Stockholm Environment Institute

Mapping potential climate and development impacts of China's Belt and Road Initiative: a participatory approach

SEI discussion brief. Oct 2018

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Introduction

Launched by President Xi Jinping in 2013, China's Belt and Road Initiative (BRI) represents the country's unprecedented ambition to increase connectivity, strengthen cooperation, facilitate trade and financial integration and enhance people-to-people exchange through six regional economic corridors (Roland 2018). So far, more than 68 countries across Asia, Europe and Africa have joined the BRI, covering 65% of the world's population and 40% of global gross domestic product (Campbell 2017). Meanwhile, a range of new financial mechanisms – such as the Asian Infrastructure Investment Bank and the Silk Road Fund – have been established to catalyse the vast levels of investment in transportation, energy and communications infrastructure needed to make the BRI a reality.

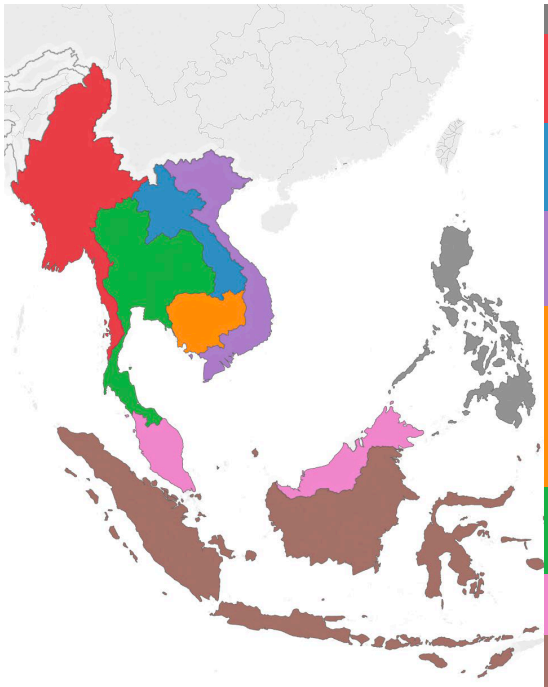
With extensive natural resources and geographical proximity to China, Southeast Asia is critical to the implementation of BRI. The ASEAN region is already one of China's largest trading partners and, between 2013 and 2015, ASEAN member states received over 60% of Chinese overseas direct investment to BRI countries (EIU 2017). In addition to bilateral agreements with countries in the region, China established the Lancang-Mekong Cooperation Fund in 2015 to support the construction of infrastructure within the Mekong region (Pantucci and Lain 2016; Aoyama 2016; Zhu and Zhu 2016). BRI offers an opportunity for much-needed infrastructure investment in Southeast Asia to catalyse economic growth and eradicate poverty: The Asia Development Bank has estimated that the region requires infrastructure investments of around US$3.15 trillion by 2030 (Black 2017). At the same time, BRI investments raise other potential risks, ranging from economic and geopolitical risks to resource, environmental and climate risks (Huang 2016; Cheng 2016; Aoyama 2016; Blanchard and Flint 2017). Indeed, situations such as the transfer to China of the port it funded in Sri Lanka has heightened fears that BRI investments may become a potential debt trap for some Southeast Asian countries, such as Cambodia and Laos (Abi-Habib 2018; Hurley et al. 2018).

An important question asks whether BRI investments will contribute or undermine global efforts to tackle climate change and pursue sustainable development (Chao 2018). If BRI investments are 'green' and low carbon, they can be a strong engine promoting and leading the way for the environmentally sustainable and resilient infrastructure development that is essential for achieving the global sustainable development goals (SDGs) and especially for tackling climate change. If they are 'brown' and carbon-intensive, it could result in significant carbon lock-in, exacerbating the climate change threat. Furthermore, the social, environmental and climate change consequences of BRI projects will be unevenly distributed across different geographies, social groups and timescales.

