

Editorial

Introduction to the Special Issue on “the Sustainable Asia Conference 2014”

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Abstract: The continuous expansion and change in Asia is attracting increasing attention from the rest of the world. Thus, the papers from the Sustainable Asia Conference 2014 (SAC 2014) could provide a platform to examine outperforming governance factors and mechanisms in this dynamically growing region. This editorial for SAC 2014 will highlight the contents and methodologies of selected papers, presenting diverse issues in sustainable policies and strategies.

Keywords: Sustainable Asia Conference (SAC); governance; paradigm shift; network management

1. Background of the Special Issue

Although sustainability science shifts the academic paradigm from traditional one-way maximization to collaborative value creation, most of the existing theories are still missing the link of sustainability. When an author visited a university in the United States eight years ago, he was shocked to find new approaches around the campus such as sustainable development economics, a sustainable management seminar, sustainable literature reviews, a sustainable history special lecture, *etc.* The

traditional paradigm of economics focuses on efficiency or economies, which means maximizing outputs while minimizing inputs. The traditional framework cannot accommodate external economic variables such as social responsibility and environmental pollution issues, and thus remains focused within the realm of market failure. Similarly, the paradigm of traditional business management is still based on maximizing profits on behalf of stockholders. Therefore, this traditional approach is unable to effectively handle the diverse requirements of interest groups such as consumers, society, and government. All these traditional paradigms are based solely on mechanical approaches to get one-way enhancement. Sustainability science is based on the harmonizing partnership around diverse entities, creating the opportunity for the field to be the platform field of study for human behavioral, social, and even environmental sciences. The cornerstone potential of sustainability science has become a strong motivation for international networking for the diverse studies.

The rapid growth of Asian countries is generating more attention worldwide [1]. Countries such as Korea and China are characterized as some of the fastest growing countries in the world due to their rates of economic growth. This growth presents challenges in the new frontier of sustainability academics; technological innovations are being outperformed over time, necessitating the recalibration of cultural or local governance mechanisms to better address these distinct phenomena. It is noteworthy that an eco-friendly economic system implies that harmonized mutual feedback is crucial for sustainable performance in Asia. Even if this kind of eco-systematic approach is liberally applied in worldwide practices and theories, the Asian approach is different from that in advanced western countries. Advanced countries such as the United States and European Union countries are emphasizing the role of markets too heavily and thus the harmonized outcome of the interoperational networking of sustainable activities takes too long to effectively diffuse this market-heavy mix. In contrast, Asian countries are keen to obtain an optimal path of control as a result of cultural adaptation or outperforming leadership by top decision makers such as presidents and executives of major corporations. For example, the Chinese government argued they were not ready to participate in official international talks on environmental issues, while in their national policies, they moved toward more emphasis on awareness of carbon dioxide (CO₂) emissions beginning in 2005, reflecting this policy change in the national five-year economic plan and soon enhancing eco-friendly efficiencies nationwide [2]. This Chinese policy of “sustainable growth” supports the environmental Kuznets curve (EKC) hypothesis, which posits that environmental improvements occur after a certain level of income is reached (*i.e.*, the turning point) and government leadership could tunnel through the EKC as a shortcut for improving performance [2]. The approach is quite different from those of western countries, where the role of the market is emphasized and thus government intervention may result in worsened economic performance.

Therefore, the Sustainable Asia Conference could be an important cornerstone for a new platform for academic networking to discover outperforming governance in the most rapidly growing region in the world. Since Korean president Lee announced the launching of “green growth” in Korea in 2008, the country has hosted the Green Climate Fund and has become one of the world’s green growth hubs in a short period of time. The papers presented in this special issue will provide insight into the Asian model for sustainable governance.

