sustainability

MDPI

Article

Toward a Theoretical Framework for Studying Climate Change Policies: Insights from the Case Study of Singapore

Ai Sian Ng *, May O. Lwin and Augustine Pang

Nanyang Technological University, Wee Kim Wee School of Communication and Information, 31 Nanyang Link, WKWSCI Building, Singapore 637718, Singapore; TMAYLWIN@ntu.edu.sg (M.O.L.); AUGUSTINE.PANG@ntu.edu.sg (A.P.)

* Correspondence: ng0030an@ntu.edu.sg; Tel.: +65-9772-1132

Received: 30 April 2017; Accepted: 28 June 2017; Published: 4 July 2017

Abstract: The world decided in December 2015 to take actions to reduce global warming. To contribute toward this goal, this research examines possible policy levers for inclusion in the climate change ratification plan. A case study of the measures taken by the Republic of Singapore, a low-lying 719.2 km^2 island without natural resources in Asia, is conducted. Being vulnerable to climate change impact and yet having to balance her people's needs and economic progress with limited resources, the measures taken by this small country could offer policy insights for small states and states without access to alternative energy sources. This research analyzes the online policy documents posted by eleven organizations to answer the main research question of identifying policy levers as theoretical constructs to form a framework that can be used to study climate change policies. A qualitative data analysis software, QSR NVivo 10, is used to classify the proposed nodes developed by the researchers using a system perspective integrating the insights from the key international climate change frameworks with the theoretical concepts from the model of pro-environmental behavior. The findings can offer insights toward developing a new contextual influence framework, which can help strengthen policy development and outcome measurement.

Keywords: climate change policies; contextual influence framework; model of pro-environmental behavior; document analysis; thematic analysis; Singapore; Asia

1. Introduction

Devastating climate change effects are increasingly experienced globally, altering our living environments and threatening our livelihoods. The Paris climate accord was agreed at the United Nations meeting in December 2015 as mankind's solution to address the climate change effects [1]. However, the accord could only take effect in 2020 if the targeted number of countries contributes ratification plans that could achieve the targeted reduction in greenhouse gas emissions.

While countries are building consensus on the type of impactful policy measures to implement in their respective countries and to collaborate on international platforms, the world has been experiencing frequent extreme environmental conditions. The year of the Paris agreement witnessed severe environmental disasters [2]. That year was also reported to record the highest temperature during the 1880–2015 period [3]. According to the World Meteorological Organization [4], the human activities that brought harm to the Earth and strong El Niño effects could have aggravated the climate change effects in 2015. The increase in the severity and frequency of climate change disasters could attest to the urgency for all countries to step up their mitigation efforts.

However, global efforts in forging an agreement to the Paris climate accord was disrupted when the current President of the United States of America signed the executive order in March 2017 to

undo the previous government's climate change plan [5,6] and announced in June 2017 to pull out his country of this accord [7,8]. Concerns had been expressed over the continual emission by this world's second most polluting country and the possible signal from this move for others to disregard the call to cut global emissions [9]. However, this move could have united the rest of the world to journey on [10,11]. China was reported to step up efforts with the European Union on clean energy development [11,12]. Internally within the United States of America, there could be ground-up support from local governments and commercial organizations to continue with their efforts to contribute to global emission cuts [13–16]. The ability of other governments to rally and put together effective ratification plans, coupled with people's receptivity of the formulated plans and the autonomous actions from corporations and individuals can become critical to minimize the impact of this setback and work toward the success of the Paris climate deal in addressing the escalating harsh climate change effects.

To contribute toward such efforts, this research seeks to build a new theoretical framework that could facilitate international comparison of climate change policies. Adopting a system perspective [17,18], the proposed framework integrates insights from the key international climate change frameworks [19–24] with theoretical concepts anchored on the model of pro-environmental behavior [25]. This integrated contextual influence approach is useful for international comparison of the different climate change initiatives currently being implemented and measurement of outcomes so that more could be done within the limited time frame to mitigate the current climate changes effects. Figure 1 illustrates the proposed contextual influence framework.

