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Sustainable Development and Energy Transition in Europe and Asia

Edited by
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Sam Dzever, Jacques Jaussaud
Robert Taylor

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Introduction

Sustainable Development and Energy Transition: Introduction and Overview

The book chapters, derived mainly from the revised versions of the papers presented at the 24th International Euro-Asia Research Conference held in Barsac, France, in May 2019, focus on sustainable development and energy transition. In the face of industrial pollution, environmental degradation and resulting climate change in the form of global warming, Western governments – at least partly in response to public protest – have become committed, through international agreements like the Paris Accord, to sustainable development. In contrast, the leaders of developing countries, for example, those of Southeast Asia, have prioritized economic growth, even at the cost of ecological damage, and have only lately become cognizant of environmental cost. The adverse effects of pollution and unrestrained carbon emissions are global, overriding national boundaries, and – accordingly the definition of sustainable development goals – has had to be extended, encompassing factors such as health, education, gender equality, action on climate change, and regional peace and stability, particularly in Asia. Following the implementation of International Health Regulations in 2010 and the submission of reports by subscribing countries, there is, for example, a designated need for a collaborative response to chemical safety and radiological emergencies. Given the challenges presented by migration, for instance, Rohingya refugees from Myanmar, a premium is placed on

Introduction written by Robert TAYLOR.

the provision of educational opportunities for migrants to ensure their social integration into countries receiving them. Gender equality is crucial in employment, given forms of discrimination against migrant women who are vulnerable to trafficking and gender-based violence. Women may also witness a disproportionate share of unpaid care and domestic work. In addition, given globalization and transnational supply chains, production and consumption in a number of countries may be adversely affected by national disasters, as witnessed in the 2011 Japanese Tohoku earthquake and tsunami [RAJ 19, TRI 19].

The above categories lead to the discussions described below relating to sustainable development policies in China and Southeast Asia. As the world's second largest economy and the major user of fossil fuels, China's policy may be seen as providing a template against which approaches in other Asian countries may be judged. China and India, in addition to the United States, may be considered pacesetters in renewable energy development, whereas Southeast Asian states lag behind, even though, as indicated below, the latter have enormous potential for solar, wind, ocean, river, or geothermal energy [MAS 18].

China's moves to protect the environment have been in response to pressure from both global institutions and local people, incensed by the effect of pollution on health, and this represents a radical departure on the part of the Chinese government which, until recently, saw foreign blandishments as a Western conspiracy to inhibit the country's economic growth [CLA 17]. In response to public concern, in 2014, Chinese Premier Li Keqiang declared war on pollution and inefficient and blind development, but Chinese policymakers are still mindful of any adverse impact of sustainable developments on economic growth [US 19a].

The following indicates the magnitude of the Chinese task. China burns 47% of the world's coal, with consequent effect on air quality in Beijing which is surrounded by coal-burning power plants. Similarly, it is estimated that more than half of China's surface water is so polluted and undrinkable, and 90% of underground water for irrigating farmland is polluted. The increasing demands of agriculture have led to deforestation and desertification, as well as a drop in biodiversity. Even more alarming has been the emergence of the so-called "cancer

villages," due to chemical and heavy metal pollution. These trends have been exacerbated by increasing middle-class consumer demands, whether for diversified diet, say in the form of beef, as well as by expanded fuel usage for growing car ownership [LAL 13].

Especially since the introduction of reform initiatives by Deng Xiaoping in 1978, a major obstacle faced by Chinese lawmakers has been the local implementation of legislation, following the traditional and often fraught relationship between the central government and the provinces. Specifically, local governments have often been loath to enforce health, safety, and environmental laws, given the need to avoid unemployment and resulting social unrest which potentially threatens social stability. One hidden agenda in the Environmental Protection Tax Law of China being implemented since January 2018 is to provide incentives for local enforcement. The law includes air pollution, water pollution, solid waste, and noise as the four major categories of taxable emissions. The law specifically designates the local tax bureaus as collectors of the new environmental protection tax. Local governments have discretion regarding the tax rate within a range specified by the central government. The whole amount collected will become part of local tax revenue. In addition, the unleashing of local government initiative and responsibility is indicated by the enactment of the Water Pollution Prevention and Control Law to be implemented nationally through the "river chief" system, originally piloted in Jiangsu. In an industrial context, there are increased penalties for breaking the law in the discharge of pollutants [COR 17]. Finally, the Law on the Prevention and Control of Soil Pollution continues the focus on cleaning the environment [ZHA 18a, ZHA 18b]. The above environmental legislation officially makes no distinction between Chinese and foreign companies, with implications additionally for supply chain management [COR 17].