China has openly stated its commitment to ensuring BRI investments meet environmental and sustainability standards and to developing a green BRI. Yet the sheer size of the initiative and its vast coverage of diverse environmental, socio-economic and political contexts pose a tremendous challenge to turning green rhetoric into reality on the ground. Meanwhile, China's past environmental

Photo (above):
Tsing Ma Bridge© HENRY CHEN / FLICKR

Figure 1. Selected BRI projects in Southeast Asia



	Transportation infrastructure	Energy infrastructure	Special zones
Myanmar	Deep-sea port in the Kyaukpyu special economic zone (planned) Kunming-Kyaukpyu road (planned)	China-Myanmar crude oil pipeline (completed) China-Myanmar gas pipeline (completed)	Industrial park in Kyaukpyu special economic zone (completed)
Laos	China-Laos railway (under construction) Laos-China expressway (planned)	Nam Ou Cascade hydropower projects 1,3,4,7 (Phase II) (under construction)	Saysettha comprehensive economic development zone (under construction) Mohan-Boten cross-border economic co-operation zone (planned)
Vietnam	Kunming-Hanoi highway (completed) Hanoi light rail (under construction) Kunming-Hanoi road (planned)	China-Laos-Vietnam grid connection (planned) Vinh Tan 1 coal-fired power plant (under construction)	Vietnam Longjiang industrial park (completed)
Cambodia	New Siem Reap international airport (planned) Phnom Penh-Sihanoukville expressway (under construction) Major bridges (completed) National road No. 6 (completed) A new container terminal at the Phnom Penh autonomous port (completed)	Lower Sesan II hydropower plant (completed) Tatay River hydropower plant (completed) Power transmission system in Prey Veng Province (completed)	Sihanoukville port special economic zone (completed)
Thailand	Kunming-Bangkok highway (completed) China-Thailand high-speed railway (planned)		China-Thailand (Rayong) industrial zone (completed)
Malaysia	East Coast rail link (planned)		Malaysia-China Kuan Tan industrial park (completed)
Indonesia	Jakarta-Bandung high-speed railway (under construction)		China-Indonesia Julong agricultural industry co-operation zone (completed) China-Indonesia economic and trade co-operation zone (under construction) Indonesia Morowali industrial park (under construction)

Compiled from sources listed in a separate section of References

record and its authoritarian institutions – as well as those of some BRI recipient countries – are also cause for scepticism (Ortolani 2018). In addition to strong regulation and standards, a green BRI requires nothing less than an open and inclusive planning process where all concerns can be deliberated. It is to address this challenge that we propose, in this discussion brief, a participatory approach to mapping environmental and climate consequences alongside social and economic outcomes to give decision makers and concerned groups within China and Southeast Asian countries a broader understanding of the various implications associated with trade-offs and synergies resulting from BRI infrastructure investments.

2. Environmental and climate risks of BRI investments in Southeast Asia

Will BRI investments enhance or undermine global efforts to tackle climate change, environmental degradation and social inequality? For Southeast Asia countries, the Belt and Road Initiative can strengthen connections within the region and facilitate economic growth. However, infrastructure is a long-term investment with long-term consequences: Governments of recipient countries need to acknowledge that decisions around infrastructure development involve significant social, economic and environmental trade-offs and to plan accordingly. Figure 1 outlines some infrastructure-related BRI projects in Southeast Asia. Some of them were implemented before the launching of BRI but are still designated as BRI projects. In terms of energy infrastructure investment, most of it focuses on coal-fired power plants, hydropower dams and power transmission lines.

Southeast Asia accounts for about 23% of the total Chinese-funded coal-fired power projects under the BRI, with projects under construction that are mainly located in Indonesia and Vietnam (Peng et al. 2017). Building a coal-fired plant might benefit the economy and increase energy accessibility in the short-term, but it will lock a country into a high-emissions energy pathway, with subsequent economic implications as the cost of renewable energy continues to become more competitive and the costs of emitting carbon – to the economy, health and environment – grow (Altenburg and Rodrik 2017).

Most BRI-supported hydropower dams will be built in the Mekong region. In Laos and Cambodia, China so far has developed more than 20 dams, and most of them have been considered as contributions to the BRI vision (Eyler 2018). Despite their apparent short-term low emissions, hydropower dams

also come with a number of risks associated with climate vulnerability and potential damages to local communities and ecosystems including longer-term methane emissions (Räsänen et al. 2018) and changes to water levels, sediment distribution, and fish populations (Piman and Shrestha 2017).