2. Important Issues for a Sustainable Asia

Sustainability science is composed of the three pillars of environment, economics, and social studies. Therefore, most of the papers in this issue are based on the harmonization of these perspectives. Even so, individual sustainability issues range from the macro views of policy implications to the micro views of practical suggestions. Of course, most of the papers handle environmental issues in Asian countries, particularly in China. China is the largest greenhouse gas (GHG) emitter in the world, and recently the country's serious pollution problems have heightened the awareness of environmental issues by the Chinese government as well as the public. The Chinese government's response to this issue should be to assess the feasibility of economic growth against the constraints of resources and the environment. One study presented in this issue takes constraints on resources and the environment into account and uses frontier technology boundary analysis and directional distance function (DDF) to propose a decomposition of the sources of economic growth within the green growth accounting framework and then measures the sources of China's economic growth between 1998 and 2012 based on the new biennial Malmquist–Luenberger productivity index [MLPI] [3]. Using MLPI and based on the data envelopment analysis (DEA) and DDF, Chinese economic growth is decomposed with seven components: (1) technical efficiency change; (2) technological change; (3) labor effect; (4) capital effect; (5) energy effect; (6) output structure effect; and (7) environmental regulation effect. The empirical results show that, in general, physical capital accumulation is the most important driving force for economic takeoff, while CO₂ emissions with environmental regulation restrain economic growth in some provinces. It is argued that high growth by simply increasing factor inputs will not only result in a waste of resources, but also in environmental pollution [3]. The more serious task for the Chinese government comes from the fact that carbon emission reduction targets will not be met by controlling economic development [4]. Based on the extended Stochastic Impacts by Regression on Population, Affluence and Technology (STIRPAT) model (incorporating factors that drive carbon emissions), the determinant factors for the scale and intensity of carbon emissions could be much more important [4]. The study found the negative and significant impact of spatial-lagged variables, meaning that the carbon emissions among regions are highly correlated. Therefore, the role of provinces with low-carbon emissions could be crucial in developing a nationwide low-carbon economy. In recent years, the rural environmental pollution problem has intensified with the acceleration of urban–rural integration, especially in developed regions and countries in Asia. By utilizing the same STIRPAT model, Hongjun Dai *et al.* [5] conducted an empirical study of rural nonpoint source pollution problems in the process of urbanization and concluded that technical progress, transformation of the mode of production, and increasing the scale of financial support in rural areas are effective measures to solve the ever-increasing metropolitan pollution dilemma [5].

If we focus on the micro approach to CO₂ emission regulatory issues, the first and most important area should be the power generation industries. In China, biomass resources from agriculture and forestry are quite rich and thus a biomass power generation plant could be a good alternative compared with traditional coal-based power plants. However, carbon emissions should be considered carefully because they are influenced by the supply of straw fuel as well [6]. Without a sufficient straw supply, the plant's performance may be quite poor, resulting in lower economic benefit and higher carbon emissions. Thus, using a linear multi-objective integer program model, the research found that the

straw acquisition range could be a determining factor for the straw-based power generation plant's performance [6]. New challenges from nuclear power plants present another issue on the power generation front. The Fukushima nuclear disaster in 2011 has created severe social, political, and economic impacts worldwide, causing the public to perceive nuclear power as a threat. Influenced by the worldwide spread of anti-nuclear attitudes, people who live near nuclear power plants have shown increasing concerns about nuclear risks, also known as the "not in my backyard" or NIMBY syndrome [7]. For the sustainable development of nuclear power in China despite the NIMBY syndrome, the feasibility study for the Chinese public willingness to pay (WTP) is analyzed. Using the contingent valuation method (CVM), the research found that there is an increase of 56.7% and 69.1% of respondents' WTP for a nuclear power plant located 80 km and 30 km, respectively, from their neighborhoods, resulting in stronger NIMBY attitudes toward nuclear power plants (especially for those who live in inland areas). Even if monetary compensation has its limitations, more trust should be given to the government and the public should approach nuclear power in a more rational manner [7].

