



Net-zero transitions for all? Considering applications in Asia

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Published online: 29 August 2023

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Introduction

In July 2023, this year, there have been everyday news repeatedly announcing the planet reached the highest recorded temperature day after day; then, it became the hottest month on record. The United Nations declared that our planet was witnessing ‘global boiling’. Global temperature increase has already reached 1.2 °C above pre-industrial levels according to the Intergovernmental Panel on Climate Change (IPCC 2018). It is no longer surprising to face each year increasingly severe heatwaves, unprecedented massive flooding, threatening wildfires, and other significant natural disasters and plenty more intense risks that expose our collective vulnerability to climate change.

Unfortunately, those most adversely affected by the negative impacts of the climate crisis tend to be marginalised groups of people who contributed the least to climate change (Lee and Zusman 2019; Lee 2021; O’Brien and Leichenko 2000; Parks and Roberts 2006), while continued industrial development has provided a high standard of economic well-being for the rich, both in the Global North and South. It is undeniable that unhinged patterns of development seen in the world’s industrialised and advanced economies are primarily responsible for the current climate crisis. The Emissions Gap Report (Oxfam and SEI 2020; UNEP 2020) noted the strong correlation between income and emissions, with the highest-income earners being the highest emitter, thus explaining the carbon footprint disparity, where the top 1% of the global ‘rich’ emit double the emissions of those in the bottom 50%.

Since the IPCC’s (2018) report suggests global greenhouse gas (GHG) net emissions to be zero by 2050 to stay below 2° warming, as of July 2023 (Climate Watch 2023), 96 countries along with numerous cities and companies (WRI 2023) have set their targets for net-zero emissions to minimise climate impacts, in alignment with the Paris Agreement at COP21 in 2015. The agreement, for the first time, highlighted the social costs of energy development including the differentiated economic consequences of the net-zero transition (Newell and Mulvaney 2013; Heffron and McCauley 2017). This landmark attention to the need for a just and sustainable transition has pushed the global community to think and strategize on ways to address pressing climate challenges in ways that are socially inclusive, equitable, and fair.

However, it has been particularly difficult to incorporate concepts of inclusiveness and justice into net-zero development (IISD 2021) due to the ambiguity concerning the idea of just transitions (Lee et al. 2023). The term, just transition, emerged from trade union movements in industrialised countries, starting in the U.S., to secure and create decent and quality work (Henry et al. 2020). In the last decade, just transition discussions have expanded to include other perspectives that have extended their meaning and applicability beyond unions, workers, and jobs (Snell 2018; Kreinin 2020; WRI 2023). From a long-term perspective, having diversified interpretations considering how transitions come about, such as, for whom justice is intended, how they are involved, and what policies are to be supported, could deliver substantial and positive transformation on the ground. As climate change creates impacts on intersectional segments of society with diverse impacts across and within regions (Harcourt and Nelson 2015; Gore and Alestig 2020), the interpretations of just transitions necessitate sensitivity to local contexts across space and time.

Given that many Asian countries have pledged net-zero targets with an obvious need for rapid transition, the concept of just transition to promote sustainability and resilience,

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however, has yet to receive wide policy attention and lack of relevant research guiding just and sustainable society in net-zero Asia. Just transition can be a particularly powerful framework for the Asian policymakers for it can guide better alignment between pressing development priorities and local and national clean energy imperatives. In the absence of this way of thinking, combined with the rush to transition, there is a potential threat whereby Asian governments may resort to adopting dominant Western ideas of ‘growth’, mimicking a technocratic approach to innovation and transition pathways that respond to market-based economic needs (Lee et al. 2023). In light of the high degree of heterogeneity within Asia, the idea of just transition should be framed with local nuances that are context-specific and are shaped by socio-cultural, environmental, and institutional diversity.

This special feature on “Just and Sustainable Transitions in Net-Zero Asia” aims to highlight how researchers, policymakers, and practitioners across Asia are applying just transitions thinking to address pressing environmental challenges, climate injustices, and social inequities. The underlying argument across all contributions to this special feature is to explore how the Asian regions can achieve climate ambitions in ways that minimise harm and injustices. It asks how inclusive and just sustainability pathways may foster a resilient society in this critical world region and avoid recurrent climate injustices that threaten to leave the currently disadvantaged even further behind. These Asia-specific research studies present a variety of settings within which the application of just transition principles is tried and tested. Covering applications across coal phase-out, agriculture, food, wetlands, and youth activism among others, these cases from across Asia reiterate caution against a one-size-fits-all approach to designing pathways for inclusive and just transitions in the region.