Mekong region countries have acknowledged the negative trade-offs of dam construction. In February of 2018, the Mekong River Commission's seven-year Council Study showed that planned construction of 11 large hydropower dams on the Mekong river's lower mainstream and 120 dams on tributary rivers were a serious threat to the region's ecological health and economic vitality (Pianporn 2018). In addition, in July of 2018 the collapse of the Xepian-Xe Nam dam in Laos killed at least 34 in Laos and displaced thousands of Lao and Cambodian people. In August of that year, a breach of a dam in Myanmar's central Bago region killed at least four and flooded 85 villages. The collapse of dams has raised urgent concerns around dam quality and has highlighted the cross-border risks and trade-offs associated with developing hydropower dams in the Mekong river system (Boyland and Tukhanen 2018).

Also, some oil and gas pipelines were constructed under the auspices of the BRI, including the China-Myanmar Crude Oil Pipeline Project and the China-Myanmar Gas Pipeline Project. Large investments in pipeline infrastructure intend to increase the availability of fossil fuel, further locking recipient countries into fossil-fuel dependent economies and high greenhouse gas emissions (Ascensão et al. 2018). Indeed, the International Energy Agency estimates that continuing on a fossil-fuel intensive energy pathway will lead energy-related CO_2 emissions in Southeast Asia to more than double by 2040 (IEA 2017).

Overall, there is considerable uncertainty around how BRI infrastructure will affect climate change, society and the environment. To make the BRI in Southeast Asia sustainable and to minimize its contribution to the threat of climate change, recipient countries need to develop a coordinated policy that reconciles economic prosperity, social equity and environmental protection with the actions required to address climate change. Countries should be asking what other alternatives – such as nature-based solutions – could BRI investments support beyond these centralized options.

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3. A participatory approach to mapping potential climate and development impacts

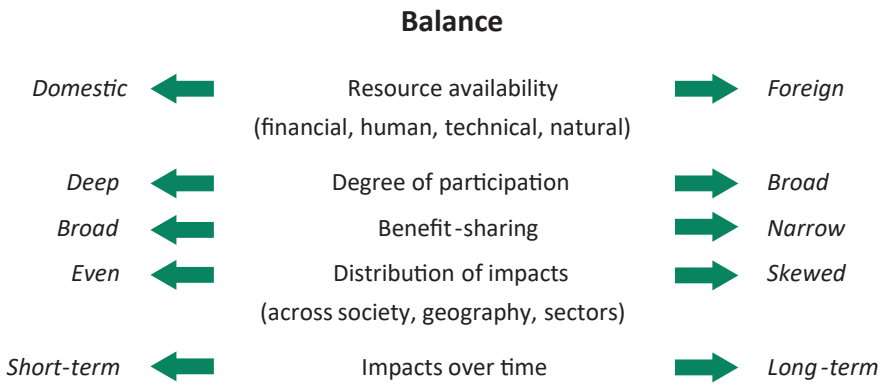
Investment decisions related to BRI projects may differ greatly depending on, amongst other things, the location and type of each project, the local business environment and the composition of investors. In order to open up to more diverse infrastructure investments, it is necessary to open up dialogue – within the BRI and within national governments – on what is socially and environmentally, as well as economically, appropriate for any given context. Decisions still need to be made and profitable projects still need to be developed, but that does not preclude an honest and open discussion on what future to pursue. Indeed, how the trade-offs associated with different infrastructure options are assessed can be just as important as the act of assessing them. For example, how are options and consequences compared, and who is involved in making the comparison? To ensure that policy is coordinated, meets national goals and suits local contexts the decision-making process needs to involve a broad array of expert and non-expert stakeholders representing different groups in society. Therefore, we call for the decision-making processes around BRI investments to embrace three characteristics: transparency, participation and commitment to international standards.

Transparency in decision-making

Infrastructure development is an inherently political process, with decisions requiring the careful balance of myriad needs and priorities. For example, hydropower has to balance increasing electricity supply for, among others, industrial development, low-carbon development, local community benefits, resettlement needs and maintaining essential ecosystem services. The Mekong River Commission's recent Council Study has clearly pointed out the potential negative impacts of continued dam infrastructure development on ecological health and local communities in the lower Mekong region (Mekong River Commission 2018). Impacts also differ across geographic scales (local, national, regional) and timescales (short-term to longer-term), with benefits often accruing to local elites or distant individual and corporate interests, while poorer constituencies nearby receive

few benefits and often bear the brunt of negative impacts (Matthews and Motta 2015; Smits 2012). Transparency involves openly acknowledging trade-offs between different priorities, clarifying how they are being considered and compared, and by whom. Figure 2 highlights how priorities must be balanced within possible issue areas. Tools for looking at policy coherence and trade-offs, such as the SDG interaction tool developed by Nilsson et al. (2016), offer an important way to identify the major trade-offs that will require particular attention in negotiated decision-making processes around infrastructure development.

