Just and Sustainable Transitions for a Net-Zero Asia: Emerging Issues and Solutions

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Key Messages

- The concept of a just transition is garnering attention in international policy processes yet is still not well defined.
- Much of the focus in defining and operationalising a just transition relates to early efforts aimed at reducing employment losses from structural changes in energy systems.
- Countries in Asia offer many lessons and experiences concerning social and environmental justice issues that are relevant to discussions on just transition; these lessons should be reflected in defining and operationalising a just transition. This is especially important because many countries in Asia are proposing ambitious net-zero targets.
- Asia's traditional values and views on the relationship between human and the environment can also provide important insights into the various ways that a just transition affects different groups, and how policies can be tailored to reduce the impact of socioeconomic changes on health and livelihoods.
- Many examples of solutions from Asia are not new, but require further advocacy and support to gain traction. This is particularly true for locally-driven initiatives that provide both environmental and social benefits.
- To improve prosperity of all and foster a truly just transition, policymakers should go beyond addressing the needs of those left behind and consider traditional Asian values related to sustainable and modest lifestyles.

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1. Introduction

It is well established that a majority of the world's advanced economies—along with high-income segments of developing countries—are primarily responsible for the current climate crisis, owing to their disproportionate consumption and overexploitation of planetary resources. The adverse impacts of the climate emergency such as extreme weather and natural disasters have become a significant driver of social inequality, especially among those with smaller carbon footprints, who increasingly bear the brunt of planetary crises (Lee and Zusman 2019; O'Brien and Leichenko 2000; Parks and Roberts 2006). The concept of climate justice has thus emerged as a key socioeconomic issue associated with a net-zero transition. However, the definition and scope of what constitutes climate justice—particularly how it relates to a just transition for all—remains contested. For instance, the European Union has already adopted a Just Transition Mechanism within its domestic borders that is limited to job creation at present.

The debate about just transitions is unique in that it considers a wide range of stakeholders, encompassing multiple views around how social equity relates to net-zero development[1]. For instance, multi-stakeholder technical working groups within the United Nations (UN) system have prepared a thematic report (UN 2021) outlining a global roadmap to achieve Sustainable Development Goal (SDG) 7 on affordable and clean energy by 2030, with a view towards achieving net-zero by 2050—the product of which was presented during the UN's High-level Dialogue on Energy in 2021. One of the technical working groups focusing on Enabling the SDGs through Just Energy Transitions conceded that there was difficulty in incorporating concepts of inclusiveness and justice into the proposed recommendations for the draft report (IISD 2021). Much of the cited challenges involve a lack of shared agreement on the definition, purpose, intended beneficiaries and others. This is despite the fact that there is wide-ranging consensus that inclusiveness and justice should be factored into net-zero development and associated policy and implementation processes.

[1] Since the Intergovernmental Panel on Climate Change (IPCC, 2018) made it clear that ambitious mitigation actions are crucial to limit warming to 1.5°C above pre-industrial levels, many countries and cities have pledged net-zero emission targets. For example, the European Union (EU) announced its Green Deal initiative in 2019 and China followed suit by committing to carbon neutrality by 2060; and the Leader Summit on Climate pushed major countries to commit to carbon neutrality by 2050. As of November 2021, more than 140 countries had committed to carbon neutrality targets. *Net Zero by 2050,* published by the International Energy Agency (IEA), emphasises the need for the "immediate and massive deployment of all available clean and efficient energy technologies" (2021: 14) along with the introduction of technologies to help transition from existing fossil-based to carbon free systems. Due to the emphasis on rapid technological changes in these pledges, there is a need for a concrete understanding of not only the targets but also the impacts of net-zero development on people that could be left behind.