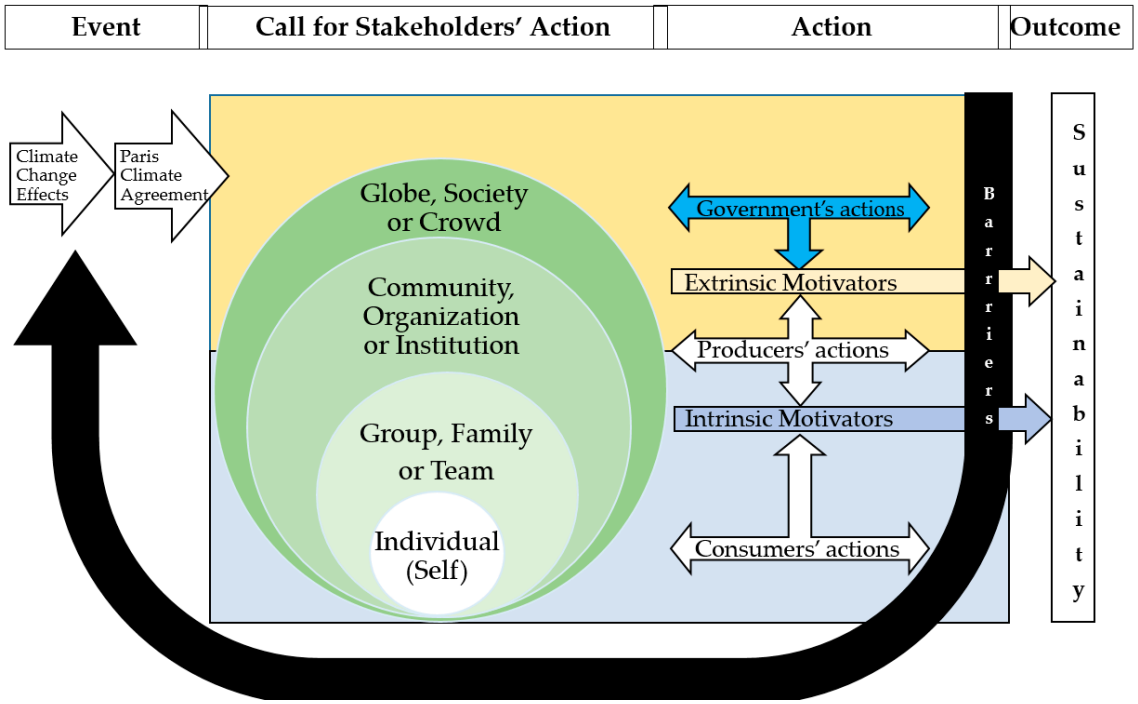

Figure 1. Contextual influence framework.

Adopting the premise of causality between climate change and human actions, the proposed conceptual framework posits that the stakeholders at various levels starting from the micro level of individuals to the global and societal level will take actions toward environmental sustainability in response to the rapidly deteriorating climate change effects. This collective response had culminated in the Paris climate agreement.

The government as an influencing stakeholder in the current climate change mitigation efforts was the selected focus of this case study as this is the time when the governments over the world

are drawing up their national ratification plans to achieve the targeted reduction in greenhouse gas emissions. It is thus timely to start the framework development focusing on this stakeholder so that a framework for international studies of climate change policies could be developed. The current forces at play in the United States, where national policies and local efforts are driven by different agendas, could be an example illustrating the significance of understanding the motivators at the different levels [13–16]. Future studies could be conducted to probe on the impact of the extrinsic influences introduced by the government policies on the producers and individual consumers and the intrinsic influences arising from the policy users' inner motivators.

To develop this framework, document analyses of environmental sustainability policy instruments introduced in the Republic of Singapore were conducted to establish the presence of policy levers explicated using the constructs from key international climate change frameworks and the model of pro-environmental behavior. Pilot thematic analyses of online materials posted by eleven organizations using QSR NVivo 10, a qualitative data analysis software, suggested support for the hypothesized nodes, thereby contributing theoretical constructs toward building the foundation of the contextual influence framework. Insights from this case study further offered an Asian perspective on current literature on climate change policies and environmental sustainability.

2. Research Gaps and Contributions

This research adopted an ecosystem perspective to gain a deeper understanding of the effects of the government as an influencing stakeholder on the multiple stakeholders shown in Figure 1. In adopting such an approach for this study, the researchers aim to build the extrinsic layer of the contextual influence framework to deepen current knowledge of universal extrinsic factors driving behavioral and organizational changes toward environmental sustainability.

Environmental sustainability policies are premised on the assumption of rational behaviors from people [26]. However, contextual and intrinsic factors could alter the policy outcome premised on rational reaction to policy measures. Furthermore, initiatives targeted at increasing awareness and achieving behavioral changes toward environmental sustainability require continuous feedback and refinement before the desired outcomes in lifestyle changes could be achieved [27].

However, there could be the limited consideration in current studies of syndetic influences on behavioral antecedents originating from international and national policy initiatives. Studies on pro-environmental behaviors focused on reactive post-consumption behaviors, such as recycling instead of the larger problem of accelerating population growth and spiraling consumption [28]. Current focus could also be inferred to be validating factors at a single level, looking at macro, mesa or micro level behavioral antecedents [29] and theoretical constructs as behavioral antecedents [30–32]. It has thus become critical to embark on this research to understand and unravel systematically the influences introduced by the government through their climate change policies on the implementing contexts which could affect the final outcome of climate change policy initiatives.

Another contribution of this study is an Asian perspective on environmental sustainability studies. Such a perspective has gained grave importance as Asia faces more climate change catastrophes. In addition, the case study anchored on a city state in Asia can add insights on the possible mitigation approach to address the climate change effects arising from rapid city development and urbanization in Asia which could have exacerbated environmental disasters [33].

Furthermore, Asia has integrated into global supply and value chain, accountable to investors and customers all over the globe [34]. The Asian perspective contributed by this study could add insights to the current literature to support the multinational corporations plan their corporate social responsibility activities in Asia. In addition, China is reported to be positioning herself to lead in climate change efforts and her actions would affect Asia and the rest of the world [35–38]. An understanding of Asian climate change policies could provide local and regional reference for international organizations to adapt their global assistance programs to better meet local needs and work toward building local resilience.

3. Theoretical Framework

This pilot case study is undertaken to identify the extrinsic drivers inherent in the international and national levels of the overarching framework in Figure 1. The approach taken to start the framework development by focusing on the government as an influencing stakeholder recognizes that the government can play either a catalytic or a restrictive role in enabling pro-environmental behavior of the companies and individual consumers. Scholars have explicated the influences of government in facilitating environmental sustainability using concepts such as infrastructures of provision approach [39] and the adapted systems concept [40]. People could be "caught structurally" [41] (p. 503) in the way they could live their lives.

The breakthroughs or barriers in changing one's lifestyle to embrace environmental sustainability could be explained using the theoretical concepts posited in the model of pro-environmental behavior. This model is selected to anchor the study due to its similarity with the system perspectives adopted by international organizations and academia in approaching environmental sustainability studies. In addition, its broad classification of external factors is useful to frame this research as it allows systematic categorization of contextual policy-related factors.