Just transitions: applicability in Asia

As the dominant economic development path is often largely propelled by the fossil fuel industry in advanced economies, just transition should be understood in full consideration of this feature. To be relevant to the Asian context, the concept of just transition should consider local development challenges, reflect domestic circumstances, and respect indigenous cultural knowledge and experience rather than simply adopt the pathways under the existing economic development paradigm that possibly regenerate similar patterns of exploitation.

Pre-existing inequalities could recur under net-zero development with similar narratives especially when only technological transition receives the most attention in this region. The Net-Zero Roadmap from the International Energy Agency (IEA 2021) which requires the urgent

and massive deployment of clean and efficient energy technologies has been adopted as a positive step considering the climate crisis and its negative impacts on both human society and the environment. Nonetheless, technological transitions alone have insufficient capacity to fight against all the climate-related challenges, because any major reduction in global emissions is entangled in economics, politics, culture, geography, and knowledge, rather than being a simple issue achieved through technical improvements (Sovacool et al. 2019; Geels et al. 2016; Creutzig et al. 2018; IPCC 2018).

The trade-offs associated with the development of massive renewables for rapid decarbonisation have already replicated pre-existing injustices as addressed by authors of this special feature, including issues of fishing rights and land grabbing from the massive commercial solar complex in Taiwan (Walther and Chou 2023) as well as other cases that resulted in locals’ loss of livelihoods and right to access resources due to biofuel production, wind energy, hydropower, and many more (Backhouse et al. 2021; Del Bene et al. 2018; Dunlap and Arce 2021; Global Energy News 2015; Goodman et al. 2019). Furthermore, massive demands to produce solar PVs also continued previously unsolved justice issues as the PV technologies are very much dependent on semiconductor manufacturing—the industrial sector known for increased occupational safety and health risks, especially among female workers (Pellow and Park 2002; Silicon Valley Toxics Coalition 2009).

Current just transitions

Climate-driven justice has thus emerged as a significant environmental, economic, and social concern associated with a net-zero transition that requires domestic environmental policies of countries in Asia to be more sustainable and socially just. China, in its Five-Year Plan for 2035, suggests “an intent to operationalize key values underlying a Chinese ‘just transition’ that integrates social cohesion, rural–urban revitalisation and ecological civilization” (Sharma et al. 2023) and also pledged its net-zero target by 2060. Vigya Sharma et al. (2023) consider that China might face enormous pressure to maintain its energy security while phasing down coal use to meet the target as it occupies half of the global coal production and coal-fired electricity. In “How do past global experiences of coal phase-out inform China’s domestic approach to a just transition?” in this special feature, Sharma et al. (2023) review the successful and also failed lessons of coal phase-outs in Western countries with decades of experience and attempt to address insights into China to achieve its climate commitments. For China, a big and heterogenous nation with a unique political economy structure, they identify relevant suggestions that provide useful pointers for energy

polymaking including: an inclusive and dialogue-oriented engagement for fairer processes and outcomes, a holistic perspective for longer term transformation and an implant of just transition in development policies for greater policy ownership.

While Sharma et al. (2023) seek the ideal development policy priorities that embed just transitions towards net-zero China, Fang Yang et al. (2023) examine the on-the-ground experiences of the deployment of rooftop photovoltaics (PVs) in rural households in China through the energy justice perspective. Since the Chinese government has been active to promote rooftop PVs to achieve low-carbon transitions, the local governments tend to take the authority to initiate and maintain the household adaptation of PVs following the special political and social management system in China, and that results in the unfair experience of the early adopters of household PV systems in Yang et al.'s research entitled “Household adoption modes of rooftop PV in rural China and social inequality: an energy justice perspective” (2023). The findings argue that the massive promotion of rooftop PV deployment happened when the local governments occupied to manage the structural opportunities for the households to adopt it through welfare distribution mode or collective leasing mode. At the same time, however, this type of top-down local governments approach reduced the transparency of the decision-making process and opportunities for residents to participate in a community energy plan. Yang et al. (2023) find that the demerits of the current energy policy are a strong emphasis on monetary incentives and government subsidies that merely increase energy over-consumption rather than support the most vulnerable groups of people in the communities.