The above discussion regarding the implementation of China's environmental legislation, including lately a carbon emissions trading scheme being piloted experimentally in several provinces, may be summarized as the remedial action being taken by the Chinese authorities [CLA 17].

The Chinese leaders have, in commitment to the 2015 global accord aimed at curbing temperature rises, pledged to bring down

China's total emissions to a peak around 2030. A Chinese climate experts source, however, claims that this goal will not be achieved unless limits on carbon emissions are included in the forthcoming 2021–2025 Five-Year Plan. According to the source, on a business as usual trajectory, annual CO_2 emissions would grow from 11 gigatons in 2020 to 14.3 gigatons in 2030 and would still be rising [US 19b].

Such goals, however, demand not only the kind of remedial action outlined earlier, but also a constructive innovative policy based on renewable energy.

Integral to moves toward the use of renewable sources is an increase in energy efficiency as China moves away from being the world's workshop, especially for labor-intensive goods, toward an expanding service sector. Avoidance of unnecessary waste will foster a sustainable economy and encourage renewable energy use. Energy efficiency relates not only to consumption of energy, but also its production; the rate of recovery in coal mining is low since much extraction comes from inefficient small-scale coal mines. In line with this focus on efficiency is the emphasis on green energy, a priority of the current 12th Five-Year Plan, as stressed, for instance, in the Renewable Energy Law. An indication of the Chinese lead in renewable energy is research into underlying technology, with the Chinese having a total of 29% of the global patent. China, for example, is the leading country in the world in electricity products from renewable energy resources, double that of the second ranked United States, with renewable power coming mainly from hydroelectricity and wind, such growth being faster than that of fossil fuels and nuclear power capacity. While domestic demand is such that coal-powered plants still satisfy many of China's energy needs, in 2017, renewable energy represented 36.6% of China's total installed power capacity and 26.4% of total power generation. The rise in the share of renewable resources in energy is also a national security issue, given the possibility of interception of imports.

China's investment in renewable resources will now be placed in a global context through invested sectors. In 2007, China accounted for US $126.6 billion or 45% of the global total of US$279.8 billion invested in renewable energy. An example of hydropower development is the Gansu Dang River Hydropower Project, which, in

2007, was registered as a Clean Development Mechanism project in accordance with the requirements of the Kyoto Protocol to the United Nations Framework Convention on Climate Change. More hydropower projects are being approved. Global perspective also reveals China's production of wind power, with the country being the largest producer after the United States, Germany, and Spain in 2008. There has also been a spin off for industry, with the commercial production of turbines and components. The Chinese government has also created an incentive scheme for the technological development of solar power, with China becoming a world leader in the manufacture of solar photovoltaic technology. While the production of fuel is far more contentious, given global concerns about the competition between corn, both as an energy source and as a food, with the potential for price rises, China has become, like the United States, and Brazil, a major producer of ethanol. Perhaps, geothermal power is more environment-friendly, which has considerable potential in China as an renewable energy resource [DUD 19, WIK ND].

In pursuit of renewable energy objectives, more challenging than green power generation is the fueling of vehicles environmentally because, in China as elsewhere in Asia, with a rising middle class, car ownership is also increasing, with potential for resulting deterioration in air quality. In spite of the current quality issues discussed below, Chinese leaders seek to dominate the global New Energy Vehicles (NEV) industry. Since 2015, the Chinese government has, through subsidies to car makers, battery manufacturers, and vehicle purchasers, supported the industry, prioritizing research and development (R&D) and obtaining technology from foreign joint ventures. Significantly, China's largest electric vehicle maker is BYD, backed by the American Warren Buffett organization. Additionally, several city authorities have restricted the issue of license plates for traditional cars, thus encouraging drivers to buy electric vehicles. Consequently, in 2018, Chinese manufacturers sold 1,256 million NEVs, mainly electric cars, with China accounting for more than half of such global sales. In June 2019, Chinese government policy changed; subsidies relating to consumer purchasing fell at least 65%, resulting in lower profit margins for manufacturers, the intention being to force automakers to produce better quality electric vehicles. Lack of quality control is indicated by the recall to manufacturers of

135,700 electric vehicles in 2018, representing an industry wide rate of 10.8%. Faults include low-quality batteries, motors, and transmission systems. In response, the government's steps to eliminate subsidies have been designed to restrict the growing number of low-quality entrants to manufacturing. Closely linked is inferior battery performance on the road which can only be remedied by better industrial standards and certification [MIN 19, US 19c].

