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Climate change and sustainable development issues: arguments and policy initiatives

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ABSTRACT

Global warming has emerged as one of the most serious threats to the existence of humankind. There is also increasing acknowledgement that old arguments that focused on the exhaustion of economic resources and changing dynamics of utility are no longer necessary and useful in confronting climate change. This article reviews the main arguments that have shaped recent global initiatives on mitigating climate change and global warming. The increasing introduction of climate change mitigation initiatives comes from the recognition that such initiatives no longer require reducing economic growth. Fortunately, recent developments appear promising as the majority of the world's nations pledged at the Paris Accord of 2015 to check environmental degradation. Consequently, individual signatories have supplied intended national determined contribution proposals to the United Nations Framework Convention for Climate Change to cap temperature rise to 1.5 °C over the next century.

KEYWORDS

Climate change; economic growth; environmental policy

1. Introduction

The potentially disastrous effects of climate change was first scientifically investigated in the beginning of the nineteenth century when the melting of ice caps was suspected to be the cause of greenhouse gas (GHG) effects (Neumann 1985; Fleming 1990). However, it was only in the late nineteenth century that it was discovered that human-generated GHG emissions could adversely affect the climate (Sawyer 1972). While pure scientists focused their attention on unravelling the causes of climate change and the dangers it posed, the concerns of economists initially centred on demands on resources from population and economic growth, and its implications for the allocation of resources (Malthus 1836; Meadows et al. 1972).

Although Hardin (1969) had argued earlier about the need to consider the environment as a global common (which has seriously different implications for resource allocation), it was not until the 1990s that systematic global initiatives emerged to solve the problem. The Conference of Parties (COP) started in 1994 to deliberate annually the

initiatives to check climate change and global warming (Rasiah et al. 2016). The works of Stern (2007) and Nordhaus (2008) in particular became incisive in influencing the direction of COP deliberations. Unlike the argument earlier that called for limiting resource use and slowing down economic growth, Stern (2007) and Nordhaus (2008) offered alternatives palatable to the interests of countries seeking to grow their economies rapidly as they called for the switching of energy sources from fossil to non-fossil renewable fuels. Governments, private organizations, scholars and members of civil society have since sought the development of renewable sources of energy, such as solar, wind, waves and biomass to fuel economic growth.

It is at the COP21 meeting that the Paris Accord was signed by several United Nations members to check temperature rise to 1.5 °C over the next century (UNFCCC 2016). While global efforts have set the broad framework to mitigate climate change and global warming, individual countries and regional groups of countries have also initiated programmes to green the environment. Thus, this introductory article discusses the main arguments and policy initiatives on checking climate change and global warming, and the articles that subsequently follow to discuss some of these initiatives, and consequences using South-East Asia as the laboratory.

2. Main arguments

Economic discourse on environmental issues can be traced indirectly to Malthus' (1836) initial arguments on overpopulation. This postulation addressed the Earth's capacity to support population growth by drawing on the assumptions that food production will only grow arithmetically while population has been growing geometrically. This was followed by Ehrlich's (1968) claim that overpopulation was the cause of poverty. However, the first serious scientific study on the impact of environmental pollution came when Meadows et al. (1972) advanced the argument about the limits of growth. Using computer modelling as the methodological instrument, this study argued that the world can only handle a certain pace of growth beyond which it will be harmful to humankind. The focus of their argument was on how the widening gap between resource sustainability and economic growth demands was likely to destroy planet earth.

Meanwhile, heterodox economists began questioning pure neoclassical economic theory on the role of markets when dealing with the environment as the environment is a global common as pointed out by Hardin (1969). Environmental externalities are hardly addressed effectively by market transactions. Hence, Baumol (1991) subsequently argued that the special characteristics of the environment necessitate government intervention to correct market failures. It was not until the 1990s that serious attention was devoted by economic theorists on analysing the environment in economic development. It came initially with the inverted 'U' shaped relationship that Kuznets had originally traced between income distribution and the logarithm of Per Capita GDP using a longitudinal study of the developed countries. Panayotou (1994) used this logic to advance the Kuznets inverted 'U' shaped relationship between pollution intensity and the logarithm of GDP per capita. This argument assumed that all countries will experience a rise in pollution first as income/capita rises, and subsequently will experience a fall once a threshold of per/capita has been reached at the point when the utility of the environment exceeds the utility of material development. While the assumptions used to make this argument have been

argued to be static, its biggest shortcoming arises from the fact that the environment is a global common so that it is inevitable that the consequences of climate damage in one location will have disastrous consequences on the whole globe.