The complexity of defining and operationalising a just transition has long been recognised. Part of the reason for this complexity is the required deep reductions in global emissions are complicated by economics, politics, culture, geography and knowledge—issues which cannot be resolved through technical improvements alone (Smith and Stirling 2010; Sovacool 2019; Geels et al. 2016; Creutzig et al. 2018; IPCC 2018). However, although the majority of countries in Asia have pledged net-zero targets, the concept of just transition has yet to receive full attention within the region. One potential consequence of the limited attention is that governments resort to adopting existing ideas to keep pace with the so-called "global standard," mimicking technological innovations and structuring transitions to respond to immediate needs. As the just transition debate still tends to be limited to job security, countries in Asia need a more balanced account of a just transition. Such a balanced account would correspond with the diverse models of development in the region, while fostering transformative change and climate justice over the long-term.

All these concerns have a bearing not only on domestic policymaking processes but international discussions where there is a need to more comprehensively understand these issues. To help policymakers envision what policies might be deployed to make a net-zero transition just, this paper will review concepts of environmental and climate justice, while also recognising that technological transitions have been unable to sufficiently address climate-related challenges. The paper then explores the applicability of the just transition concept in Asia, noting that structural conditions and societal challenges vary across countries in the region. In the final section, the paper will examine a diverse range of solutions centred on principles of inclusive, just and resilient societies in Asia, discussing opportunities for potential implementation through local and collective collaboration.

2. Just Transitions: Origins

In view of the growing climate emergency and its associated impacts on human society and the wider environment, a speedy transition from fossil fuels to renewables is essential. Nonetheless, it is also clear that such a transition may also have unintended and immediate economic impacts on local workers, many of whose livelihoods depend upon polluting industries such as fossil fuels. These pressures can compound other vulnerabilities facing workers and communities, including environmental degradation and social problems arising from the pursuit of unsustainable economic growth. For example, in Kentucky, U.S, a heavy reliance on coal production resulted in less investment and less industrial diversification comparable to non-coal dependent areas. Coal industry workers, in turn, received lower incomes than neighboring villages. Beyond these economic disadvantages, workers in surrounding communities suffered from health problems as a result of toxins released from coal dust and polluted water, as well as from labour safety violations associated with

extraction, processing and distribution of mining products. Similar cases can be found in many other regions following comparable industrial paths (Perry 1982; Cha 2019).

Considering these issues, there have long been social and environmental movements mobilised under the banner of "environmental justice" driven by the credo of overcoming inequalities and addressing disparities (Walker 2009; Schlosberg 2013; Sikor and Newell 2014; Martinex-Alier et al. 2016; Holifield et al. 2018; Temper 2018). Since the 1990s, as environmental externalities associated with fossil fuels, including climate change, have become increasingly apparent, the concept of "climate justice" emerged to address the disproportionate impacts of climate change on marginalised groups and communities, who had made no or little contributions to greenhouse gas emissions (GHGs) (Meikle et al. 2016; Jafry 2019). Climate justice considers issues beyond technical measures required for reducing GHGs; it also necessitates addressing underlying issues of injustice in parallel to environmental inequality.

While "climate justice" places its emphasis on addressing root causes of climate crisis and distributional inequality of climate impacts, "energy justice" calls attention to the need for an equitable supply of affordable and sustainable energy for all (McCauley et al. 2016; 2019). The concept of energy justice traces back decades, first emerging in the 1980s (Perez-Guerrero 1982; Weinberg 1985); the recent concept of net-zero transition has revived thoughts around how energy pathways need to be pursued in a more inclusive and sustainable manner. The concept of just transition, therefore, addresses both environmental and social implications of energy development, including potential disproportionate economic consequences stemming from a transition to a net-zero future (Newell and Mulvaney 2013; Heffron and McCauley 2017).

