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Eco-Innovation Policies Toward Sustainability in Asian Countries

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Abstract: In the global society eco-innovation emerged as an effort to implement sustainable development as outlined during the 2012 RIO+20 conference. States and firms have established and implemented policies and strategies for eco-innovation as one route to sustainable development. Eco-innovation has been facilitated in developed countries, especially OECD members and European countries through action plans. Recently eco-innovation policies are emerging in the developing countries. Based on this context, this research aims to analyze eco-innovation policies in Asian countries. We investigated policies related to sustainable development in 17 Asian countries with the categories of policy instruments. National policies were interpreted and compared with the classification of development stages according to the World Economic Forum (WEF). As a result this research indicates different approaches to eco-innovation in Asian countries. It offers insights to designing national strategies for eco-innovation in Asia's developing countries. Therefore this research can contribute to facilitating and diffusing eco-innovation toward sustainability in Asia.

Keywords: eco-innovation, policy instruments, sustainable development

1. Introduction

The Global community set sustainable development as the goal for present and future generations at the United Nations Conference on Environment and Development (UNCED), which was held in Rio de Janeiro in 1992. Many kinds of plans and actions were established and implemented to achieve sustainable development through comprehensive approaches with economic, social and environmental dimensions. Eco-innovation is one such effort for sustainable development. Eco-innovation refers to a wide range of innovations such as renewable energy technologies, pollution prevention schemes, green products and so on.

The role of the government is important for implementing eco-innovation as it is difficult for industry to eco-innovate spontaneously, and it is important for the government to develop social structures enabling the production of eco-friendly goods and services (Lee, 2002). In order to achieve sustainable development, the government has established environmental regulations and programmes for supporting financial systems and fostering eco-markets.

Institutions have been established to promote eco-innovation and to improve the conditions for eco-innovation in European countries: R&D, financial aid, market creation, social awareness etc. In order to achieve sustainable development globally, promoting eco-innovation in Asian countries is important. However, most prior studies have dealt with European cases. In order to promote eco-innovation, analysis of existing eco-innovation policies in Asian countries is also required. First we identify eco-innovation policies in 17 Asian countries and discuss their status. Next we compare their eco-innovation policies using an analytical framework that we developed based on the drivers of eco-innovation. Lastly we evaluate these policies and present implications for governments to promote eco-innovation. Our study may contribute the facilitation and diffusion of eco-innovation for sustainable development in Asia.

2. Eco-innovation

Eco-innovation can be defined as "all measures of relevant actors which develop new ideas, behavior, products and processes, apply or introduce them and which contribute to a reduction of environmental burdens or to ecologically specified sustainability targets" (Rennings, 2000). The initial scope of eco-innovation focused on the only part of productions and processes (Fussler & James, 1996), but it in progression was expanded to a management system (Kemp and Arundel, 1998), the creation of new markets (Little, 2005), organizations (Charter and Clark, 2007), institutions (OECD, 2009a,b), material flows and social eco-innovation (EIO, 2012). The Eco Innovation Observatory (EIO) clarified and identified six types eco-innovation. The first four types (production, process, marketing and organization) were derived from the Oslo report (OECD and Eurostat, 2005). In this report, innovation is defined as "the implementation of a new or significantly improved product (good or service) or process, a new marketing method or a new organisational method in business practices, workplace organisation or external relations" (OECD and Eurostat, 2005). The remaining two types of eco-

innovation include social and system eco-innovation, which emphasize the economic, social and environmental nature or triple bottom line of sustainable development. The addition of these two types of eco-innovation extends its scope to include institutions, markets and social actors.

Eco-innovation can be implemented when regulations effected 'technology forcing'. The benefits of eco-innovation include reducing the burdens and costs of meeting environmental regulations and secondary benefits of environmental policy are often seen as increasing the competitiveness of companies and countries by supporting the creation of new market for environmentally desirable products and processes, corresponding employment effects and so on (Rennings, 2000). Table 1 shows effects and determinants of eco-innovation. Several empirical researches show that implementing the regulation make an opportunities to introduce the new technologies (Doran & Ryan, 2012). Eco-friendly life style and quality of life would be enhanced by implementing eco-innovation (Ganapathy, Natarajan, Gunasekaran, & Subramanian, 2014). In an effort to reduce environmental burden, Dangelico & Pujari (2010) highlighted the environmental effect of eco-innovation.

