

Key Messages:

- The implementation of the Comprehensive Asia Development Plan 3.0 (CADP 3.0) strategy is recommended for both the Association of Southeast Asian Nations (ASEAN) and each ASEAN Member State (AMS), as the Institute of Developing Economies (IDE) and Economic Research Institute for ASEAN and East Asia (ERIA) geographical simulation model (IDE/ERIA-GSM) results show that the strategy could accelerate economic development and simultaneously achieve high gross domestic product (GDP) and geographical inclusiveness.
- While the coronavirus disease (COVID-19) had a negative impact on people's health, it paved the way for the development of hybrid societies requiring both physical and online contact. To cope with an evolving society, both transport and digital infrastructure are needed. As there is no fixed order between the two types of infrastructure, Cambodia could leap forward by addressing digital infrastructure.
- East Asia, which is developing and integrating, has high potential for infrastructure development to link neighbouring countries. The Lao People's Democratic Republic (Lao PDR) results show that infrastructure development linking neighbouring countries has a significant economic impact not only on the neighbouring countries but also on the Lao PDR.
- With COVID-19, governments have adopted a policy of reducing physical contact amongst people and are spending money on infection control and social security. As a result, delays in transport infrastructure projects have been reported in various parts of ASEAN, with analysis showing that such delays could have a negative impact on rural areas, particularly on physical infrastructure. Now that the recovery phase is under way, efforts should be made to catch up with the original schedule.

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Geographical Simulation Analysis for CADP 3.0

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The economic impact of the development of transport and digital infrastructure and the adoption of energy-saving technologies envisaged in the Comprehensive Asia Development Plan 3.0 (CADP 3.0) was analysed using the Institute of Developing Economies (IDE) and Economic Research Institute for ASEAN and East Asia (ERIA) geographical simulation model (IDE/ERIA-GSM). This infrastructure development and technology adoption will affect all industries and change the structure of the economy as the basis for rejuvenated and advanced industries such as agriculture, automotives, medicine, and pharmaceuticals. By combining this infrastructure development and technology adoption, the Association of Southeast Asian Nations (ASEAN) and East Asia could achieve high economic impacts and geographical inclusiveness. The Lao People's Democratic Republic will obtain the greatest economic impact as it transitions from a landlocked to a land-linked country. Cambodia will also reap significant benefits from upgrading information and communication technology. The simulation results thus recommend the implementation of the CADP 3.0 strategy for both ASEAN and individual Member States.

Measuring the Economic Impact of the CADP 3.0 Strategy

The Comprehensive Asia Development Plan 3.0 (CADP 3.0) presents an integrated, innovative, inclusive, and sustainable economic development strategy for the Association of Southeast Asian Nations (ASEAN) and East Asia region in an increasingly complex world, by highlighting the improvement of physical and digital connectivity as well as the deployment of energy-efficient technologies (ERIA, 2022). CADP 3.0 was reported to the East Asia Summit Economic Ministers' Meeting in September 2022, and the research and analysis of regional economic issues by the Economic Research Institute for ASEAN and East Asia (ERIA), including CADP 3.0, was commended by the heads of the East Asia Summit member states (ASEAN, 2022). What will be the economic impact on ASEAN and East Asia when transport infrastructure development, digital economy infrastructure development, and the adoption of energy-saving technologies, as described in CADP 3.0, take place? The Institute of Developing Economies (IDE) and ERIA geographical simulation model (IDE/ERIA-GSM) provides a broad overview of what the CADP 3.0 strategy would achieve (Kumagai and Isono, 2022).

The IDE/ERIA-GSM is an applied general equilibrium model based on spatial economics. The simulation model has provided analysis for CADP and CADP 2.0, and has been used in policy reports such as the Master Plan on ASEAN Connectivity and ASEAN Vision 2040. The IDE/ERIA-GSM is suitable for estimating the economic impact of integrated CADP 3.0 strategies for three reasons. First, the simulation model can accommodate changes in economic structure. Second, several different policies can be analysed with one tool. Third, the economic impact of combining those policies can be analysed.