Initially conceived in the 1970s, the concept of just transition originated in the U.S. labour movement at a time when environmental issues where still considered peripheral in discussions around social justice. Led by trade unions including the Oil, Chemical, and Atomic Workers (OCAW) in the 1990s, the concept first arose as a response to more stringent environmental regulations set out under the U.S. Superfund Act, which resulted in employment losses within certain areas targeted for environmental remediation (Bazilian and Markuson 2020). Since that time, a just transition has gained traction at the international level, endorsed by multilateral institutions such as the International Labour Organization (ILO), UN Environment Programme (UNEP), Organisation for Economic Co-operation and Development (OECD) and the UN Framework Convention on Climate Change (UNFCCC), among others (Galgóczi, 2018), and the concept has been spread to and widely adopted beyond unions and workers (Snell 2018; Kreinin 2020). As both the ILO (2015) in its guidelines for a just transition and Trade Union Development Cooperation Network's report (2019) emphasised the important role of governments for the integration of just transition in policies, an immediate action to promote just transition would be for national governments to intervene in the economic sector by creating green jobs or providing welfare and compensations for those directly impacted by a net-zero transition.

From a long-term perspective, however, more diversified approaches should be considered regarding to whom is being treated unjustly, how they are involved, and what institutions and policies are needed given that the climate crisis has impacted intersectional segments of society, ranging from class, race, gender as well as different countries and regions (Harcourt and Nelson 2015; Gore and Alestig 2020; Hickel 2020). Understood in this context, the basic goal of just transition should not be limited to providing solutions only for workers and fossil fuel communities, but be more widely applied to support a net-zero future for all. The concept of just transition therefore needs to broaden its scope to account for inequalities resulting from the shift towards net-zero while also addressing the marginalisation and dispossession of key social groups. Otherwise, new job opportunities could be regarded only as the instant proxy for transitions and fossil fuel dependent communities might resist a rapid shift as exemplified by coal dependent areas in the U.S (Saha and Muro 2016). By this reading, a just transition is consistent with but extends beyond ensuring decent jobs for workers. It also requires building resilient and sustainable livelihoods for communities, and equal societies for citizens.

3. Net-Zero, a Positive Target for All? Applicability in Asia

The just transition approach originated from efforts to advance labour rights of workers directly affected by a low carbon transition: it thereafter expanded to also encompass livelihoods and health concerns of workers and communities located in close vicinity to extractive industries. As prevailing macroeconomic development strategies are often largely propelled by the fossil fuel industry, especially in advanced economies, the concept of just transition should be contextualised appropriately. However, in order for it to be relevant to countries in Asia, a just transition definitions should also seek to avoid generalising about stages of economic development, as starting conditions and socioeconomic challenges differ across regions and countries.

This section seeks to explore specific applications of the just transition concept, making use of a critical justice lens. In so doing, the section elaborates on general frameworks concerning environmental injustice narratives, including how impacts vary across different groups (distributional justice), how those groups and communities are included in the process of planning and decision-making (procedural justice), and how specific interests of various actors have been marginalised (cognitive justice) (Fraser 1998; Menton et al. 2020)[2]. An example from Indonesia illustrates this point. The economy of Indonesia has been described as a hybrid form of capitalism "characterised by a combination of market-based policies and institutions, direct forms of state intervention, and coordination based on the predatory interests of powerful politico-business families" (Rosser 2014: 79 in

[2] This intragenerational injustice dimension covers not only unequal distribution of environmental impacts between different class, race, gender etc within a specific country or society but also between regions, namely "environmental colonialism" (Agarwal and Narain, 1991).

Fünfgeld 2019: 227). This characterisation is not unique to Indonesia or other countries in Asia—the existence of patronage networks between business actors, politicians and elites is well documented, many of whom are directly or indirectly associated with domestic coal industries (Toumbourou, et al. 2020).

Understood from the perspective of procedural injustice, these actors position coal as a primary energy source from which they seek to benefit, excluding local communities in the process. By way of example, the East Kalimantan government of Indonesia adopted provincial regulations strengthening oversight over coal mining and clean-up operations in 2013, the end result of a long-fought activist campaign. While this case is notable in that it was the first instance of a successful locally driven, worker-led movement against coal in Indonesia, farm and fishing communities residing near major mines and power plants continue to face severe impacts on their health and livelihoods from environmental degradation, as well as restricted access to land and coastal areas (Toumbourou et al. 2020).