Table 1. Effects and determinants of eco-innovation

Division	Elements	Contents	References
Effects	Economic	· Creation of new market · Introduction to new technologies · Securement of sustainabilities on industrial organization	(Doran & Ryan, 2012; Sierzchula, Bakker, Maat, & van Wee, 2012)
	Social	· Eco-friendly life style · Enhancement on quality of life and welfare	(Sarkar, 2013; Satish et al., 2014)
	Environmental	· Reducing the greenhouse gases and enhancing environmental qualities by introducing of renewable energies	(Dangelico & Pujari, 2010)
Determinants	Supply side; Corporate activities	· Enhancement on structure of organization, value of chain and investment on employment · Economic structure, competition between the firms	(Flammer, 2012)
			(Ganapathy et al., 2014)
	Market and Social	· Community pressure, image awareness · Purchasing the green products and services	(Horbach, 2008; Kemp, 2007)
	Governments	· Regulations, incentives, financial aid	(Porter and van der Linde, 1995; Lee, 2002; Kemp, 2007; Kammerer, 2009; Leitner et al., 2010)
	Knowledge, Information and Cooperation	· Research &Development	(Charles, 1995;Scarpellini, Aranda, Aranda, Llera, & Marco, 2012)

Several scholars have studies on the determinants of eco-innovation. It is classified into four main elements of supply side, market and social, government and cooperation and information. Institutional and political influences are identified one of the main elements of eco-innovation together with the supply side (e.g. technological capability and market characteristics) and demand side (e.g market demand and social awareness) (Horbach, 2008; Bleischwitz et al., 2009). Especially, environmental

regulation, which encourage the new technologies to respond, and financial system are identified as external determinants of eco-innovation (Porter and vander Linder, 1995; Kemp, 2007; Kammerer, 2009; Doran and Ryan, 2012). Oslo manual (OECD and Eurostat, 2005) regards a knowledge as one of a factor for eco-innovation. A firm which cooperate with research institute and university shows active performance in all types of eco-innovation (Triguero et al., 2013). In this research focuses on designing governmental policy instruments for eco-innovation.

3. Policy instruments

In the process of policy making, policies are formed through selecting policy instruments and are implemented by means of policy instruments. Public policy instruments are "the set of techniques by which governmental authorities wield their power in attempting to ensure support and effect or prevent social change" (Vedung, 1998). Governments play a crucial role as policy-makers who use policy instruments. There are three types of public policy instruments: regulatory, economic and informational instruments (Bemelmans-Videc, 1998; de Bruijn and Hufen, 1998; Krott, 2005). In this research we added plan instruments according to the study by Park (2009: 38). **Regulatory instruments** comprise all those regulatory political interventions that formally influence social and economic action through binding 'regulations' (Krott, 2005). These instruments are the traditional instruments of the government to solve social and economic conflicts. They suggest norms and acceptable behavior and limit certain activities in a society (Lemaire, 1998).). Regulations refer to the term of rules, orders, directives, norms, standards, and statutory provisions of an obligatory nature, backed by negative or positive government sanctions (Vedung, 1998). Thus, they are described as "governments' stick" (Lemaire, 1998).

Economic instruments are all those political means of intervention that formally influence social or economic action through the exchange of "economic values" (Krott, 2005). Economic values constitute money, time, effort, services, and goods. The exchange of these values is subject to comprehensive regulation in the market economy. Economic instruments include cash transfers, cash grants, subsidies, reduced-interest loans, tax concessions (exemptions, write-off), loan insurance, crops and investments, government and private-sector provision of goods and services, vouchers, taxes, charges, fees, custom duties or tariffs (Park, 2009)

Informational instruments are all those political means of intervention that formally influence social and economic action solely through information (Krott, 2005). Such information includes the measures undertaken to influence the addressees through transfer of knowledge, communication of an argument, persuasion, advice, moral appeal and so on (Vedung, 1998).

Plan instruments are political mechanisms that aim to solve problems in landscape planning through innovative designs (Krumland, 2004; Park, 2009). As with regulatory instruments, politicians and administrations dominate these instruments. For example, at the national level, the government creates a national plan for improving energy efficiency.