In East Asia, the economic structure is changing dramatically. In 2000, Japan was the largest exporter in the region and was a leader in value added creation in exports. In 2020, China had taken over this role and it is now the largest exporter in East Asia (Figure 1). Furthermore, trade between ASEAN and China has increased 15-fold in the last 2 decades, indicating an increased economic division of labour and interdependence between ASEAN and China. ASEAN has also shown solid growth in value added, surpassing Japan in its contribution to value added in exports to the United States and the European Union.

Policy interests in ASEAN and East Asia have also shifted and expanded. The steady progress of transport projects in the region is shifting policy attention from infrastructure connecting major cities to intra-urban transport, rural infrastructure, and the expansion of

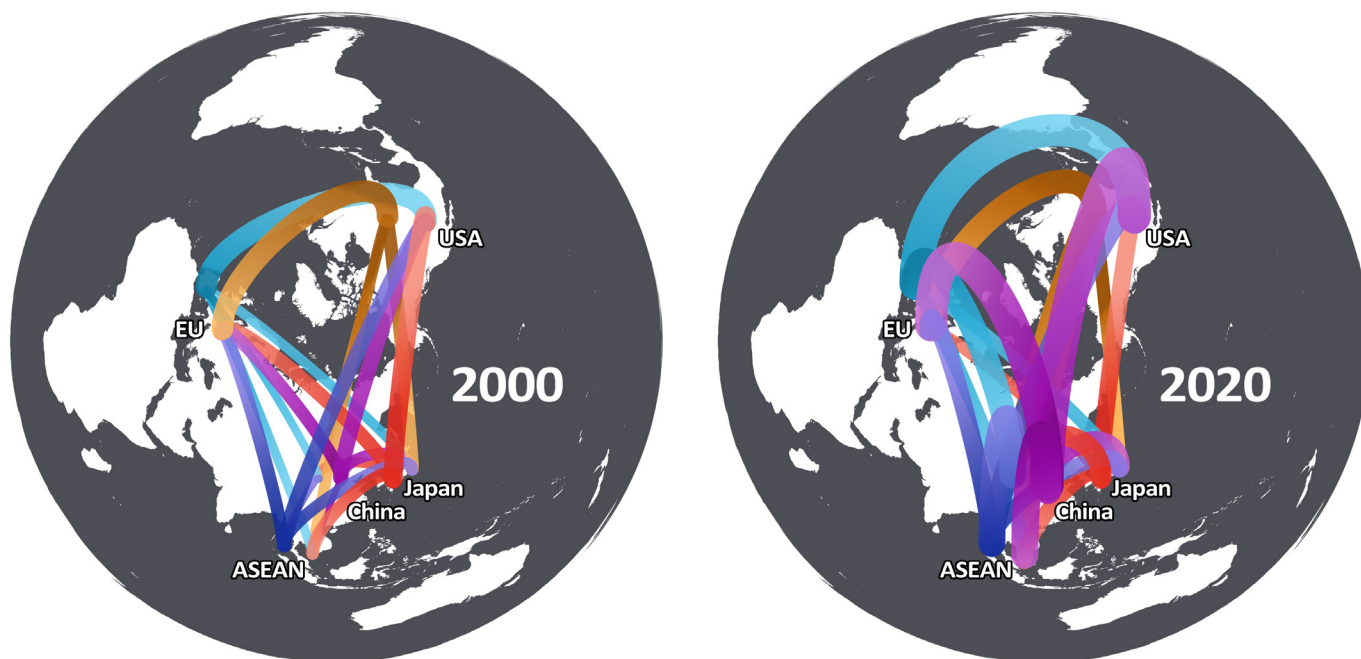
existing infrastructure. In addition, major challenges are arising, such as recovering from the coronavirus disease (COVID-19), dealing with geopolitical tensions, and establishing a framework to achieve sustainable development.