Transportation presents another issue for CO₂ emissions. According to the investigation by the Intergovernmental Panel on Climate Change (IPCC), transportation accounts for approximately 13% of total greenhouse gas emissions worldwide [8]. The logistics field is especially important for sustainable development because it includes all product life cycle treatment by carbon footprint, with carbon footprint being defined as the CO₂ emission quantity produced either directly or indirectly throughout the entire life cycle of a service or a product [9]. To plan a vehicle route with the smallest carbon footprint, instead of the conventional approach of shortest route distance, the improved vehicle routing problem (VRP) equation combined with variables in the Lagrangian approach mathematical model is adopted. When there are many alternative paths between each pair of customers, and the vehicle speed differs at different times of the day, determining a balance among various objectives is critical to minimizing the carbon footprint on the route [9].

As sustainable development gets more and more attention from the public, NIMBY syndrome forces the government to treat environmental issues with a market-oriented approach, particularly given the pressure for eco-friendly development. From the ecological perspective of a market-oriented solution, the research examines the determinants of farmers' WTP and their payment levels for ecological compensation for the Poyang Lake Wetland, which is the largest lake in China. Using CVM and Heckman's two-step model, the survey shows that 46.58% of farmers are willing to pay ecological compensation, with an average price of \$64.39 per household every year [10]. Based on the heterogeneity of the variables, it can be argued that the government should develop differentiated ecological compensation standards according to the diverse characteristics of NIMBY syndrome [10].

Among GHG emissions, CO₂ presents the most serious concern for sustainable development. Considering the aggravating effects on the ozone layer, sulfur dioxide (SO₂) could be even more harmful, and is a particularly important issue for manufacturing industries. Recognizing the need for action, the Chinese government introduced the SO₂ Emissions Trading Pilot Scheme (SETPS) in 2002 to reduce industrial SO₂ emissions. Four provinces (including Shandong), three municipalities (including Shanghai), and one business entity (the China Huaneng Group) were selected as pilot participants [11]. For the feasibility of this project, the empirical test evaluates the effects of SETPS on pollution abatement costs (PAC) from the past and future perspectives in a total of 29 Chinese provinces (including all of the pilot 'provinces') over the period 1998–2011. Results showed even if

SETPS failed to reduce PAC as a whole, PAC reduction efforts had become increasingly important since 2009, implying that Chinese government involvement could improve the system to correct any design and operational deficiencies in the present emissions trading pilot policies [11]. As a global factory, China is considered to be a black hole for global resources as well. To stabilize China's strategic diversification of global outsourcing, especially in oil supply security (seriously restricted by the imbalance of oil reserves), the empirical research analyzes the feasibility of these diversification policies. Using the oil import source diversification index, the research concludes that China, compared with the United States, has more stable diversified import sources and the government's attention has resulted in more effective import sources than in the past. In the future, however, China should adjust the distributions of regional sources rather than focusing on the "number" of sources in its diversification strategy [12].

For sustainable governance, the role of information and communication technology (ICT) and its e-business utilization is crucial because ICT and its applications serve as another platform for all continuous performance policies and practices. There are two papers on the role of ICT in sustainability science. One paper explores the macro view of ICT application in sustainable development within the context of "smart e-government," which has been proposed as sustainable, cooperative government to strengthen the bilateral partnership between the public and private sectors [13]. The study empirically examines the correlation between the quality of e-government and trust in government in Korea. Using an index developed to measure the quality of e-government services (including factors such as openness, sharing, communication, and collaboration), the survey results show a partial correlation between the quality of e-government services and trust in government, suggesting that an open attitude toward information sharing could be more important regardless of the complexity or the technicality of the issues [13]. Likewise, from a microeconomic or business perspective, the research analyzes the success of e-businesses in China. It is well known that the global leaders in the field such as eBay, Amazon, and Facebook cannot compete effectively in the Chinese market against local companies such as Alibaba and its twin, Taobao. The reason may come from the cultural competitive advantage of Chinese trust (Guanxi) [1]. Based on the structural equation model (SEM), the paper analyzes the role of Guanxi in the success of outperforming web marketing mix strategies. In general, the empirical tests show the web marketing mix is important for creating value based on relationship management in China. Of note, the web marketing strategies of communication, content, and commerce are crucial for incorporation of Guanxi with full mediation effects [1].