Figure 2. Balancing trade-offs



Participatory process

Participation of experts and non-experts from local, national and regional levels in an open dialogue around the BRI infrastructure investment can help to bring greater transparency and wider perspectives to better decide which trade-offs to consider and how to compare them. Also, through the participatory process, local information and knowledge can be communicated from local stakeholders to national and regional levels, so the decisions taken can acquire social acceptance, or buy-in, and decrease risks of conflict (Lauber and Knut 2000; Pahl-Wostl 2002). Participation is a necessary, but insufficient, condition for open and transparent decision-making. Any participatory process can be captured by a few powerful individuals and used as a 'technology of legitimation' (Harrison and Mort 1998). For example, Middleton and Dore (2015) show that when participatory processes around hydropower development in Southeast Asia are pursued, they are typically constrained by significant power asymmetries among the people involved. However, several challenges will be faced during the process that need to be balanced, including representation of participants, asymmetric knowledge gaps between experts and non-experts and legitimacy of the process (Johnson and Karlberg 2017). Figure 3 provides an example of how a participatory process may unfold, particularly with regards to the identification of options and consequnces related to potential BRI investments.

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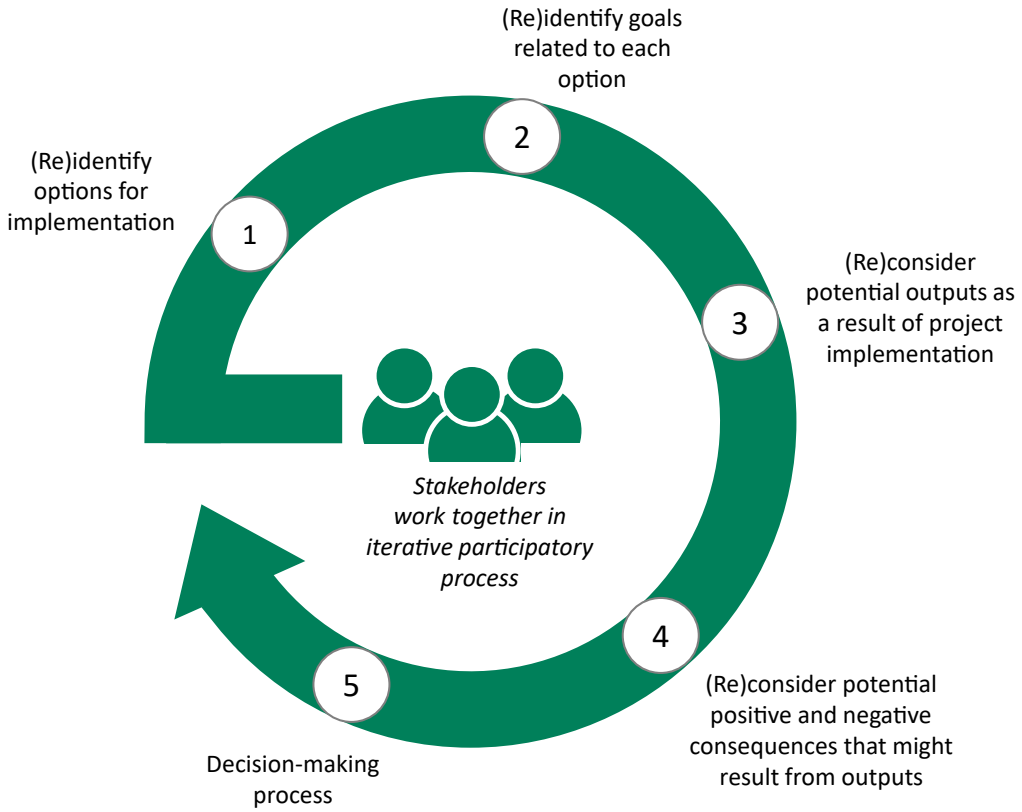
Commitment to international standards