Moreover, these distributive and procedural inequalities tend to be obscured by the shadow of overall economic growth. Indeed, the environmental and social impacts of coal production on Javanese fisherfolk residing close to the coal-power stations remain unaddressed. This is largely because local residents were not fully informed about the construction of the power plant and its potential side-effects from the start, and had no legitimate channels through which to appeal and make their voices heard. As a consequence, a number of protests took place, with demonstrators demanding the right to access relevant information about planned construction; Indonesian media televised this as a challenge to the economic *status quo*. Similarly, even when these local communities finally received official recognition for their grievances, they discovered that compensation provided to local fisherfolk, was distributed unequally i.e. benefits were only for the boat's owners but not shore fishers. Subsequently, a number of local villagers in Java made clear their preference to maintain their traditional lifestyle and culture—in this case, fishing and salt-making—than to receive instant monetary compensation.

Such structural injustices may potentially also arise in the push to achieve net-zero targets, but in different modalities with similar narratives. Many Asian countries, for example, have faced severe air pollution due to rapid urbanisation and economic development, which have had disproportionate effects on health and income of urban residents. In this connection, the case from Hebei province of China presented below documents potentially negative side-effects associated with a just transition approach.

Justice Considerations during Industrial Restructuring in Hebei, China

Hebei Province, surrounding Beijing municipality, is a major steel manufacturing industrial area where thousands of small factories were once located. In order to protect Beijing's urban population from intense air pollution emitted from industrial processes during the winter, the Chinese government issued an order to

suspend regular manufacturing operations, which resulted in a number of factory closures. Doing so led to mass unemployment, with job losses estimated as high as one million in Hebei alone. Many of the immediate employment opportunities that came about after this restructuring were for low-skilled, non-decent jobs. Ultimately, a large percentage of workers were directly affected by toxic air pollutants, and then laid-off or reassigned to lower tier jobs as part of the government efforts to reduce air pollution. The Hebei government has since issued a range of social and financial support measures, but they are still limited. In sum, although the top-down enforcement of environmental policies could easily be adapted to facilitate a net-zero transition, doing so also could burden different social groups unless appropriate countermeasures are implemented in parallel. (Source: Schröder 2020)

As the Hebei case illustrates, certain development pathways set out within the existing economic paradigm may potentially replicate patterns of exploitation by worsening already-existing inequalities.

Nevertheless, it is important to recognise certain caveats concerning promotion of the SDGs—particularly SDG 7, focused on advancing the uptake of renewables and green technologies—in relation to a just transition. For instance, in some cases the installation of large-scale wind farms and solar parks may lead to a range of negative social and environmental consequences (Scheidel and Sorman 2012). In India, for example, a speculative financial bubble fuelled by the solar industry has given rise to serious concerns. As a case in point, approximately 20 billion USD investment for domestic manufacturing of solar was announced in 2015 by an international private financing consortium made up of Japanese and Taiwanese companies. This large-scale renewable project has contributed to a number of environmental and social challenges, including accusations of land grabbing, after the massive solar complex was commissioned land by local authorities in Gujarat, India. In order to facilitate rapid decarbonization, the development of similar renewable complexes such as wind energy (Dunlap and Arce 2021), biomass for biofuel production (Bastos-Lima and Gupta 2014; Backhouse et al. 2021), hydropower (Del Bene et al. 2018) are commendable. Yet, if key issues remain unresolved, doing may also exacerbate social tensions and distributional inequities, especially where local residents are not sufficiently consulted (Global Energy News 2015; Goodman et al. 2019). Notably, some communities facing pressures to those similar to Gujurat have encountered oppression, dispossession, loss of livelihoods and access rights, institutional violence, and, in extreme cases, abduction and disappearance of activists (Butt et al. 2019; Menton and Le Billon 2021 Ramcilovic-Suominen 2021). Taken together, Dudine and Szoke-Burke (2020) emphasise that principles of Free, Prior and Informed Consent (FPIC) need to be upheld at all stages of investment approval for agricultural, forestry, and renewable energy projects.