The achievement of ambitious economic measures will lead to further changes in the economic structure. The IDE/ERIA-GSM looks at how each policy, or combination of policies, changes the behaviour of businesses and consumers. The model does not calculate economic impacts as coefficients multiplied by the number of units, but by generating the new economic situation resulting from changes in the behaviour of firms and consumers in the model and their interaction when policies and the external environment change (Figure 2). Therefore, the use of the IDE/ERIA-GSM is appropriate to deal with the changing economic structure in East Asia, the expanding policy interests, and the context of the ambitious economic measures of CADP 3.0.

Results and Policy Relevance

The analysis comprises four individual scenarios and two combined scenarios. The first, the physical transport infrastructure scenario, deals with construction projects such as road, port, and airport construction. The new infrastructure assumed in this physical infrastructure scenario refers to the CADP 3.0 hard infrastructure list. The second, the information technology (IT) impact scenario, deals with IT infrastructure for digital economy upgrading. The third, the communication technology

Figure 1: Changing Trade Structure



ASEAN = Association of Southeast Asian Nations, EU = European Union, USA = United States.
 Source: Authors, based on United Nations (n.d.), UN Comtrade Database. <https://comtrade.un.org/> (accessed 18 October 2022).

Figure 2: Deriving Economic Impacts in the IDE/ERIA-GSM



AMS = ASEAN Member State, ASEAN = Association of Southeast Asian Nations, ERIA = Economic Research Institute for ASEAN and East Asia, GDP = gross domestic product, GSM = geographical simulation model, IDE = Institute of Developing Economies.
Source: Authors.

(CT) impact scenario, includes the development of telecommunications technology upgrading as well as institutional connectivity strengthening related to the digital economy taking place bilaterally and in ASEAN. In the model, IT affects productivity while CT enhances connectivity. The fourth, the introduction of new technologies for energy efficiency and conservation, assumes the introduction of technologies to achieve ambitious energy efficiency and conservation targets set and recommended by ERIA (Kimura and Han, 2021). Improvements and upgrading in these four areas will form the basis for the upgrading of all industries, such as agriculture, automotives, medicine, and pharmaceuticals. In other words, they are the basis for an integrated, innovative, inclusive, and sustainable ASEAN and East Asian economy, as envisaged in CADP 3.0.

The first combined scenario estimates the economic situation under which these infrastructure development and technology adoption in these four scenarios are implemented. In addition, the second composite scenario, the 'All' scenario, adds the remaining key infrastructure projects that are not included in the list of physical infrastructure projects but could have a significant impact on the ASEAN economy.

In the 'All' scenario, ASEAN and East Asia will achieve both high economic impacts and geographical inclusiveness (Figures 3 and 4). Areas achieving high economic impact vary from one scenario to another, and the combination of the infrastructure development and technology adoption specified in the four scenarios and additional key infrastructure projects results in many regions of ASEAN achieving high economic impacts, as well as positive economic impacts for ASEAN's neighbouring countries.

In the Lao People's Democratic Republic (Lao PDR), physical transport infrastructure projects have a significant positive impact on the northern region. This is because many projects, including the China-Lao PDR