Following the concerns raised in the previous papers about the unique and strong government-led energy transitions in China, Walther and Chou (2023) brought attention to the recent workers' protest brought on by the air quality policy—a rare case as anti-communist political repression limits the actions of the labour movement in Taiwan. The dominant discussion on the transition to net-zero society mainly addresses that of the energy system from fossil fuel to renewables, yet Taiwan had no coal mining-related industry at the time of agreeing to set a net-zero target by 2050. Taking this dissimilar occasion with other regions, Walther and Chou (2023) highlight the labour protest happening, the same year as the Yellow Vests movement, in the heavy-duty diesel vehicle industry in Taiwan to defend the workers' rights against air quality regulations and policies. In “Just Transition on air quality governance: a case study of heavy-duty diesel truck protests in Taiwan”, Walther and Chou (2023) explain a heavy reliance on private trust in Taiwan's transportation industry due to the special social backdrop—limited forces of leftist and trade unions—that produced widespread license-leasing

labour relations. They also point out this incomplete but common labour-capital system deserves a special attention as it is the critical social contextual factor in a just transition discussion in many other Asian regions.

Just transitions in other areas: agriculture

Drawing on the research in just and sustainable net-zero transitions in Asia, some of the authors of this special feature look specifically at the broader interpretations of a just transition approach from the energy sector to the food system. **Not only because many areas in Asia still depend on agricultural lifestyles but also given evidence that over 30% of world GHG emissions are produced from agri-food related processes such as agricultural land, and pre- and post-production activities of food supply chains (FAO 2021; Tubiello et al. 2021)**; it proves that the current food production and consumption is based on the prioritisation of industrial agriculture that frequently disregards the safety of the surrounding ecosystem with heavy inputs of agrochemicals and high energy dependency.

The review of the new agricultural system is conducted by Md Nazirul Islam Sarker et al. (2023) in “Promoting net-zero economy through climate-smart agriculture: Transition towards sustainability”. They introduce the concept of climate-smart agriculture as the way to transform the food system from industrial agricultural practices to sustainable management approaches including agroecology and agroforestry ensuring a sufficient agri-food supply with minimum GHG emissions as well as a net-zero economy to reduce poverty issues in rural areas. The idea of an agricultural just transition as they described calls for greater attention to how the transition should be implemented to create climate solutions for communities, and suggests promoting an inclusive and participatory process throughout the food supply chain. To meet the needs of affected communities under the climate crisis, they map the diverse stakeholders including proactive government participation with other policies and services.

From the demand side of the food system, there also has been a broad interest that current food systems require a just transition process to achieve more sustainable and inclusive food production, distribution, and consumption. Watabe (2023) provides reasons to insist on the need for a just food transition; for example, the climate impacts on food security caused low-income populations to suffer the most, and, a different modality with a similar narrative, that which was produced as climate-friendly food created unfair opportunities to access. There also could be potential socio-cultural tensions due to the dietary shift under the net-zero target. In “Making Sense of (un)Sustainable Food: Creation of Sharable Narratives in Citizen-participated Farming”, Atsushi Watabe (2023), therefore, brings about the example

model of urban agriculture that has been promoted since the late twentieth century in Japan and traces the collaborative relationship among farmers, urban residents, and local governments working together to protect the multi-faceted values of food, environment, and society based on his participatory observations in the urban farming area. **One of the findings of this research is to take a deeper look into the re-evaluation of existing lifestyles and values to achieve just and sustainable food system transitions.**

Then, the next paper seeks to find a way to utilise rural areas to achieve decarbonisation by shortening the food mileage and reducing the carbon footprint. In “Assessment of alternative land resource utilisation towards net-zero and regional revitalisation through the circulating and ecological sphere (CES) in the depopulated city regions in Japan: A case study of Hachinohe city region”, Haruno Sato et al. (2023) articulate the concept of CES as a particularly relevant framework to depopulated areas across Japan where facing a continuous increase of underutilised agricultural land that brings environmental, social, and economic challenges. The idea of CES for self-reliance in local resources could produce multiple benefits according to their scenario analysis. The production of solar electricity from the underutilised land cover the full electricity consumption level in the region, decent job creation aligns with local government policy that encourages in-migrants, contribution to domestic food supply resiliency, and many more. Sato et al. (2023) acknowledge that the CES approach provides “a spatially just transition whereby new rural–urban linkages create synergetic processes towards a carbon–neutral society”.

Beyond intra-generational climate justice

The aforementioned papers included in this special feature offer an extended scope of just and sustainable transitions; however, there remain the arguments of the intra-generational conflicts. One of the outstanding characteristics that distinguishes the research of environmental justice from that of social conflicts is its interest in the interlinkages with other species (inter-species justice) and also with the next generation (intergenerational justice). The following two papers address the broadening and deepening understanding of just and sustainable transitions for all, including future generations and nonhuman nature.