Seen from another angle, certain innovations may support the development and expansion of low-carbon technologies, while at the same time contributing to ethical concerns as well as environmental and social risks (Biermann et al. 2022, Bentz et al. 2022) ultimately leading to violations of justice (Zehner 2012) that threaten

delivery of the SDGs. To produce batteries for EVs and wind turbines, for instance, rare earth elements (REE) are indispensable. REEs are mostly imported from China. As the demand of REEs sharply increased, a Mojave Desert mine in China that was closed due to environmental considerations had to be reopened (Newell and Mulvaney 2013). Massive global demand for solar PVs resulted in human rights transgressions in certain instances, given that PV technologies are very much dependent on semiconductor manufacturing. Since the 1970s, a number of environmental litigations have been documented in the PV sector resulting from the use of toxic chemicals, which have increased occupational safety and health risks, especially among female workers (Pellow and Park 2002; Silicon Valley Toxics Coalition 2009). As countries in Asia move to progressively ramp up their net-zero commitments, scaling up the utilisation and deployment of PVs these health hazards stand to be perpetuated, unless corrective actions are taken.

4. Diverse Solutions Towards Just Societies

As outlined above, in order to facilitate a transition to net-zero, policies are needed not only to speed up the deployment of green technologies and expansion of new infrastructure, but also to address potentially negative environmental and social impacts on the workforce and local communities. In this regard, carefully crafted policies that ensure the provision of unemployment benefits, pensions, and re-skilling of affected workers are considered essential (Olsen 2009; Newell and Mulvaney 2013). However, the recurrence of certain environmental and social injustices underlines the significant role that fair and inclusive participation also play a role in guiding a just transition. As Schröder (2020:11) correctly points out, "ill-conceived transitions implemented without social acceptance can be costly and create unexpected delays". The case of Germany below illustrates how efforts to enable a just transition for local workers may take as long as a decade of planning to direct its gradual implementation.

Germany's Successful Decade-Long Transition Out of Coal

Several decades of planning and programmes led the Ruhr area in Germany to graduate from a mining-dependent to a more diversified economy. The German Federal Government credits this transformation to a managed and just transition conducted in close consultation between workers, communities, and labour unions. In 2007, negotiations started between the Federal Government, states of North Rhine Westphalia and Saarland, RAG Corporation and workers of the Mining, Chemical and Energy Industrial Union on the identification of options for a socially acceptable transition away from coal mining. A deadline was set for 2018, at which time the national government planned to terminate subsidies it had long provided to the mining sector. Together these stakeholder groups adopted a cooperative approach to devise solutions aimed at generating new employment opportunities. This included the establishment of the RAG Foundation, an

institution tasked with supporting the delivery of qualification trainings and reskilling programmes while also financing ongoing mining operations. The Foundation also sought to further advance educational, scientific and cultural projects across the Ruhr and Saar regions. Taken together, the inclusive and participatory collaboration among key stakeholders effectively contributed to careful planning and long-term goals, thereby enabling workers to find new opportunities in remaining mines, while also extending financial support for retraining and early retirement schemes. (Source: ACTU 2016)

Accordingly, climate change solutions should be structured in a socially just and ecologically sound manner. This is especially relevant to concepts of "energy democracy" and "energy citizenship", which are emerging and gaining traction across multiple countries. Indeed, a number of governments are placing a growing emphasis on expanding citizen ownership of energy supplies. For instance, various renewable energy technologies have the potential to be more widely decentralised along with sustainable enterprises that could manage these technologies within local communities (Reyes 2015; Healy and Barry 2017). There are already countless lessons from countries where centralised large-scale electricity systems have led to problems, and which, in turn, have adopted wider energy democracy. The most popular energy cooperatives include, for instance, 'cooperative purchasing' or 'community choice aggregation' in the U.S., 'remunicipalisation' of energy distribution models in Germany, as well as the establishment of more than 200 municipal energy companies in the U.K., where power has been shifted to public energy supplies in place of private corporatisation (Heinrich Böll Foundation 2018).