3. Methodologies of Sustainability Science

The issues in Asia's sustainability model raise the common paradigm of value creation based on network management. Since sustainability science is based on the harmonized partnership among interrelated entities or the activities of those entities, network management is crucial to harmonizing the relationship and to creating value from the partnership network [1]. Of course, feasibility studies for the harmonization of conflicting interests are not easy to perform and thus the methodological approaches could be diverse, but with more emphasis on the importance of sustainable performance. Thus, the research methodologies used could give us greater insights, opening new frontiers to handle new challenges in sustainable governance.

Since most papers on sustainable governance handle conflicting interests as well as multi-inputs/outputs for their models, traditional regression analyses may not match these purposes. Therefore, most papers handle the multi-input/output models using DEA and SEM. DEA is especially important in the field of environmental economics since it handles desirable outputs as well as undesirable outputs such as CO₂ [2,3,10]. SEM is also another popular approach for handling diverse survey related issues because it clarifies the role of intermediation resulting from the complexity among the variables [1,13].

The linear regression or linear transformation of multivariate variables is introduced as well. Using the STIRPAT model variation, carbon emissions are modeled stochastically via regressing it on population, wealth, and technology in log function [4,5]. To compensate for NIMBY syndrome, two papers utilized survey data with CVM to calculate the invisible values for ecological development [10] and nuclear power plant site selection [7].

Linear programming is also used. A multi-objective mixed-integer programming model is introduced to solve the site selection problem for a straw-based power generation plant [6]. Using integer programming, the study optimizes two objectives of the economic and environmental outcomes of straw-based power generation, with the supply and demand of straw as constraints. The oil import diversification index is used to determine the Lorenz curve and the Gini coefficient for the unbalanced level of the market [12]. In diversification strategies, China showed higher balanced indexes than the United States. The stepwise optimal path control approach is introduced, a genetic algorithm is developed for solving the minimal-carbon-footprint time-dependent heterogeneous-fleet vehicle routing problem with alternative paths, and the optimal vehicle routing is obtained by the stepwise numerical experiment [9].

Due to the interdisciplinary character of sustainable science, diverse approaches could and should be imported and utilized for better understanding of multivariate complexity as well as for more systematic implications and suggestions.

4. Conclusions

While environmental strategies are becoming increasingly important over time, Asian countries such as China and Korea still need to give priority to economic growth from the perspective of overall economic performance. While Korea has announced its leading role in international cooperation for development of green growth policies, daily life in China has been getting worse due to increasing pollution and other environmental issues. These environment-related initiatives need to be harmoniously promoted among diverse, and often complicated, entities and associated activities. Fortunately, these Asian countries are quickly changing their paradigms toward eco-friendly development, and the role of political and business leadership in each country's policies and business practices could enhance the performance of sustainable strategies.

However, due to the complexity of a sustainable operation for cooperative networking, it is really difficult to visualize the performance of these sustainable policies and practices. That is the reason most papers in this special issue evoke the importance of creating a new paradigm of sustainable development as well as sustainable management geared toward value creation based on harmonized network management. Networking participants will need to adopt a more field- and performance-oriented

approach to create these invisible, but precious, values—this is called sustainable governance [1] (p. 4115). In order to discover sustainable governance factors, sustainable issues as well as their methodologies should be highlighted in this rapidly changing Asian model.

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Author Contributions

All of the authors made equal contributions to the work in this editorial paper.

Conflicts of Interest

The authors declare no conflict of interest.

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