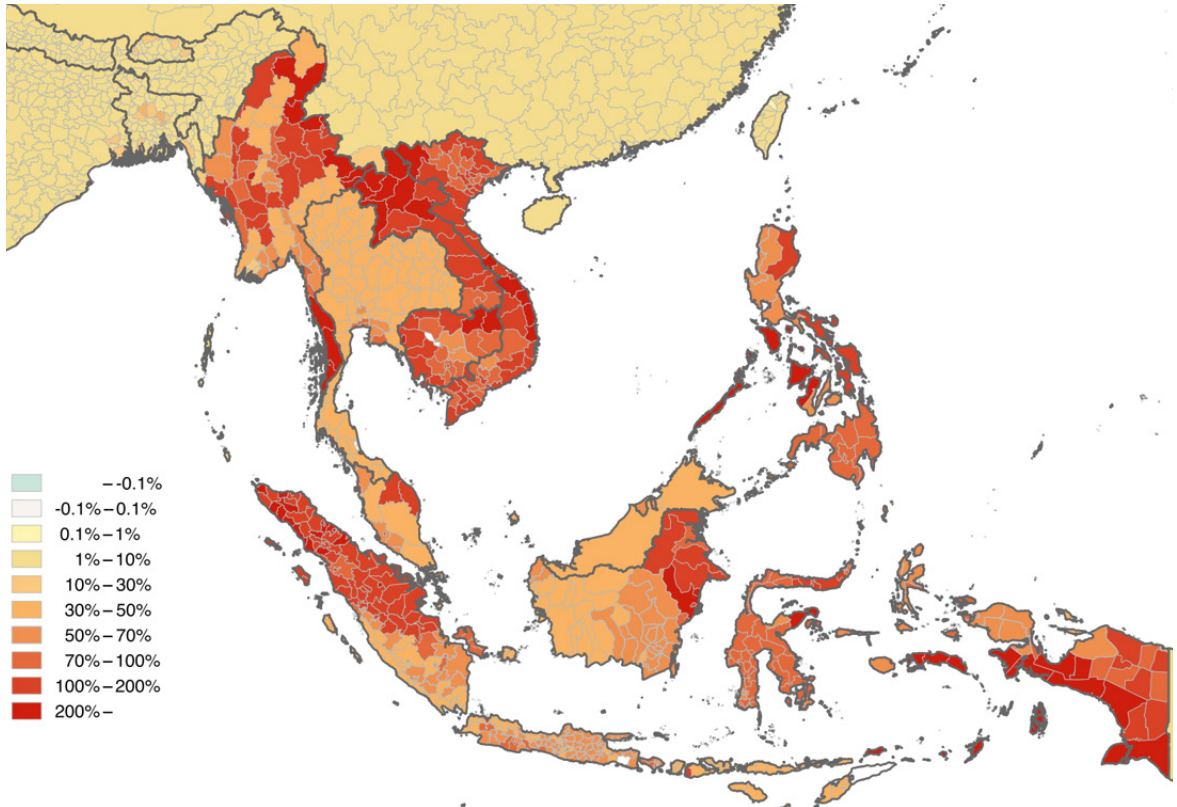
railway, have been completed and are progressing because of the high geographical potential. This is a clear indication that the Lao PDR's strategy of moving from a landlocked to a land-linked country will not only benefit neighbouring countries but will also be beneficial within the Lao PDR (Nishimura et al., 2016). Physical transport infrastructure projects also have a relatively large impact on the eastern Indonesian archipelago, central Philippines, and northern Myanmar. These are in line with the shift of focus on infrastructure development in each country to rural areas.

Cambodia will experience high economic impacts from both IT and CT projects for digitalisation. This is because Cambodia is a frontrunner in opening up its service sector and has large room for economic development, and accelerating digitalisation at this stage will have a significant impact by facilitating structural changes in the economy.

In the 'All' scenario, where major infrastructure projects are added, even higher economic impacts are achieved in more areas. These major infrastructure projects include the completion of the Hanoi-Ho Chi Minh City highway, the upgrading of the Poipet-Phnom Penh-Bavet highway, the upgrading of major intra-ASEAN shipping routes, and customs facilitation at land borders.