During the thematic analyses of the pilot study datasets, this case study focused on identifying three groups of external factors adapted from the model of pro-environmental behavior as governmental policy factors and key international climate change frameworks. The researchers further explicated the theoretical constructs from this model using sub-themes that surfaced during the thematic coding:

a. Infrastructure

This is one of the institutional factors listed in the model and argued to be a fundamental condition for pro-environmental behaviors as Kollmuss and Agyeman [25] contended that "many pro-environmental behaviors can only take place if the necessary infrastructure is provided (e.g., recycling, taking public transportation)" (p. 248).

Empirical studies conducted by the Organization for Economic Co-operation and Development have established the important role played by the government in influencing pro-environmental behaviors through their provision of accessible environmental related infrastructure and services [42]. The absence or inadequacy of such provision could deter people from going green [43].

In this study, the researchers grouped the datasets inferred to depict the infrastructure construct based on the policy category which surfaced during the coding. Examples of such policy category comprised building, clean air, energy, finance, transport, water, 3R and other mitigation and adaptation. Sub-themes that surfaced as manifestation arising from the implementation of infrastructural provision were also coded. They included constructs such as innovation, central planning and leadership as well as green spaces and biodiversity.

b. Political

In the context of government influence on pro-environmental behavior, political drivers could draw from the legal framework that enforces or encourages certain behaviors. One such international legal provision is the United Nations Framework Convention on Climate Change requirement for the developed countries participating in the framework to set up regulations to minimize their greenhouse gas emissions [20]. The use of laws involves setting up regulations to directly influence the type of products finally manufactured or made available for consumption. To illustrate, the government could regulate producers to make products that fit certain energy efficiency standards. Such legal instruments are found in studies to have effects on shaping the behaviors of the individual consumers who could otherwise not find the efforts worthwhile [44,45].

In this study, the researchers selected legislation to represent the political factor posited in the model of pro-environmental behavior. The researchers similarly grouped the datasets inferred to depict

the legislation construct based on the policy category which surfaced during the coding. Examples of such policy category consisted of building, clean air, consumer products, energy, finance, transport and water. Additionally, sub-themes were coded to contribute to the construct explication. The sub-themes included enforcement, green spaces and biodiversity as well as international agreement.

c. Economic factors

The model of pro-environmental behavior groups economic incentives and income level as economic factors. The Organization for Economic Co-operation and Development has defined the policy levers in this category as "economic instruments" [42] (p. 28) and included in this category different economic intervention tools such as grants and charges. Economic incentives, such as subsidies, encourage pro-environmental behavior by defraying the costs of taking up the behavior while economic dis-incentives, such as taxes, deter the current behavior by adding to the cost of the behavior. However, people could resist change if they become accustomed to the economic levers or form habits which are resistant to economic levers [46].

A study conducted by the Organization for Economic Co-operation and Development in 2011 found that the use of energy efficient appliances to improve household energy efficiency could be greatly encouraged with the government support [42]. The 2011 study also found that consumption could increase from availability of subsidized, less environmentally damaging products, such as electric cars, which could arise from unintended rebound effects [47–49].

In this study, the researchers focused on identifying subsidies and tax as separate constructs when analyzing the online documents as they were economic instruments widely in use as separate levers to either encourage or discourage the behaviors. Subsidies surfaced as themes for 3R, building, energy, transport and water policy categories while tax surfaced as themes for 3R, carbon, transport and water policy categories. Fine was added as a sub-theme under tax as it imposes financial burden on the policy user if they choose to carry out the behavior. This is similar in intended policy effect as the tax which is to make the cost of behavior adoption prohibitive.

While the use of such levers could have an impact on encouraging and shaping the behavior, their effectiveness is premised on the assumption of rational behaviors from the people and could also be affected by "social, infrastructural, and psychological factors" [25] (p. 249).

To expand the theoretical framework beyond the broad classification of external factors stated in the model of pro-environmental behavior, additional constructs were identified during the review of empirical and scholarly literature with the objective of adding an upstream intervention approach. Government's efforts to put in place the environmental sustainability policies and provision could otherwise become futile if no one knows about them [50]. An upstream intervention approach could help to overcome this gap and minimize the impact of future actions on the environment resulting from current actions. From a communication angle, information, campaigns and educational programs targeted at the individual consumers could play an equally pivotal role as infrastructural provision, legislation and economic instruments in cultivating current behavior to form future environmentally sustainable habits and lifestyles. Furthermore, the environmental impact of a product and/or service is predetermined at the product design stage at a significant range of 30% to 80% [51]. However, most of the designs we are using now are developed during the era when sustainability was not the key design consideration [52]. Upstream intervention constructs thus play an important a role in minimizing the environmental impact of our actions and enabling environmental sustainability. Hence, the theoretical construct of design for sustainability is proposed as an added construct in the theoretical model for studying climate change policies.

The four new proposed constructs could be explicated as follows:

a. Information

Consumer information is included as one of the initial programs of the ten-year framework of programs on sustainable consumption and production endorsed by the United Nations at

its Conference on Sustainable Development (Rio + 20) in June 2012 [53]. Unlike legislation, information-based instruments indirectly influence consumption by allowing consumers to make informed procurement choices such as through the use of energy efficiency labels.

Studies have indicated mixed results of information tools such as eco-labeling on environmentally sustainable behaviors. For Osbaldiston and Schott [28], information tool could serve two purposes: (a) "justifications" [28] (p. 272) which explain the reason for the action and (b) "instructions" [28] (p. 272) which explain the steps to be taken to complete the action. In addition, people may prefer to receive information on the labels so they can understand and read new eco-labels such as carbon labeling [54,55]. Such preference implies that information tools other than the labels are needed to enable people to make informed decisions.