Finally, during participatory processes, it is critical to have clear guidelines and principles to follow that help to manage trade-offs effectively. China has already committed to develop BRI projects under its national and regional standards. We propose further commitment to international standards that would align BRI investments in the Southeast Asia region – and beyond – with the highest level of globally acceptable standards for infrastructure projects. These international standards, such as those shown in Table 1, can help to guide participation and transparency in the management of outcomes. For example, the Equator Principles present a well-recognized global framework that provides risk management guidelines on how to assess and manage environmental and social risk in projects intended to establish a minimum standard for due diligence. Through participatory consultations and commitment to international standards the projects can have a more rigorous and transparent environmental and social assessment process and increase the chances of avoiding negative consequences in the region.

Figure 3. Participatory mapping of options and consequences



Source: Adapted from Janetos et al. (2012) and Johnson and Karlberg (2017)

Table 1. International commitments to sustainable finance practices

UNEP Statement of Commitment by Financial Institutions on Sustainable Development

We members of the Financial Services Sector recognize that economic development needs to be compatible with human welfare and a healthy environment. To ignore this is to risk increasing social, environmental and financial costs. We further recognize that sustainable development is the collective responsibility of governments, businesses and individuals. We are committed to working collectively toward common sustainability goals.

Six Principles for Responsible Investment (PRI)

Principle 1: We will incorporate environmental, social and corporate governance (ESG) issues into investment analysis and decision-making processes.

Principle 2: We will be active owners and incorporate ESG issues into our ownership policies and practices.

Principle 3: We will seek appropriate disclosure on ESG issues by the entities in which we invest.

Principle 4: We will promote acceptance and implementation of the Principles within the investment industry.

Principle 5: We will work together to enhance our effectiveness in implementing the Principles.

Principle 6: We will each report on our activities and progress towards implementing the Principles.

UNEP FI Principles for Sustainable Insurance

Principle 1: We will embed in our decision-making environmental, social and governance issues relevant to our insurance business

Principle 2: We will work together with our clients and business partners to raise awareness of environmental, social and governance issues, manage risk and develop solutions.

Principle 3: We will work together with governments, regulators and other key stakeholders to promote widespread action across society on environmental, social and governance issues

Principle 4: We will demonstrate accountability and transparency in regularly

disclosing publicly our progress in implementing the Principles

Equator Principles

We recognise the importance of climate change, biodiversity, and human rights, and believe negative impacts on project-affected ecosystems, communities, and the climate should be avoided where possible. If these impacts are unavoidable they should be minimised, mitigated, and/or offset.

UN Sustainable Stock Exchanges Initiative

We voluntarily commit, through dialogue with investors, companies and regulators, to promoting long term sustainable investment and improved environmental, social and corporate governance disclosure and performance among companies listed on our exchange.

Source: Based on a compilation from Volz (2016)

Conclusion

China's Belt and Road Initiative promises considerable infrastructure investment in Southeast Asia. Already a host of projects have been established under the rubric of the BRI, with many more in the pipeline. While this may offer many economic benefits to China and Southeast Asian countries, these benefits may not be equally distributed and there may be significant negative consequences for society and the environment. This challenge is particularly evident in energy infrastructure, where negative consequences accrue in areas close to large infrastructure sites, such as hydropower dams and coal-fired power plants, while positive consequences accrue further away in major urban centres.

The Chinese government has acknowledged the need to mitigate against such negative climate, environmental and social consequences of BRI projects. We propose a participatory framework for the use of BRI investors, national recipient governments and civil society to ensure that positive and negative consequences of potential infrastructure projects are understood early in the process. Input from diverse perspectives – particularly marginalized groups who often have little influence over infrastructure development in their communities – can enable a final design that has social acceptance from stakeholders and promotes nature-based solutions to address environmental challenges. Our framework focuses on pursuit of transparent and participatory decision-making processes to reconcile local perspectives with national goals and aligning with international standards and best practices.

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Stockholm Environment Institute is an international non-profit research and policy organisation that tackles environment and development challenges.

We connect science and decision-making to develop solutions for a sustainable future for all.

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Our work spans climate, water, air, and land-use issues, and integrates evidence and perspectives on governance, the economy, gender and human health.

Across our eight centres in Europe, Asia, Africa and the Americas, we engage with policy processes, development action and business practice throughout the world.