Transition strategies for countries in Asia, however, may diverge from those in the West, especially as high-carbon dependent models have contributed to a range of negative environmental and social impacts. To seek appropriate solutions to achieve sustainable futures in Asia, the cosmopolitan theory of justice (Caney 2005) along with classic frameworks such as distributive, procedural, and recognition justice may be useful. The cases provided in the next section will elaborate on these concepts further, seeking to avoid the tendency in research to position Western knowledge and practice as the basis for global environmental policy and solutions while ignoring local systems and cultural values (Escobar 2018; Biermann 2020). As Dengler and Seebacher (2019: 249) suggest, Western knowledge and practice may be better framed as supplemental ideas and movements rather than a blueprint "proposed by the Global North and imposed on the Global South". In other words, to transform hegemonic models, resource-intensive development paradigms, and unsustainable consumption and production patterns of society towards just and sustainable net-zero future, Asia should lead and generate solutions tailored to its national and local circumstances, rather than continue to emulate carbon dependent development models from abroad. Doing so recognises that these models are cause and consequence of the climate crisis with associated societal inequalities extending across the local and global scales.

5. Forgotten Solutions from Asia

While international climate negotiations have started to take stock of the necessary elements for enabling a rapid net-zero transition, there are still questions around the extent to which substantial changes can be further pursued. Looking toward solutions from across and within Asia, many regional and local concepts as well as social movements guided by a post-development agenda are aimed at shifting beyond a fossil-fuel based economies; notable examples include the Gross National Happiness (GNH) index in Bhutan and ideas on radical ecological democracy in India. There are also a number of implemented projects that have been shaped by a more comprehensive understanding of different forms of environmental injustice, such as energy structures that are reoriented towards community-owned models focusing on local production and consumption. This type of approach originated in the early 1980s, starting among partner communities and other cooperative activists who sought to build self-sufficient, non-market, off-grid energy solutions; distributed energy systems today now are widely recognised as an important model for building a just and sustainable future. For example, there is extensive literature documenting the vast potential of small-scale hydropower in Indonesia (Fünfgeld 2019), but these resources remain limited due to the country's heavy dependence on coal for energy production. Consequently, some civil society organisations in Indonesia have initiated demonstration projects to develop small-scale, community-owned energy systems by making use of village funds. As illustrated below, Fujino Town provides another instructive example of how grassroots action for a solution to the energy system challenge.

Independent and Decentralised Renewable Energy after Fukushima disaster

After the Fukushima nuclear disaster in March 2011, Fujino Town, located in Sagamihara City of Kanagawa prefecture, Japan, began examining opportunities for a shifting away from centralised energy infrastructure towards an independent and decentralised renewable energy system. Voluntarily operated by local residents, activities have included both construction of renewable power generation systems, research and knowledge sharing on effective energy usage, and promoting peer learning by educating the public on disaster prevention. Fujino is also part of the Transition Town initiative, which is an international grassroots movement aimed at encouraging lifestyles that foster sustainability and ensure a safe human environment. Energy transition activities such as these are also part of a broader objective aimed at positioning Fujino as a transition town for tackling climate change from the bottom-up. Fujino emphasises the careful use of local social and environmental resources with a view to designing a more sustainable, socially connected, climate-resilient community. (Source: 藤野電力, UN University 2012)

Country- and local-specific strategies should also be tailored to meet the needs of residents. Such strategies could best be worked out in full consultation with various stakeholders, including workers from the energy sector, communities and citizen advocacy groups. For instance, recognising that the intended phase out of coal stands to have unequal and varying regional impacts in Indonesia, Vietnam, and the Philippines due to

differences in labour market characteristics, the ILO (2022) suggests the creation of "just transition hotspots/zones". Doing so would help in formulating locally diversified economic plans that support decent work and provide community stability for culturally and socially just transitions. Correspondingly, when climate targets were initially introduced to remote communities in Thailand in line with the country's Climate Change Master Plan, the government made efforts to communicate via local languages, as opposed to making use of technical jargon and terminologies unfamiliar to rural people.