To suggest possible information avenues to enable informed decisions, this study has attempted to identify the different types of information tools being adopted in the research site other than eco-label certification or award. Sub-themes that surfaced as manifestation arising from the use of information policy were coded. They included sub-themes such as certification or award, checklist or guidelines, event, media replies and coverage, parliament replies and discussion, press release, public diplomacy, publication, speeches and studies.

b. Campaigns

In the National Communications submitted to the United Nations Framework Convention on Climate Change in 2014, countries reported on cooperation on education, training and public awareness to raise awareness of climate issues [56]. The importance of creating public awareness has been found in the Global Survey on Sustainable Lifestyles conducted by United Nations Environment Program in 2011 to understand the varied sentiments of youth today as well as their vision and hopes for tomorrow [57]. The survey findings reported 65.2% of participants giving feedback about not being informed about their local action plans while receiving information on global actions. This suggested possible gap in relating global challenges and vision to individual's actions.

To bridge this information gap, more efforts could be taken during the youth's formative years in school as part of national campaigns. As a result, campaigns are proposed as a coding category, separate from information tools as well as education. The researchers also grouped the datasets inferred to depict this construct based on the policy category which surfaced during the coding. Examples of such policy category included building, clean air, energy, transport and water. Green spaces and biodiversity also emerged as a sub-theme.

c. Education

Education on climate change had been included in the National Communications submitted by developed nations Parties in 2014 as an important mitigation action taken [56]. The United Nations Environment Program also emphasized education as a key lever to change current mindsets toward environmentally sustainable consumption behaviors and to empower sustainable consumption decisions [57].

Studies have shown that imparting of skills and gaining of knowledge could enable pro-environmental behavior [58,59]. One's educational institution can shape one's outlook toward environmental sustainability too [60].

In this study, the researchers similarly grouped the datasets inferred to depict educational activities carried out to impart knowledge and skills based on the policy category that surfaced during the coding. Examples of such policy category covered the areas of 3R, building, clean air, energy, transport and water. The sub-themes included green spaces and biodiversity as well as master planning and development.

d. Design for sustainability

Design for sustainability could be viewed as innovative transformation, looking at both technical and social elements of the product as well as the global impact through the life span of the product. To achieve the outcome of sustainability, the designer will start the design process by questioning the need for the product and exploring if its use could be met using alternatives before commencing on the product design [61].

At the international level, the United Nations Environment Program recognizes the significance of covering the entire value chain, from the start of product design to final disposal, to address environmental sustainability issues. The United Nations Environment Program examines policy framework, technological and social innovation, market forces as well as people's values and lifestyles for their influence on sustainable consumption and production using the life-cycle approach [62]. The United Nations Environment Program also includes Sustainable Public Procurement Program, which was introduced in 2014 [63].

Recent research shows the increasing influence of this variable. The surge in awareness of climate change has led to increasing emphasis at the construction project design and execution state to incorporate green features to minimize the impact of the construction process and final building structure on the environment [64].

In this study, the construct of design for sustainability is explicated further to include sub-themes that surfaced during the coding. Green procurement was one such sub-theme.

4. Materials and Methods

4.1. Site Selection

The Republic of Singapore was selected as the pilot research site, as the researchers considered her status as an early contributor to international climate change efforts and her constraints faced as a low-lying small island state without natural resources and limited access to renewable energy. The Republic had communicated to the United Nations Framework Convention on Climate Change her pledge to cut her emissions intensity by 36% from 2005 levels by 2030, and to peak her emissions around 2030 for stability thereafter [65]. The Republic highlighted, in her intended nationally determined contribution report, her vulnerability and challenges in providing for her economic and residential needs for the people living on the small island. The measures taken by this small country in Asia could thus offer useful insights for other nations facing similar constraints and challenges when embarking on climate change mitigation efforts.

4.2. Document Analyses

The Internet has been a valuable and established document source [66–68]. Online environmental sustainability policy documents constituted the sole source of information used for the pilot document analyses. The data corpus was identified by examining the online documents posted by the central climate change coordinating organization to identify the partnering organizations involved in the implementation of the climate change policies. The eleven organizations listed in Table 1 were selected for the pilot study as their roles in current climate change efforts could offer insights to other countries facing similar challenges in urban development and managing limited water and energy resources.

Acknowledging the possibility of differences in approaches in implementing climate change policies, online policy documents from both government and non-governmental organizations were selected for the pilot coding by three coders, comprising the first author as the lead coder and two undergraduates. Each of these organization websites was studied to sieve out the relevant dataset to build the extrinsic influence layer of the proposed theoretical framework. The materials posted as web pages were retrieved and pasted on word documents, which were systematically labeled by batches and organization name for thematic analyses. Eleven documents, which were posted online in portable document formats, were also downloaded and added to the relevant batches. All the materials for

each organization were collated for coding as one QSR Nvivo project. All the individual QSR Nvivo projects were merged for analyses.

Table 1. List of organizations selected for the pilot thematic analyses.

Organizations Selected for Pilot Coding	Roles in Current Efforts
Government Organization	
National Climate Change Secretariat	Coordinating agency in climate change efforts
Ministry of the Environment and Water Resources (MEWR)	Ministry overseeing environmental and water resource issues
National Environment Agency	Agency set up by MEWR to implement environmental policies
PUB	Agency set up by MEWR to implement water resource policies
Energy Market Authority	Agency overseeing policies pertaining to energy provision and services
Urban Redevelopment Authority	Agency overseeing urban development blueprint, land use planning and conservation
Centre for Liveable Cities Singapore	Agency developing livability framework and knowledge
National Parks Board	Agency overseeing greenery provision and enhancement
Non-Governmental Organization	
Singapore Environment Council	Agency working on achieving environmental sustainability through programs such as awards and eco-labeling
Singapore Green Building Council	Agency working on green building product and green building services labeling program and Singapore's representative on the World Green Building Council
Global Compact Network Singapore	Agency promoting corporate social responsibilities and facilitating companies to operate in accordance to strategies with United Nations Global Compact principles at the country level

4.3. Thematic Analyses

Thematic analysis was applied to code each project. Thematic analysis refers to a research analysis process of "identifying, analysing and reporting patterns (themes) within data" [69] (p. 79). In thematic analysis, the researcher has to create nodes by defining and refining what he or she sees in the textual data, contributing to each node. This method of data analysis is useful to identify patterns that emerge from the data and add to the understanding of the phenomenon [70]. Hence, thematic analysis was selected as the data analysis method in the exploratory state of framework development, as it allowed the researchers to establish the presence of the universal policy levers and classify local policy levers as well as sub-themes that could surface as local explication of the theoretical constructs.