4. Method

Our aim is to analyze eco-innovation policies in Asian countries. Seventeen countries with different stages of economic development according to the WEF (2013) in Asia were selected as target countries

(Table 2). Eco-innovation policies of each country were investigated. In this study eco-innovation policies include climate policies, energy policies, green technology policies and so on. For the analysis presented in this paper, documents such as plans, laws, policy reports and research articles on eco-innovation were collected and analyzed. Information on eco-innovation policies was categorized in relation to four types of public policy instruments (Table 3). In this research regulatory instruments include legislations and economic instruments include finance schemes referring to funds and grant programmes. Informational instruments include various types of network among actors and communication activities such as forums, conferences and exhibitions. Plan instruments include national plans, strategies, programmes and actions.

Table 2. Economic Development stages in the selected Asian countries

Stage	Name of Countries
1	Vietnam, Lao PDR, India, Pakistan, Cambodia, Bangladesh, Myanmar
1-2	Mongolia, Philippines, Brunei Darussalam
2	China, Thailand, Indonesia
2-3	Malaysia
3	Singapore, Japan, Korea

Source: WEF (2013)

Table 3. Types of policy instruments

Type	Contents
Regulatory instruments	Legislations: laws
Economic instruments	Finance: financial schemes
Informational instruments	Information and communication: network, forum, workshops etc.
Plan instruments	National plans, strategies, programmes and actions

5. Results

Eco-innovation policies were described with four types of public policy instruments; plan, regulatory, economic and informational instruments.

5.1. National plans and programmes

Each country has established national sustainable development strategy or national Agenda 21 (Table 4). Most of the selected countries initiated national plan for green growth and green innovation. However Mongolia, Philippines, Brunei Darussalam and Myanmar have not yet established the national plan relating to eco-innovation. Most of the target countries have conducted national programmes about innovative green technologies. The programmes mostly emphasize carbon reduction and renewable energy. Brunei Darussalam, Lao PDR, Cambodia, Bangladesh and Myanmar did not initiate national eco-innovation programmes. At the international level, 'Sustainable Product Innovation Project (SPIN)' as a SWITCH-Asia Programme by European Union has been conducted in

Lao PDR, Cambodia and Vietnam. SPIN contributed to improving innovative power of industry, targeting food processing, textiles, footwear, handicraft and furniture (EU, 2012).

Table 4. Plan instruments for eco-innovation

Economic Stage	Country	National plan and strategy		Programmes and actions	
		Sustainability	Eco-innovation	National	International
3	Singapore	■ Sustainable Singapore Blueprint 2009	■ Maritime Singapore Green Initiative	■ Green Ship Programme ■ Green Port Programme ■ Green Technology Programme	
	Japan	■ Japan's Strategy for a Sustainable Society (2007)	■ New growth strategy (2009-2010) ■ Green Innovation Strategy (2010) ■ Strategic Energy Plan (2010) ■ Third Science and Technology Basic Plan (2006-2010)	■ Top runner program ■ The Japan Environmental Technology Verification Programme (J-ETV) (2003) ■ Eco Leaf Program ■ Eco-Action 21 ■ Carbon Footprint Program ■ The Cool Earth Innovative ■ Energy Technology Programme (2008) ■ 3Rs (Reduce, Reuse, Recycle) Programme	
	Republic of Korea	■ Green Vision 21 (1996-2005) ■ National Action Plan for the implementation of Agenda 21 (1996) ■ State Environmental Mission for a New Millenium (2001)	■ Green growth strategy (2009-2050) ■ The Green New Deal (2009-2012) ■ National Energy Master Plan (2008) ■ The Five-Year Plan for Green Growth (2009-2013) ■ Ten-year Basic Plan for the Development and Dissemination of New and Renewable Technologies	■ Mandatory energy-efficiency standards and labeling (1992) ■ The high-efficiency appliance certification (1996) ■ Standby electricity reduction programme (1999) ■ GHG & Energy target management system (2010) ■ Carbon point scheme ■ Greening Cities project ■ Eco-city project and the Low carbon, Green Village project	
2-3	Malaysia	■ The 10th Malaysia Plan	■ Green Technology Master Plan 2030	■ Government Green Procurement program ■ Green TAG Endorse program Small Renewable Energy Programme (SREP)	
2	China	■ National Action 21 (1993)	■ Energy Saving and New Energy Vehicle Development Plan (2011-2020)	■ New and renewable energy development program (1996-2010) ■ Government energy efficiency programs (2006) ■ China Green tech Partner Program	