Policy Participation Group in the Korean Presidential Committee on Carbon Neutrality

Korea announced its New Deal in early 2020 as a part of the COVID-19 recovery plan and outlined key strategies supporting the programme, including recovery measures, expanding infrastructure for a green and digital economy, supporting job creation, and improving social security systems. The Green New Deal, however, outlined the country's ambition to move towards net-zero without including a set target year. After the net-zero declarations of China and Japan were subsequently made later in 2020, Korea eventually pledged its goal to achieve carbon neutrality by 2050. In order to formulating actions aimed at meeting that goal, a Presidential Committee on Carbon Neutrality (PCCN) was established, and policy roadmaps were designed in close consultation with different stakeholders. The PCCN is comprised of 8 subcommittees, with just transition making up one of the key divisions; others focused on climate change, energy innovation, science technology, green lifestyles, and so on. A people's policy participation group was also established with a focus on collecting and reflect pubic opinions in relevant policy discussions and encourage the active involvement of citizens.

(Source: Lee and Woo 2020; 대한민국정책브리핑. 2021)

The aforementioned cases provide relevant examples where modifications were made to adapt existing models to national contexts or local situations rather than to pursue complete and radical transformation. Other cases that also might be considered in Asia include contemporary but frequently overlooked alternative ideas and approaches that in the past served as the basis for much of the philosophy and culture in Asia: in other words, indigenous epistemologies. Much of this wisdom is guided by the idea that humans and nature are inextricably parts of the same whole. Contrasted with the human-nature dichotomy that has characterised much of Western thought since the time of the Enlightenment, the concept of distributional justice between human and nature in environmental justice itself could also be interrogated in this way. Industrialism and modernity—sometimes thought of as twin components of dominant culture—coerces living-beings into a morbid state that separates and alienates us from the wider natural world. Overcoming this alienation is only possible by taking a more holistic view that emphasises ecological literacy and human values (Lee 2008).

Against this background, the philosophy set out by Thailand's Sufficiency Economy, for example, addresses the root causes of climate change such as excessive material consumption and production, while also seeking to

mitigate adverse and disproportionate impacts of the climate crisis on rural farmers. The Sufficiency Economy philosophy is developed by the late Thai King Bhumibol Adulyadej. The philosophy is built on the following components: 1) production and consumption at a moderate level (moderation), 2) consideration of stakeholders and anticipation of possible outcomes (prudence), 3) resilience of economy against external shocks (self-immunity), 4) knowledge, and 5) morality. It stresses the importance of "the middle path and the need to balance forces of globalisation with the needs of local resilience" (Birnbaum and Fox 2014), and has guided sustainable and resilient rural development efforts, including through improved water and agricultural land management for agriculture. A number of Sufficiency Economy projects have also been implemented with a view to assist rural farmers with identifying opportunities for generating more resilient livelihoods. For instance, many Agri-Nature Learning Centres have been built throughout Thailand to instruct about sufficiency economy-based living as well as serving as survival shelters during times of crisis (Birnbaum and Fox 2014). Doing so has helped in strengthening adaptive capacities of communities to climate change while conserving and protecting local natural resources (Kansuntisukmongkol 2017). Some studies suggest that Sufficiency Economy buffered communities against food price hikes that occurred during the COVID-19 pandemic (The Nation Thailand 2022).

Many countries in the Asian region still rely on rural agricultural based lifestyles. Yet, in view of evidence that one-third of world total GHG emission contributions is associated with agri-food systems, through agricultural land, pre- and post-production activities of food supply chains (FAO 2021; Tubiello et al. 2021), it is clear that current models of production and consumption is based on the prioritisation of industrial agriculture. Exploring ways to improve self-sufficiency through small-scale community-based local activities therefore has great potential for progressively bringing down GHG emissions and ecological footprints as well as revitalising sociocultural norms for strengthening ecological sustainability (O'Neill 2020; Kallis et al. 2020).