The coders followed the following process in conducting thematic analysis. A preliminary codebook, with the explanation of each theme or node, was developed to guide the coding of the datasets by three coders using a qualitative research analysis software, QSR NVivo 10. The nodes listed in the preliminary codebook were first added to set up the QSR NVivo project. They started coding by reading through each document to gain a feel of the data before proposing and agreeing on the suitable theme for each data. They discussed, reviewed and refined the themes at the start of and throughout the coding. When any text did not fit existing nodes, they discussed about a possible new node that could fit the text. When they agreed on the appropriate new theme or node, they included the theme in the codebook and the node to the QSR NVivo project.

This process of discussion during coding is aligned to the suggestion by Basit [71], which helps to reduce, compress, separate and categorize textual and unstructured qualitative datasets. The coders commenced individual coding after establishing minimum inter-coder reliability with 0.88 on the

average [72]. A QSR NVivo project file was created for each organization. All the individual QSR NVivo project files were merged for final analysis by the lead coder.

The lead coder looked across the datasets and organized the findings into common themes, based on their prevalence [69]. The lead coder further collated the sub-themes to identify emerging patterns that could further explain the operationalization of the policy levers in use. Such an approach is useful in drawing out the emerging and repeated patterns in rich details from the data [73–75]. Such an understanding guided the researchers in the early stage of framework development, particularly in explicating proposed constructs in the framework.

5. Results

5.1. Overview of Pilot Coding Findings

The lead coder generated the word clouds from the datasets of the government organization and from the non-government organization datasets. The word clouds serve as useful visual presentation of words frequently used in the documents, with those most in use having larger font sizes [76–78]. The word cloud generated from the government organizations' datasets in Figure 2a suggested that room, electricity, energy and water could have been high on the government's agenda while those generated from the non-government organizations' datasets in Figure 2b indicated that green, building, construction and sustainability could probably be high on their agenda.

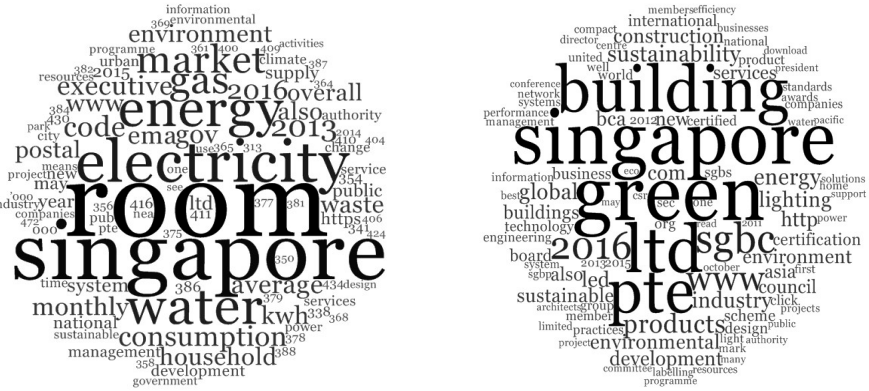

Figure 2. (**a**) This is the word cloud generated from the government organizations' datasets. (**b**) This is the word cloud generated from the non-government organizations' datasets.

Table 2 provides the breakdown of the nodes which had been used by the coders to classify the datasets. The findings in Table 2 suggested support for the theoretical concepts adapted from the model of pro-environmental behavior and international frameworks in classifying climate change policies implemented by both government and non-governmental organizations. The construct of infrastructure was most frequently used to code both datasets. One third of the total number of references was coded using the node of infrastructure. This could suggest that the nation undertook extensive efforts to mitigate climate change effects through infrastructural development to overcome its natural physical constraints. However, the construct of tax did not surface as prominently in this exploratory study.

Table 2. Total number of references.

Theoretical Constructs	Total Number of References (%)		
	Government Organizations	Non-Governmental Organizations	Total
Infrastructure	1980 (34%)	283 (28%)	2263 (33%)
Legislation	516 (9%)	58 (6%)	574 (8%)
Subsidies	125 (2%)	11 (1%)	136 (2%)
Tax	25 (0%)	2 (0%)	27 (0%)
Information	1326 (23%)	306 (30%)	1632 (24%)
Campaign	87 (1%)	13 (1%)	100 (1%)
Education	816 (14%)	162 (16%)	978 (14%)
Design for Sustainability	935 (16%)	181 (18%)	1116 (16%)

The findings also suggested support for the proposed constructs added in this study to provide an upstream intervention perspective. Nearly one quarter of the total number of references was coded using the node of information. The datasets from both government and non-governmental organizations were skewed more to the use of information, followed by design for sustainability.

5.2. Theoretical Constructs from the Model of Pro-Environmental Behavior

The thematic analyses of the pilot study datasets suggested the presence of the proposed constructs adapted from the model of pro-environmental behavior and key international climate change frameworks as policy factors constituting government's actions in the contextual influence framework. Sub-themes also emerged during the coding.