	Thailand		■ Thailand's green and inclusive innovation policy ■ Thailand 20-Year Energy Efficiency Development Plan (2011 - 2030) ■ Environmental Quality Management Plan (1999- 2006)	■ Carbon Reduction Labeling ■ Carbon Footprint Program	
	Indonesia	■ Vision 25/25	■ The 2005–2025 National Energy Policy Blueprint	■ Public Disclosure Pollution Control Program(PROPER) ■ Eco-industry program ■ Green Investment Program ■ Low Cost Green Car (LCGC) program	■ The APEC Policy Partnership on Science, Technology and Innovation (PPSTI) ■ Indonesia-Singapore Environmental Partnership (ISEP) (2002)
1-2	Mongolia	■ Mongolian National Sustainable Development Agenda (2005)		■ National Programme for Sustainable Development 2011	
	Philippines	■ Philippine Agenda 21 (1996)		■ National Energy Efficiency and Conservation Program	
	Brunei Darussalam	■ Wawasan Brunei 2035 (Vision Brunei 2035)			
1	Vietnam	■ Socio-economic development strategy for 1991-2000 ■ Strategic Orientation for Sustainable Development" (Vietnam Agenda 21) (2004)	■ National Green Growth Strategy for the period 2011-2020 with a vision to 2050(2013) ■ National Energy Master Plan	■ A Guideline for Energy Efficiency Standard and Labeling (2006) ■ The Vietnam Energy Efficiency and Cleaner Production (EECP) Financing Program ■ Vietnam Clean Production and Energy Efficiency Project ■ Vietnam Energy Efficiency Program (VNEEP) (2006)	■ Sustainable Product Innovation Project (SPIN)
	Lao PDR	■ Strategic Framework for National Sustainable Development Strategy 2008	■ Sustainable Transport Strategy 2020 ■ Renewable Energy Strategy to 2025 ■ Ecotourism Action Plan 2005-201		■ Sustainable Product Innovation Project (SPIN)
	India	■ Ninth Five-year Plan with SD recognized 1997-2002	■ Science, Technology and Innovation Policy 2013 ■ National biofuel policy (2008) ■ Strategic plan for	■ Performance Related Incentive Scheme	

			new and renewable energy sector (2011-2017)		
	Pakistan	■ National Sustainable Development Strategy (2012)	■ Alternative and Renewable Energy Policy 2011 Pakistan Energy Vision 2035	■ Pakistan Sustainable Transport Project (2011-2016)	
	Cambodia	■ National Strategic Development Plan (NDSP 2009 to 2013 update) 29)	■ The National Green Growth Roadmap (2009)		■ Sustainable Product Innovation Project (SPIN)
	Bangladesh	■ National Sustainable Development Strategy (2009)	■ National Environment Management Action Plan (NEMAP) (1995)		
	Myanmar	■ Myanmar Agenda 21 (1997)			

5.2. Legislation, Finance and Information

Each country established environmental laws including environmental protection laws (Table 5). In particular, Japan and Republic of Korea established laws for green purchasing, the Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services and Act on Promotion of Purchase of Green Products respectively. Philippines and China established Renewable Energy Laws.

All countries in the stage of 2, 2-3 and 3 initiated financial scheme for promoting green technology. Vietnam, Pakistan and Bangladesh in the stage 1 also established eco-innovation fund. In particular, the government of Bangladesh established the Climate Change Resilience Fund in May 2010. Denmark, European Union, Sweden, United Kingdom, Switzerland, Australia and United States provided financial support for the Fund.

Excluding Lao PDR and Brunei Darussalam, each country built network for green technology and green purchasing and held for exhibitions. Most countries took efforts to share knowledge on eco-innovation. International (bilateral and multilateral) workshops and forums on eco-innovation were held in several countries.