In addition, Chinese government policy has also sought to support the fledgling hydrogen-powered industry. The newly established Anhui Mingtian Hydrogen Energy Technology Company, for example, manufactures fuel stacks for vehicles powered by the element which produces no emissions from the tail pipe. According to BloombergNEF, the fuel-cell vehicle industry has received more than US $1 billion worth investments from Chinese companies. For the time being, government support for fuel-cell vehicles may well remain, even while subsidies for the electric car industry are being cut [US 19d].

Within this overall context of remedial and constructive innovative action, attention is now turned to Southeast Asia. Current economic and social trends suggest that the states of the region will, even though belatedly, follow a sustainable development trajectory similar to that of China. Energy consumption in Southeast Asia has doubled in the last two decades, with heavy reliance on fossil fuels, especially coal, both for power generation and transportation [IRE 18]. Demand is likely to increase, with an increasing number of middle-class consumers enjoying rising living standards. This has resulted in the greater accumulation of waste. Significantly, individual Southeast Asian countries, like China, have taken steps to limit the importation of waste, Malaysia and Vietnam being examples. Ironically, advanced economies exporting waste are in a much better position to develop environmentally recycling technologies, even though businesses, for instance, in Indonesia, have gained a profitable source of income by such measures [SEM 19].

Although the above has outlined some initiatives by individual Southeast Asian countries, there is a growing acceptance that waste management must proceed at a regional level, an instance being the recently adopted Bangkok Declaration on Combating Marine Debris at the Association of Southeast Nations (ASEAN) Summit in Bangkok

in June 2019. Although the agreement is a major step forward, it does require policy coordination between countries, which often lack proper disposal facilities to curb, say, plastic pollution. Moreover, shared river systems, like that of the Mekong, are the conduits for ocean plastic pollution, land-based activities being a major source of marine debris. One solution is the circular economy model, currently being developed by Singapore and Thailand, through which the disposal of waste and the need for raw materials is lessened by implanting the system of reduce, reuse, recycle, refurbish, and re-manufacture in the production, distribution, and consumption processes [TRA 19].

Although remedial measures are crucial in the short term, in the long run the key lies in the development of sustainable energy sources. In fact, Southeast Asia's renewable energy potential is still largely untapped. This potential was implicitly acknowledged in the establishment of the ASEAN Centre for Sustainable Development (ACSDSD) in Thailand, signaling growing cooperation among regional countries [PIT 19].

Although there is still a greater need for policy coordination at a regional level, national initiatives have led to cumulative investment in renewable energy amounting to US$27 billion between 2006 and 2016 [IRE 18]. It is realized at regional levels that energy demand now exceeds supply and, given environmental degradation, renewable resources are the preferred sources to reduce greenhouse gas emissions, lest future economic and social development be impeded. Importantly, energy demand has increased by 60% in Southeast Asian countries in the last 15 years, challenging the availability of existing energy resources, especially in relation to the dominant transportation sector. Most Southeast Asian countries remain heavily dependent on fossil fuels for energy needs, but national governments are seeking to develop environment-friendly energy sources through incentives and carbon taxes. ASEAN has agreed on a 23% target for sustainable renewable resources by 2025. The following national examples will briefly illustrate progress to date. In Indonesia, the government's target is the achievement of optimal energy use nationally by 2025, the objective being to reduce dependency on oil, gas, and coal which are in danger of not coping with future demand. Similarly, the Philippine

government has introduced legislation to promote the use of renewable energy by developing resources and organizing management to support policy implementation. Singapore, a regional pacesetter in many policy areas, has a strategy to achieve efficient renewable energy, with the aim of reducing emissions at the business as usual level between 7% and 11% by 2020. Likewise, the Vietnamese have a target to increase the share of renewable energy by 5% in 2020, with an estimated increase of 11% in 2050. Malaysia's policy is to achieve 5% renewable energy use for nationwide electrical energy needs by 2030. The Malaysian authorities are instigating surveillance concerning marine energy potential. Lastly, to promote energy conservation, the Thai government has a target of 3%–5% renewable energy use for all power-generation capacity projects. Geothermal and marine energy have also been slated as renewable energy sources in Thailand.