The findings in Figure 3 suggested support of the first construct, infrastructure. Central planning and leadership surfaced as one possible explication of the infrastructure construct. Two other sub-themes, innovation as well as green spaces and biodiversity were correspondingly inferred to be part of the intended infrastructural policy deliverables when the government in the Republic of Singapore implemented her national climate change policies. Other mitigation and adaptation measures also surfaced as a sub-theme.

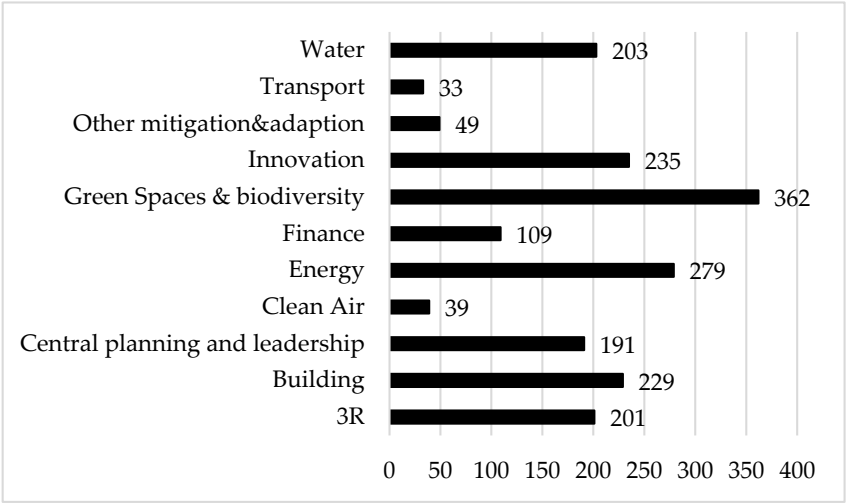

Figure 3. Total number of references in government organization datasets for the construct of infrastructure.

The findings in Figure 4 suggested support of the second construct, legislation. This construct could be inferred to apply in the infrastructural provision of water, transport, energy, clean air, building and 3R policy categories. Its application could also be extended to consumer products. In terms of form, the coders found international agreement and enforcement as sub-themes depicting the legislation

construct application in the Republic of Singapore. Two other sub-themes, innovation as well as green spaces and biodiversity, were inferred to be part of the intended legislative policy deliverables in the Republic of Singapore.

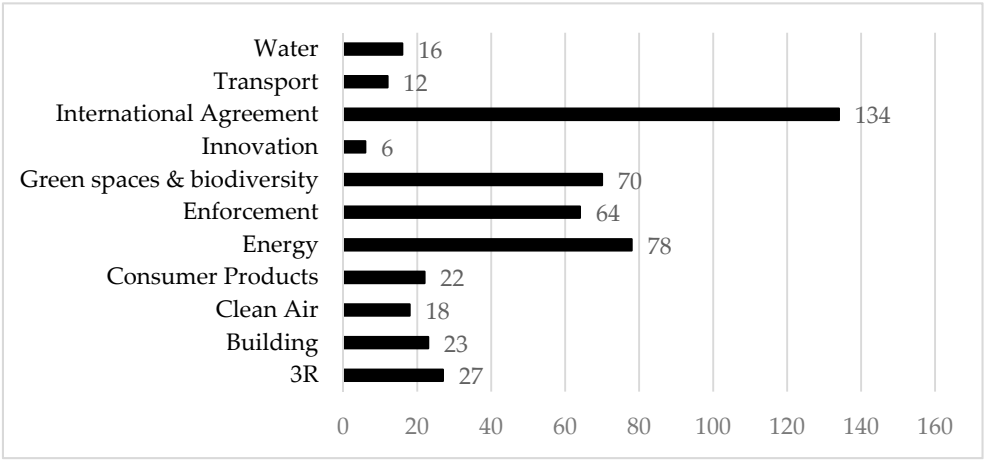

Figure 4. Total number of references in government organization datasets for the construct of legislation.

The findings in Figure 5 suggested some support of the third construct, economic factors. While the provision of building, energy, transport, water and 3R could have leveraged the use of subsidies, taxes could be inferred to be added to the provision of transport, water and 3R, likely with the intent to deter excessive consumption behaviors. Fine and carbon tax were two other nodes which the coders had inferred from the datasets during their coding.

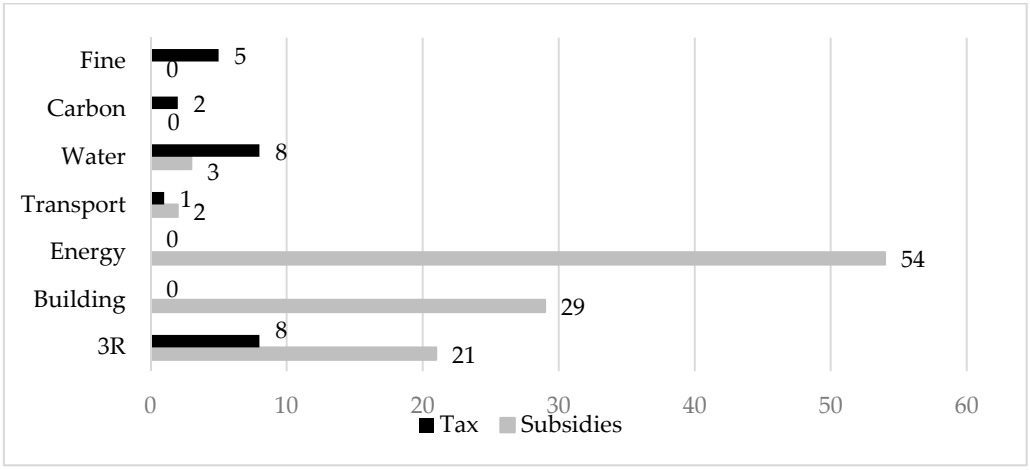

Figure 5. Total number of references in government organization datasets for the construct of economic factors.