Table 5. Regulatory, economic and informational instruments for eco-innovation

Economic Stage	Country	Legislation	Finance	Information
3	Singapore	■ Environmental Protection and Management Act ■ Hazardous Waste Act 1998	■ Innovation for Environmental Sustainability Fund ■ 3R Fund	■ Green Pledge

	Japan	■ Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services (Green Purchasing Law) ■ Act on Special Measures Concerning Procurement of Renewable Electric Energy Operators of Electric Utilities (2012)	■ Environment research and technology development fund	■ Water Environment Partnership in Asia (2003) ■ Asia-Pacific Regional Inception Workshop on Environmentally Sound Management of Electronic and Electrical Wastes (2005) ■ Eco Mark Program & Global Eco-labeling Network ■ Green purchasing network ■ Regional Innovation Cluster Programme ■ Keidanren voluntary action plan
	Republic of Korea	■ Act on Promotion of Purchase of Green Products (2005) ■ Framework Act and Low Carbon and Green Growth (2010) ■ Act on the Allocation and Trading of Greenhouse-Gas Emission Permits (2012)	■ Environmental Improvement Fund ■ Recycling Industry Promoting Fund	■ The "Seoul Initiative Network on Green Growth" (2005) ■ Local Green Networks ■ Green Technology Network(GTNET) (2009) ■ East Asia Climate Partnership (2008)
2-3	Malaysia	■ Environmental Quality Act 1974 ■ Renewable Energy Act 2011	■ Green technology financing scheme Renewable Energy Fund	■ The Malaysia-Europe Forum (MEF) ■ Roundtable Series on Sustainability: 'Future Cities – Urban Mobility'
2	China	■ Renewable Energy Law (2005) ■ Energy Conservation Law	■ China CDM Fund ■ Mobilizing financing from national new products program & national key technologies R&D program ■ National Key Laboratories Programmes-Public investment in environmental R&D	■ The Regional Inclusive Innovation Policy Forum (2012) ■ China-Japan-US Forum on Sustainable Built Environment (CJUFSBE) ■ The 30th Meeting of APECSMEWG (Small and Medium Enterprises Working Group) (2010) ■ The 6th China International Energy Saving and New Energy Vehicle Technology Exhibition (EVCHINA 2014)
	Thailand	■ Enhancement and Conservation of National Environmental Quality Act (1975)	■ Energy Conservation Promotion Fund (ECPF)	■ Thailand Business Council for Sustainable Development ■ The 9th Sustainable Energy and Environment Forum (SEE Forum) 2012 ■ Thailand country development partnership-environment (2004) ■ Science and Innovation for Sustainable Development Forum ■ A Quest for Sustainable Development: Goals for Asia and Europe (Asia-Pacific Ministerial Dialogue) (2013) ■ The Fifth Regional Environmentally Sustainable Transport (EST) Forum in

				Asia (2010) ■ Pilot project on waste exchange programs
	Indonesia	■ Law No. 32/2009 on Environmental Protection and Management	■ Eco-industry program ■ Green Investment Program ■ Environmental Soft Loans(for SMEs) ■ The Indonesia Climate Change Trust Fund	■ BAPEDAL Regional Network Project (1996~2005) ■ 7th Regional Environmentally Sustainable Transport(EST) Forum
1-2	Mongolia	■ Environmental Protection Law (1995)	■ GEF Small Grants Programme	■ National forum "Sustainable development and environ- mental governance" (2012) ■ National Forum on Green Development ■ "World Clean Coal 2014 ″ conference ■ National Committee for reducing air pollution ■ Consultation "Implementation Status of Agenda 21 for sustainable education (MNET and UNDP)" 2012
	Philippines	■ Biofuels Act (2006) ■ Renewable Energy Act (2008)	■ Philippines Sustainable Energy Finance Program ■ Sustainable Entrepreneurship Enhancement and Development Program(SEED) ■ Clean Technology Fund Investment Plan for the Philippines	■ Sub-regional Conference on Waste water Management: Promoting Innovations and Sustainable Investments (2013) ■ The Asia Low Emission Development Strategies (LEDS)Forum (2013) ■ Philippines sustainable development network (PSDN)
	Brunei Darussalam	-		
1	Vietnam	■ Environmental Protection Law (2005)	■ The Vietnam Energy Efficiency and Cleaner Production (EECP) Financing Program	■ 15th Forum on Eco-innovation: ECUNEP ■ Roundtable on Eco-innovation (2013) ■ Green Innovation Forum–Energy Efficiency and Renewable Energy (2011)
	Lao PDR	■ Environmental Protection Law (1999)		
	India	■ National Green Tribunal Act (NGT) ■ Environmental compliance program		■ Environmental Information System