In summary, these targets, while presenting challenges, also offer opportunities. Policies require investors who may reap substantial returns. The development of renewable resources locally may not only help to ensure local control over energy supply, but also provide employment through job creation, with attendant revenue generation.

Nevertheless, national subsidies for fossil fuels and slow implementation of supporting policies in individual countries as yet preclude regionally integrated commitment to sustainable development. The large-scale development of renewable resources may be furthered through national and regional measures. National governments can target a long-term energy mix including renewable resources. In the implementation of energy policies in individual countries, incentives are crucial for financing the development of renewable resources and involve financial policy instruments. Exchange of information and expertise between states to enforce sustainable energy standards is also necessary. The expansion of the ASEAN Power Grid will link the energy resource endowments in the region as a whole [ERD 19].

Concluding remarks

In conclusion, this overview serves as an introduction to the general rubric of sustainable development and energy transition,

discussed in the following chapters. The leaders of China, still often categorized as a developing country, have, in recent decades, become increasingly aware of the adverse environmental effects of unfettered economic growth. Accordingly, under pressure from global institutions and in the face of domestic public opinion incensed by the damage done to health, the Chinese authorities have taken remedial action to stem, for example, the harm caused by air and water pollution as well as by the effects of deforestation and desertification. A major problem, however, is local implementation, given the regional government's fear that strict enforcement will affect employment and result in social unrest. Changes in tax laws have, however, been designed as incentives for local authorities.

The above constitutes the remedial action. Reducing the effects of climate change and global warming demands more affirmative action in the form of a constructive innovative policy based on renewable energy, with priority given, for instance, to the development of electric vehicles, hydroelectricity, and wind and solar power. Given that carbon emissions in transportation are a cause of global warming, the Chinese leaders have sought domination of the electric vehicles industry, even though there are quality issues.

The Chinese approach may serve as a template for Southeast Asian countries which are still heavily reliant on fossil fuels, given demand from increasingly affluent middle-class consumers. Although there are initiatives by individual countries, the key to successful remedial waste management may well best proceed at a regional level; river systems like the Mekong are conduits for ocean-based pollution. Because of heavy dependence to date on fossil fuels, some Southeast Asian countries have targeted the development of, for instance, geothermal and marine energy sources.

Regionally integrated commitment to sustainable development via renewable resources has been hindered by national subsidies for fossil fuels and ineffective supporting policies in individual Asian states. Exchange of expertise between states and the expansion of the ASEAN Power Grid will further regional-level coordination.

The chapters in this volume offer a wide-ranging perspective relating to sustainable development and energy transition in Asia. The

Chinese case is examined in Chapters 2 and 3. In particular, Chapter 2 investigates China's coal dependency by looking at the short- to medium-run dynamics existing between coal price volatility and sectoral stock exchange performance. Chapter 3 discusses the steps that the Chinese government is taking in order to implement a clean energy strategy with the idea of "ecological civilization" in mind. Energy transformation and the move toward a sustainable green energy sector are also issues dealt with in Chapter 8 which considers the case of Southeast Asian countries. Chapter 7, focusing on Indonesia and Laos, analyzes the effects of the rapid expansion of palm oil production in both countries.

The notion of "ecological economics" is also explained and developed in Chapter 4 in the context of urban logistics in the case of Japan. The international dimension of sustainable development is covered in Chapter 5 which investigates whether the recent EU–Japan free trade area (FTA) can be regarded as a norm-setter regarding sustainable development issues in the future FTAs that the EU will/might sign with other countries in Asia. Chapters 1 and 9 deal with a socioeconomic issue of sustainable development, namely the role of women in economic growth: Chapter 1 from the perspective of microfinance in Vietnam and Chapter 9 from the viewpoint of female researchers in Japan. Chapter 6 provides an analysis of the relationship between shareholder value within multinational firms and the international transfer of environmental management practices. Finally, the central issue of food and agricultural development is explored in Chapters 10 and 11. Chapter 10 is devoted to sustainable agricultural development and rural poverty in India, whereas Chapter 11 is on consumers' attitudes toward food products containing a low level of chemicals in China when compared to the EU.