Fortunately, the subsequent findings from Stern (2007) and Nordhaus (2008) show convincingly that climate change and global warming are caused primarily by human activity owing to the heavy use of fossil fuels. Consequently, efforts to check climate change and global warming have led to snowballing interest on changing human consumption patterns from utilizing polluting to non-polluting sources of energy.

The Stern (2007) and Nordhaus (2008) reports opened up the first significant global consensus on checking climate change and global warming, though the COP that was started to address climate change had begun in 1994. Whatever their shortcomings, it is clear that major players on the debate recognize the link between resource sustainability and the environment. It is for these reasons that the COP meetings coordinated by the United Nations Framework Convention for Climate Change (UNFCCC) have pursued collective action by members to institute climate mitigation action without compromising on economic development (UNFCCC 2016). Much of the deliberations of COPs have since followed the direction prescribed by Stern (2007) and Nordhaus (2008) who make the case that climate change can be solved through a focus on switching the use of fuels from fossil (such as coal, oil and gas) to environment friendly sources (such as wind, biomass and solar). There has been a plethora of studies since then that have made projections from the use of policy instruments, such as carbon tax and the subsidization of backstop technologies to shift human activities with a focus on sustainability (e.g. Rasiah et al. 2016).

3. Policy initiatives

It is obvious from the foregoing discussion that sustainable development – both the utilization of methods directly and the inducement of transitions towards it to provide an alternative green path – has increasingly become important. However, adaptations to support sustainable practices, including mitigation strategies have posed challenges among the developing economies. Indeed, the UNFCCC moved the deadline to meet the COP21 targets from 2030 to 2050 at the COP22 meeting in Marrakech in 2016 owing to the struggle faced by the developing countries to meet the planned schedules. With the exception of Singapore, the agricultural and manufacturing sectors are still the primary engines of GDP growth among the remaining South-East Asian countries, which are notorious for their carbon emissions. Hence, the main challenge faced by these countries is on how they can reduce drastically GHG emissions without compromising economic growth. Clearly, agricultural and manufacturing production management must increasingly be driven by green technologies for these countries to meet their COP21 and COP22 pledges. Sustainable development therefore requires consideration of the balance between economic production and environmental and social harmony.

The UNFCCC has played a major role in sensitizing governments on the dangers of GHG emissions. Indeed, by the end of 2017, it had organized 23 COPs, bringing together in the process, regional and world leaders to deliberate on capping temperature rise globally. It was at COP21 that the ‘Paris Accord’ became a milestone in human history when 186 countries pledged to limit earth’s temperature increase to 1.5 °C over the next century. This landmark agreement was revised at the 2016 Marrakesh Proclamation to extend

the Intended Nationally Determined Contribution (INDC) deadlines of the developing countries. These countries submitted emission reduction pledges (which cover 96% of global emissions), and agreed on procedures for evaluating progress, and updating their pledges (Bodansky 2016; Falkner 2016). In the absence of mitigation efforts to check human made climate, global temperatures are projected to rise by about 3–4 °C over the pre-industrial levels by 2100 with risks the earth to catastrophic warming (Christoff 2016). Low-lying coastal areas and agricultural lands (especially wet paddy fields) will be drowned if water levels rise as a consequence of rising temperatures (Huq et al. 2015; Pettengell 2010), which is among the reasons why the UNFCCC is committed to mitigate climate change and global warming (Rajamani 2016; Morgan, Dagnet, and Tirpak 2014).

South-East Asia is an excellent laboratory to test proposals currently available to cap human-created carbon emissions as member countries have submitted to the UNFCCC INDC proposals to reduce GHG emissions intensity of GDP relative to the emissions intensity of GDP in 2005.¹ Quantitative targets are attractive, and their desirability in projecting emission prices is widely accepted, which is partly why the INDCs have a strong appeal as they explicitly state carbon pricing, and annual average emission targets even if actual emissions fluctuate to deviate from projected figures. Potential revenues from carbon taxes are also attractive on fiscal grounds. Eventually, the full realization of the Paris Accord requires a reduction in carbon emissions over the next 100 years to cap human activity caused temperature rise over the next century to 1.5 °C.

Also, while the projections take account of de-carbonization and abatement costs, they will also require frequent recalibration to ensure that unforeseen random disturbances and the shortcomings of static input–output results from computable general equilibrium models are addressed. In addition, the works of sustainability transitions scholars, such as Sonnenfeld and Mol (2010) and Berkhout (2011), are also important as they focus on inducing sustainability transitions through interventions, especially in poor economies. Sustainable development therefore requires consideration of the balance between economic production, and environmental and social harmony.

