.

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