Hiromi Yamashita’s (2023) overview article “Just transition through ‘commoning’ coastal wetlands in growing and shrinking communities in Japan” recalls the idea of inter-species justice between human society and nature. She criticises the way coastal wetlands have been destroyed through industrialisation and capitalist privatised management strategies. The article then utilises the current discussions on commoning resources and how the restoration

of the coastal wetlands could lead to just transition. The ideal set Yamashita (2023) suggests is the community ownership of commons for a regenerative economy. When commoning happens, it provides new opportunities for local communities to manage to live with their environment through self-governance to achieve a just transition for the sustainable future of their communities. She explores the interconnected relationship between locals and their social and environmental resources that exist locally. This overview paper taps into the concept of commoning as the forgotten solution to building a more sustainable, socially connected and resilient community.

Last but not least, this special feature collected a paper that demonstrates the empirical analysis of youth climate activism, entitled “Climate justice beyond intergenerational conflict: Youth climate activism in South Korea” by Kyu Youn Choi (2023). Beyond the standard argument of intergenerational climate conflicts between the current generation as the perpetrators accused of temporising on climate policies and the future generation as the victims of the climate crisis, she identifies Korean school strikers which are characterised by their ambivalent stance towards the term ‘future generations’. Korean youth climate activists focus on the need for solidarity among all marginalised segments of society to fight against the existing social injustice issues and argue that their climate actions work for the rights of all rather than merely the future generation’s interest. Choi (2023) argues that, using the impact of historical context, Korea’s history of poverty has neutralised criticisms of older generations, so that the rhetoric of intergenerational inequality less adequately fits the Korean case.

Way forward

This special feature has highlighted the wide appeal of a just transition-informed approach to long-term sustainability outcomes in Asia. Whether considering pathways for coal phase-out, examining workers’ rights against air quality policies, exploring participatory urban farming, land revitalisation in city regions or the deployment of solar PVs in rural areas, equity, fairness, and justice form a core thread running through the diversity of research presented here from across Asia.

A major finding of all contributions to this special feature is the need to understand that just transition strategies and their implementation in the Asian context deviate from where the concept originated. The environmental governance field has often been noted to put Western knowledge and practice as the basis for global solutions with insufficient consideration of local systems and cultural values (Escobar 2018; Biermann et al. 2022). Just transition thinking offers a strategic way to counter

this by fostering long-term actions and solutions that are sensitive to the historical, cultural, political, and societal differences between regions. Those tailored context-specific strategies would be worked out in meaningful consultation with diverse stakeholders to address issues of procedural and restorative justice. This would greatly complement policy work and identify red flags early to ensure that transition pathways are pragmatic, timely, and impactful (Bickerstaff et al. 2013; Schröder 2020).

Though this special feature attempts to provide cases and insights into the operationalisation of just net-zero transitions in policies and practices in the Asian region, there are issues that remain untouched and should further be addressed in future research. Most of the collections are dominated by the analysis from specific countries in East Asia but none in Central, South, or Southeast Asia. It is an important future study to work on ample cases in other parts of Asia and deepen both quantitative and qualitative analysis of non-Western, local, and historical contexts. Plus, it would be encouraged to expand a discussion of how to position the concept of just and sustainable transitions in the long-standing debate in the research community of sustainability and environmental justice.

In the post-Fukushima period, an independent renewable energy system run by locals on a voluntary basis in Fujino town, Japan became a well-known activity for possible decentralised energy transition. National and sub-national climate targets across Thailand are translated into local languages to the extent possible—rather than a mere adaptation of imported terminologies—and complemented with local knowledge and wisdom to allow communities to better comprehend the implications of these targets for them. As the only country to achieve net-zero so far, Bhutan's invention of the Gross National Happiness Index is a timely reminder that putting people and societies at the heart of the climate narrative can generate positive outcomes for generations to come. **Just transition is a helpful framework in this direction by allowing us to recalibrate how we understand and analyse both global and local energy and climate challenges over the next several decades.**

Acknowledgements Dr. Vigya Sharma and Prof. Deokhwa Hong provided helpful and valuable feedback to the earlier draft of this Editorial. The Lead-Editor gratefully acknowledge many reviewers who provided critique and comment of all papers in this special feature.

Funding The author received no financial support for the research, authorship, and/or publication of this article.

Declarations

Conflict of interest The author declares that there is no conflict of interest.

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