5.3. Added Theoretical Constructs

The thematic analyses of the pilot study datasets also suggested support for three of the four added theoretical constructs which the researchers proposed to incorporate in the model to inject an upstream intervention approach.

Figure 6 shows the total number of references for the added construct, information. The coders inferred a range of information tools being applied in Singapore when implementing climate change policies. The pilot findings also suggested difference in the approaches taken by both types of

organizations in implementing the information policies. The government organizations could be inferred to emphasize on active international and local engagement through public diplomacy and building consensus through events, media replies and raising the issues in the Parliament. The non-government organizations could be inferred to be mission driven when they used information tools such as events and certification or award to support their mission statements.

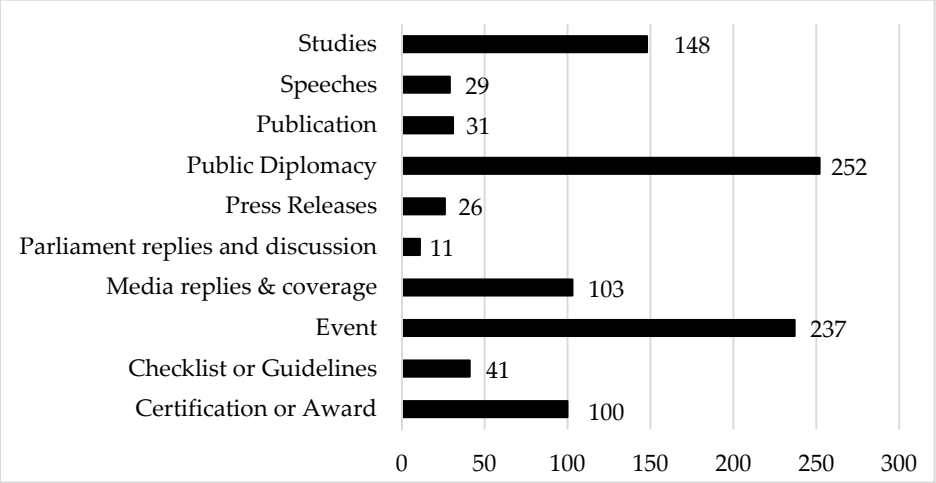

Figure 6. Total number of references in government organization datasets for the information construct.

The second added construct, campaign, did not surface as significantly in this exploratory study. While this could be due to the contextual receptivity of other international and national policy levers in the Republic of Singapore, further studies could be conducted to establish its significance as an individual construct or to merge it as one of the themes under the information construct.

The support for the third added construct, education, is illustrated in Figure 7. Education could be inferred to be a policy lever which the organizations used to bring across the conservation messages, such as ensuring green spaces and biodiversity as well as saving water and energy.

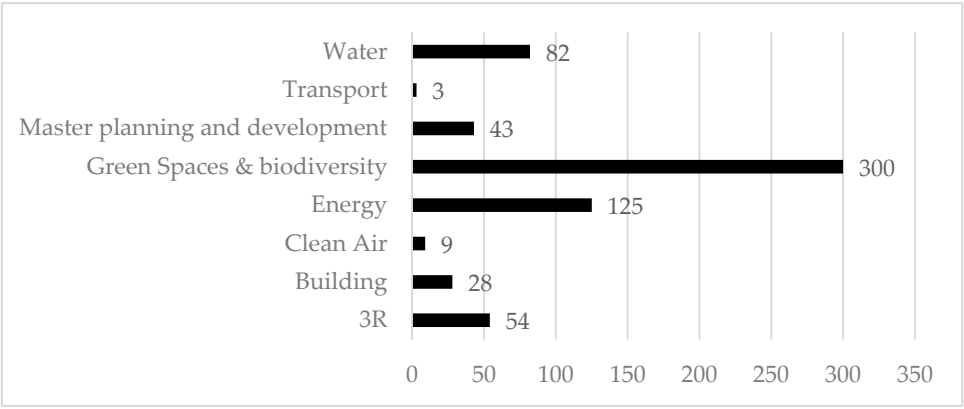

Figure 7. Total number of references in government organization datasets for the education construct.

Lastly, the coders could infer texts to fit the last added construct, design for sustainability. The coders had identified three sub-themes. Green production and procurement was the most frequently coded node for this construct, accounting for 75% of the total references. Two sub-themes, green reputation and eco-labeling, were identified and account for the rest of the references.

6. Discussion

6.1. Theoretical Constructs from the Model of Pro-Environmental Behavior

In this study, the researchers sought to explicate several broadly defined external factors from the model of pro-environmental behavior [25] by integrating them with policy levers from key international frameworks. This pilot study seeks to establish the presence of the proposed explicated constructs: infrastructure, legislation, subsidies and tax. The aim is to build the outer layer of the contextual influence model by identify the policy levers and defining them using the theoretical constructs and sub-themes which could eventually constitute the government's actions in the model.

New insights on theoretical construct explication could be gathered when examining the findings of the datasets. Infrastructure was the most frequently used construct from the model of pro-environmental behavior which the coders used to classify the datasets.

While infrastructural development could be inferred to be the current policy focus undertaken by the Republic of Singapore to mitigate climate change effects, it is also useful to understand that her instinctive driving force could be due to her physical constraint. This low-lying 719.2 km^2 island is densely populated with a population density of 7797 per square kilometers [79]. She has to balance her population's needs for energy with that from her economy to ensure economic survival while meeting her commitment to cut her emissions intensity. Without natural resources and access to alternative eco-friendly energy sources, electricity and energy policies could have thus surfaced prominently in the word cloud in Figure 2a.