It is for the above reasons that this special issue seeks to bring together environmental scholars with interdisciplinary approaches to deliberate on these questions so as to draw policy implications for the South-East Asian nations. While global climate change mitigation can be modelled using input–output tables and assumptions that allow the construction of national input–output tables for countries using secondary data when such tables are unavailable, this issue seeks to bring together articles with different scopes to focus on the Association of South-East Asian Nations. However, given the wide range of causes that characterize climate change and the complexity of the issues, this volume is a compilation of greening initiatives from different levels and sectors. It does not seek to offer a comprehensive account of climate change initiatives in South-East Asia. Nevertheless, it discusses specific issues on climate change and sustainability issues using available empirical evidence.

4. Issue outline

The rest of the article deals with particular initiatives and relationships either by country or by a group of countries in South-East Asia. Following this introduction, Rasiah et al. (2018) undertake projections in the second article using input–output tables and non-linear computable general equilibrium models to compare the climate change and

economic consumption consequences of the existing business as usual approach and the INDC schedules submitted by individual ASEAN members to the UNFCCC over the period 2010–2060. They conclude that ASEAN economies can be significantly decarbonized if the INDCs are carefully implemented while the patterns of per capita consumption can be sustained. The carbon tax revenue is expected to finance the development of greening backstop technologies so that members will not face a loss of resources over the long run.

The third article by Masud et al. (2018) evaluates the relationship between the environment and income inequality over the period 1985–2015 using Indonesia, Malaysia, the Philippines, Thailand and Vietnam as cases and deploying panel regressions and the Granger causality test. Their results show that lowering income inequality can reduce environmental degradation. The fourth article by Mia et al. (2018) deploys an unbalanced panel data of 274 micro-finance institutions in South-East Asia from 2000 to 2014 to investigate their contribution to greening the environment using GHG emissions from the agriculture sector as the proxy for the environment. The results show that the main variables of borrower numbers, number of loans outstanding and average loan over gross national income per capita have a negative effect on GHG emissions. Their results allow them to conclude that these organizations should be incentivized to stimulate environmentally sustainable goods and services. The fifth article by Ambrose, Rasiah, and Al-Amin (2018) analyses the potential reduction in the damage to the environment following the introduction of hydrogen fuel cell vehicles in Malaysia over the period 2015–2030 using scenarios of slow, moderate and high adaptation levels by deploying an adapted dynamic computable general equilibrium model for the economy and environment. Although real GDP is expected to slow down over the period 2015–2030 under all three hydrogen adaptation scenarios used, the welfare benefits are expected to expand as hydrogen fuel cells substitute for fossil fuels.

The sixth article by Akhtar et al. (2018) analyses the impact of farmers' perception, awareness, attitude and adaptive behaviour on climate change mitigation in Malaysia. Their findings show that most respondents perceive that a decrease in rainfall and an increase in temperatures over the period 2000 till 2015 are consequences of climate change. The study also found a significant and positive association between farmers' perception of climate change, awareness, attitudes and adaptation behaviour. Sadoi (2018) subsequently examines in the seventh article on how the governments of Indonesia, Malaysia, the Philippines and Thailand have attempted to implement Euro 4 models to reduce gas emissions with a special focus on the Philippines. Using secondary material and interviews, this paper also discusses the impact of Euro 4 models on technological specialization of automobile assemblers, system suppliers and local component suppliers. The final article by Islam and Khan (2018) seeks to capture the nature of socio-economic threats associated with climate change and natural disasters that are experienced in South-East Asia. Based on a qualitative and interpretative meta-synthesis, this article finds that large numbers of local communities in these countries are displaced and subjected to resettlement with manifestly low levels of livelihood resilience.

Overall the choices for the South-East Asian countries are not many. The Paris Accord of 2015 and the subsequent Marrakesh Proclamation of 2016 demonstrate the seriousness of most United Nations members over the need to mitigate climate change and global warming. Although the Donald Trump administration had withdrawn the United States participation from following the policy direction set by these agreements, the European

Union and Japan have stuck to their decarbonization schedules as defined by the UNFCCC. In fact, these countries have also legislated to ban from their roads the internal combustion engine from 2040. Hence, there is only one reasonable choice for the South-East Asian countries, which is to participate jointly with world bodies to decarbonize the global economy. However, such efforts are not costless and will require herculean efforts to mobilize finance to support the development of greening technologies.

Note

1. The Marrakesh proclamation also called for an injection of USD50 million from the developed nations to support temperature capping initiatives in the developing countries.

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