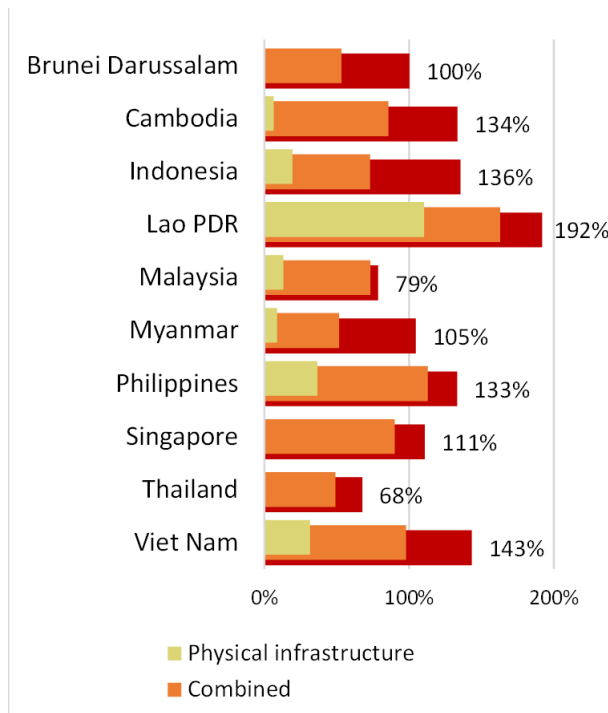
Compared with CADP and CADP 2.0, the economic impact of additional major infrastructure projects in CADP 3.0 is smaller. This is because ASEAN Member States (AMS) have already completed, or are about to complete, a highway project linking the major cities of ASEAN, which had not been completed a decade ago and has the greatest economic impact on each AMS. Having completed these projects, the AMS, and Indonesia in particular, are moving to the stage of embarking on highway projects connecting the rest of the country to distribute the benefits of economic integration across the country. The policy of raising gross domestic product (GDP) rests on promoting the digital economy and providing urban transport in large cities.

Figure 3: Economic Impact of 'All' Scenario



Note: Economic impact is expressed as a cumulative 2026–2035 impact compared to the baseline scenario. Data are not available for Timor Leste. Source: Kumagai and Isono (2022).

Figure 4: Economic Impact of Selected Scenarios on ASEAN Member States



ASEAN = Association of Southeast Asian Nations. Note: Economic impact is expressed as the cumulative 2026–2035 impact compared with the baseline scenario. Source: Kumagai and Isono (2022).

Many AMS have pursued infrastructure projects in the optimal order within an integrated Asia: building a gateway port, connecting the gateway port to the largest economic city, and connecting the major national cities. However, AMS do not have to wait for major highways to be completed to develop their digital infrastructure. Leapfrogging is particularly helpful for the newcomer AMS (Cambodia, the Lao PDR, Myanmar, and Viet Nam) in making them more competitive.

Policy Recommendations

The results of this analysis lead to the following policy recommendations:

- 1) The results of the IDE/ERIA-GSM show that the CADP 3.0 strategy could accelerate economic development and simultaneously achieve high GDP and geographical inclusiveness. Implementation of this strategy is recommended for both ASEAN and individual AMS.
- 2) The results for the Lao PDR show the importance of infrastructure in linking neighbouring countries. This has great economic impacts not only on the neighbouring countries but also on the Lao PDR. Although some infrastructure projects may not see an immediate increase in utilisation when they are first operationalised, some projects that significantly transform society and the economy should be implemented strategically with the help of analytical methods such as the IDE/ERIA-GSM, bearing in mind that they will have a cumulative effect over the medium to long term.
- 3) While COVID-19 has had a negative impact on people through infection, it has also paved the way for the development of a hybrid society that requires the use of both physical and online contact. Both transport and digital infrastructure are needed to accommodate the evolving society. Since there is no predetermined sequencing between the transport and digital infrastructure, Cambodia can expect leapfrogging in economic development by working on digital infrastructure at this stage. Both need to be promoted while adapting to the specific circumstances of each AMS.

- 4) With COVID-19, governments have adopted a policy of reducing physical contact between people and have invested in infection control and social security. This has led to reported delays in transport infrastructure projects in various parts of ASEAN. The analysis shows that delays, particularly in physical infrastructure, are likely to have a negative impact on rural areas. Now that the recovery phase is under way in most countries, efforts should be made to catch up with the original schedule.


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