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The Role of Microfinance in Women Empowerment: Global Sustainable Perspectives in the Case of Vietnam

This study analyzes the impact of microfinance (MF) on women empowerment in the context of Vietnam. Our analysis is based on the examination of primary data obtained from the MF organizations and women's unions in the Tra Vinh province in Vietnam. We interviewed managers from various organizations at district levels to know their insights on how MF services have been made available to female borrowers and to find out the extent to which access to financing through MF products has helped them to develop their economic independence and to strengthen their role in their household and community. This study offers evidence on the positive role played by MF in the empowerment of women and also highlights the importance of economic, feminist and legal factors in the process. The main research findings point out the benefits offered by MF services not only in the context of short-term economic goals for poor women, but also in the long term with regard to improving women's role so that they become economically more independent and contribute to government planning of sustainable developmental goals.

Chapter written by Long Bui THANH, Lucía MORALES and Bernadette ANDREOSSO-O'CALLAGHAN.

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1.1. Introduction

Microfinance (MF) tools have been used quite successfully in economic development among disadvantaged social classes that are characterized by high levels of poverty, economic inequality, and social discrimination. In particular, microfinance institutions (MFIs) have been quite focused in offering support to female borrowers, aiming to help them advance and consolidate their economic independence in their families and society by offering them access to needed capital [ADB 00, BAS 07, HAS 96, RAH 17]. The cases of the self-help groups in India and Grameen Bank in Bangladesh are examples of the successful implementation of MF tools to provide loans to the poorest and to support them for the creation of small business activities that help alleviate their social and economic exclusion. The focus of MFIs over the years has been on female borrowers identified as a clear disadvantaged social class. [BAS 07, HAS 96, RAH 17]. Women are regarded as ideal clients, as they are effective in savings and repayments of microloans when compared to men [AGI 13, ILO 08, WEB 14]. In the context of Vietnam, researchers' findings suggest that women are found to be more responsible with regard to financial affairs, especially in poor families [HOL 12]. However, poor Vietnamese women face significant challenges and disadvantages as they are generally powerless in their families, and also with regard to their social and economic role that is heavily influenced and founded on a patriarchal social system, which does diminish the role of women. In this regard, MF services are of special importance, as they target female clients and offer support that helps them to manage received capital and access non-financial services that contribute to the empowerment of women in the social and family context of Vietnam [ADA 16, DIN 15, LE 13]. For these reasons, many countries across the world have become interested in the role that MF can play as a key component in the development and enhancement of the economic system. Countries have realized that MF can play a valuable role as it can contribute to social cohesion, integration of disfavored groups, and facilitation of financial resources to deprived classes. Moreover, MFIs have also helped to minimize the degree of bureaucracy associated with access to funds that deters the access to needed resources from disfavored and marginalized social classes [ADA 16, ADB 00]. To contribute to this line of research, this

study analyzes the roles of MFIs and women's unions (WUs) in Vietnam. The study explores how MF services have helped to achieve goals of poverty reduction and gender equity in the Tra Vinh (TV) province in Vietnam, a region with a significant representation of poor women. The research is supported by a qualitative approach, with in-depth interviews carried out with managers of MFIs and WUs at district levels. The research findings offer insights into the available policies, levels of access to MF services, and the positive impact that MF has on poor women in Vietnam in terms of their social and economic integrity.

1.2. MF and women empowerment

In the last 30 years, researchers examining the value of MF as a tool to promote economic development and social integration and cohesion have also considered the important aspects with regard to the role that MF can play in poverty reduction in developing countries [WOL 99, YUN 03]. Most of the poor and low-income people cannot access financial resources due to their limitations on knowledge, information, and resources available. On the other hand, gender inequity in developing countries represents major challenges for socioeconomic sustainable development and for poor women around the world who are being identified to be disadvantaged and vulnerable [ELS 02, HAW 11]. Existing support to women in MF programs come from many organizations, such as governments, societies, and non-governmental organizations (NGOs) with a variety of political perspectives [HUN 12, KAB 03, WB 12]. According to the current apparent consensus, it is possible to identify three elements with different basic aims and understanding of different policy prescriptions and priorities in relation to both MF and gender policy. The research findings by Mayoux [MAY 05] indicate that when women are empowered to access MF services through WUs, they are able to make a positive economic and social contribution. The author's findings suggest that women's contributions can help increase economic well-being and social, political, and legal empowerment. Furthermore, female borrowers can gain access to financial and non-financial services by combining the three main objectives, vis-à-vis, poverty alleviation, financial self-sustainability, and women empowerment [AGI 13, DES 13, NGO 12, WAR 15].