One instructive example is the Cabiokid project conducted in the Philippines, which started in 2001. Among other achievements, the project successfully transformed a monocultured farmland into diversified organic agricultural sites by making use of permaculture techniques and involving local community members. The site supports self-sufficient food systems, achieves close to zero waste, is moving toward more becoming entirely powered by renewable energy, and ultimately has become a learning centre for regenerative agriculture. The project is run by a non-profit organisation made up of local people. A women's cooperative was established in the community that houses the project to support this project. Similarly, Sarvodaya Shramadana Movement in Sri Lanka was started by a high school teacher and his students, eventually becoming one of the largest development organisations in Sri Lanka, effectively mobilising a large-scale democratic revolution that champions efforts to eradicate poverty and reduce inequality. Under these efforts, the Lagoswatta Ecovillage was created as a response to recovery from the 2004 tsunami.

6. Conclusion

International discussions around just transition emphasise accelerating a shift towards resilient, inclusive and sustainable societies. However, it is important to underline that this process should not only be limited to workers affected by economic restructuring efforts to achieve net-zero emissions. Indeed, it is critical that central government, local authorities, citizens and local communities around the world are part of a broader social dialogue aimed at protecting the rights of workers and others impacted by net-zero policies. This is because workers employed in the fossil fuel industry continue to suffer from negative health and environmental impacts as well as the increasing risk of unemployment. Seen from this light, a just transition is not merely a shift to a clean and green economy: it represents a holistic transformation of society that seeks to avoid the failures of economic liberalisation, especially in the view of the rights of frontline communities, marginalised groups, and those previously left behind.

These challenges are multidimensional and complex given that many of the issues facing workers and communities vary significantly according to the geographical regions in which they reside. Taking this into account, proposed solutions should also be tailored and contextualised, especially in cases where a just transition requires consideration of diverse views about equity and fairness. Indeed, such an understanding may start with identifying how social and environmental policies and programmes might be better informed by inclusive policy dialogues organised among different groups of stakeholders. Any such effort would extend beyond the public sector and include the participation of various actors, with a guiding vision of minimising impacts and maximising equality (Bickerstaff et al. 2013). Put another way, the success of a net-zero transition depends on the extent to which resources, values, interests, and beliefs are shared (Demski et al. 2015; Bentz et al. 2022) which, in turn, depends on the active involvement of a range of different stakeholders.

As highlighted in this paper, a number of issues often preclude local communities in Asia from contributing effectively to a net-zero transition. Addressing these structural challenges, including providing a voice to stakeholders whose livelihoods are linked to the fossil fuel-based economy, should be given due attention. Following this recognition, further analyses can determine whether intended net-zero policies may aggravate social tensions and inequality over the course of transition. Solutions should aim to specifically engage workers, communities, and other local stakeholders via local and inclusive consultations, both prior to and over the course of project and programme planning as well as policy formulation and review processes so as to ensure appropriate representation. More importantly, in line with Temper (2019: 104) "rather than simply participation, justice must [also] include self-governing authority". Here the concept of self-governance may possibly conflict with that of procedural justice; nevertheless, any such disparity should be carefully deliberated upon and corrected as part of wider efforts aimed at achieving a just and sustainable future for all.

Installing solar panels and constructing wind turbines, while necessary in themselves to achieve a net-zero future, do not consider issues of equity and social justice. In order to improve prosperity of all and foster a truly just transition, policymakers' attention should go beyond addressing the needs of low-income countries, disadvantaged communities, and other vulnerable stakeholders, including workers. Similarly, future efforts to expand Asia's vision of just transition might also take note of traditional Asian values related to sustainable and modest lifestyles. Envisaging ways to achieve net-zero should begin with an acknowledgement of those already practicing low-carbon lifestyles, as well as understanding and nurturing those in need, including the elderly, children, and the greater natural world. Presently, Bhutan is the only Asian country to have already achieved net-zero. Undoubtedly, all countries are different, but there remain many lessons yet to learn.

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