	Pakistan	■ The Pakistan Environmental Protection Act 1997	■ Provincial Sustainable Development Funds (PSDFs) 2011	■ Sustainable Development Conferences (SDCs) ■ Pakistan Sustainability Network ■ Pathways to Resilience in Semi-Arid Economies (PRISE) 2014-2018 ■ Sustainable Ship-breaking Initiative (SSI) for Trade and Sustainability in Ship-breaking Industry of Pakistan 2011-2016 ■ Secure Livelihoods Research Consortium (SLRC) 2011-2017 ■ The Centre for Capacity Building [CCB]
	Cambodia	■ Law on Environmental Protection and Natural Resource Management (1996)		■ Community Based Natural Resource Management (CBNRM) Emerging Trends, Challenges and Innovations (2009) ■ The 1st National Consultative workshop on drafting the National Policy on Science and Technology(NPSTI) organized by The Cambodian National Committee on Science and Technology(NCOST) and UNESCO ■ Fostering policies and capacity building in science, technology and innovation for sustainable development ■ TT-Pilot (GEF-4): Climate Change Related Technology Transfer for Cambodia: Using Agricultural Residue Biomass for Sustainable Energy Solutions
	Bangladesh	■ Bangladesh Climate Change Trust Fund Act (2010)	■ The Clean Technology Fund Bangladesh Climate Change Resilience Fund (2010)	■ A seminar entitled "Opportunities for UK-Bangladesh Business Collaborations for Environmental Sustainability and Resource Efficiency" ■ Sustainable agri business supply chain workshop (2013) ■ Jointly arranged to broker supply chain partnerships between companies and NGOs who are directly involved in agri business value chains
	Myanmar	■ Natural Environmental Framework Legislation		■ ESCAP-Myanmar Partnership ■ Sustainable Business Myanmar ■ Myanmar Green Economy Green Growth Forum (2011~.annually) ■ A pilot Resource Efficient and Cleaner Production (RECP) programme in Myanmar ■ Myanmar Green Energy Summit 2014 ■ Renewable Energy Association Myanmar (REAM) (1993)

6. Discussion and Conclusion

In this research, eco-innovation policies in 17 Asian countries were elucidated with types of policy instruments and economic development stages. Each country group by development stages displays different institutional approaches to eco-innovation. In the countries with the stages 1 and 1-2

(transition countries from stage 1 to 2), eco-innovation policies are being developed as part of sustainable development visions and strategies. Some of these groups receive international supports to promote national visions and plans for sustainable development through the international environmental projects and programmes. Specifically, financial aid programmes and capacity building projects have been implemented in the countries with stages 1 and 1-2. Especially SPIN as a programme for eco-innovation was implemented for building an enabling environment for eco-innovation in Cambodia, Lao PDR and Vietnam. In particular, Lao PDR and Brunei Darussalam lack specific regulations, funds and information sharing activities on eco-innovation.

The countries with both stages 2 and 2-3 (transition countries from stage 2 to 3) established and implemented national visions and plans for eco-innovation as well as developed specific eco-innovation policy instruments. They carried out various forums and meeting with other countries and international organizations. Especially they targeted the energy sector. Malaysia and China established and implemented Renewable Energy Acts. The countries with the stage 3promoted eco-innovation based on the high levels of economic and technological development. They established the long-term objectives related to eco-innovation and various policy instruments for achieving sustainable development. These countries do not depend on international aids, but instead donate aid to promote eco-innovation in other Asian countries. They established and implemented specific policies to introduce green markets.

This research indicates the different approaches to eco-innovation in Asian countries. However, this research has some limitations in terms of data collection and interpretation. To analyze eco-innovation policies in the selected Asian countries, we depended primarily on data written by English. Due to lack of data, we could not conduct an in-depth analysis of eco-innovation policy, although we used multiple data sources (e.g., research articles, reports and internet homepages). In future study, case studies on eco-innovation should be conducted through collaboration with local experts. Despite these data challenges, this research offers insights to designing national strategies for eco-innovation in Asia's developing countries. Therefore it can contribute to facilitating and diffusing eco-innovation toward sustainability in Asia.

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Author Contributions

The manuscript was written collaboratively by Eun Kyung Jang and Mi Sun Park. Tae Woo Roh and Ki Joo Han, contributed to designing the research and interpreting results. Jang Whan Jo and Seong Hoon Kim collected data.

Conflicts of Interest

The authors declare no conflict of interest.

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Appendix 1. List of Documents

Country	Reference
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