As a result of the challenges, the coders could identify several sub-themes. Central planning and leadership could be a sub-theme which emerged during the coding. An example of how the sub-theme of central planning and leadership was inferred is provided below:

> Another example is the development of Singapore as a City in a Garden, which began back in 1963. The late Mr. Lee Kuan Yew mooted the idea of greening the city to ensure that Singapore had a good living environment for all, rich and poor alike, amidst industrialisation and urbanisation. It was also an important factor in persuading potential investors of the commitment, discipline and efficiency of the government. With this goal in mind, there was a long-term plan to carefully choose and plant trees along the streets, creepers and plants at concrete structures, and creating a network of nature reserves, parks, park connectors and tree-lined roads. All these helped Singapore evolve from a Garden City into a City in the Garden today, with almost 10% of our land area committed to parks and nature reserves, and some 300 km of park connectors–because we imagined it. We plan to further increase this in the years to come under the SSB 2015.

The central leadership provided by the late Prime Minister of this island state set the blueprint for a City in the Garden. When executing the blueprint, this central planning approach also created green spaces and brought back biodiversity in the island which could otherwise become a concrete city with rapid urbanization and industrialization taking place to meet the needs of her dense population. Innovation could thus be inferred from the careful selection of trees to plant in midst concrete structures to create pockets of nature within the built-up city. The inference of these policy approaches could serve as useful reference for other cities facing similar constraints when urbanizing and in planning their city development.

The construct of political factors in the model of pro-environmental behavior was explicated in this study as legislation. The findings suggested practical application of this construct. It was not only applied in the infrastructural provision but also extended to consumer products. In addition, the construct could constitute both international agreement and enforcement in practice. Innovation and green spaces and biodiversity were also identified as sub-themes, suggesting the emphases that the Republic of Singapore could have placed on these drivers to cope with resource constraints and yet provide for nature conservation.

The presence of these sub-themes could contribute toward the theoretical explication of the three broadly classified constructs of infrastructure, political and economic factors adapted from the model of pro-environmental behavior and key international climate change frameworks. The model of pro-environmental behavior posits that "institutional barriers" [25] (p. 248) could prevent people from being pro-environmental. The case study suggests that institutions also face barriers and have to overcome them upstream with the sub-themes identified in the coding. The three sub-themes of central planning and leadership, green spaces and biodiversity as well as innovation could act as theoretical antecedents. This also suggests support for the role of government in the contextual influence framework [39–41]. Further studies could be conducted to understand how the layer of government's actions could act to remove or add the barriers to pro-environmental behaviors.

However, the construct of tax as a separate category of economic factors did not surface as prominently in this pilot study. Triangulation of data from other sources [80,81] could be used to establish the need to separately categorize tax and subsidies to understand the role and impact of different economic instruments in the Republic and in climate change policies. As both instruments work differently to achieve the intended policy objectives and effects depending on the socio-economic context, additional studies could also be conducted using online documents from other sites to establish the need for the separate category. This could help to deepen the analysis to establish the type of contextual influences which are more conducive for implementing certain economic levers. Such an analysis could refine policy design.

6.2. Added Theoretical Constructs

The new proposed construct of information was supported in the findings of the pilot study with one in four coded using this construct. This could help to extend the model of pro-environmental behavior toward the contextual influence framework.

The types of information tools coded in this pilot study suggested contextual adaptation and application of information tools. The top most coded node for the non-governmental organizations, certification or award was the next most coded node. The contextual influence on the selection of influence tools could be inferred. The three non-governmental organizations, whose datasets were selected for the pilot coding, specialize in certification and awards through their unique schemes such as Singapore Green Labelling Scheme, the Singapore Green Building Product labeling scheme and corporate social responsibility certification initiatives such as sustainability reporting [82–84]. Though past studies have indicated mixed results of information tools such as eco-labeling on environmentally sustainable behaviors [54,55,85], consumer information has been included as part of the United Nations framework on sustainable development. This study suggested institutional support for use of information tools such as certification or award. The impact of including such a tool in national climate change policies on the pro-environmental behaviors of both producers and individual consumers could be investigated in future studies on environmental sustainability focusing on the other layers of influences originating from the producers and consumers as hypothesized in the contextual influence framework. This could help to refine the climate change policy implementation and delivery for optimal impact.

The pilot study also suggested support for the new construct of design for sustainability to be considered as a possible lever in climate change policies and to constitute part of the extrinsic layer of the contextual influence model. This construct was the third most coded node. Green procurement, which is part of Sustainable Public Procurement Program under the United Nations Environment Program [63], surfaced as a sub-theme during the pilot coding. While this suggested the presence of green procurement as a hypothesized upstream intervention mechanism, studies have shown supply chain and knowledge gaps in operationalizing this and thus mixed results of this emerging phenomenon [86–88]. Further in-depth studies of green procurement could be conducted to deepen the understanding and application, particularly in Asia.

The coders added green reputation as a new sub-theme. To illustrate, the following paragraph was extracted:

> Consequently, the larger supermarket chains such as NTUC FairPrice, Sheng Siong and Prime Supermarket responded by removing all APP products from their shelves, while the Dairy Farm Group stopped the purchase of all APP products. Our consumers, and consumers all around the world, are rightfully indignant when companies here and abroad blatantly violate their health and well-being with unsustainable practices. They are sending the right signals. These actions demonstrate the significant power of a collective consumer voice.

In this example, the local companies boycotted suppliers who sourced paper products from overseas producers with environmentally unsustainable production methods such as polluting slash-and-burn practices to clear land for farming. This example showed an interesting across supply chain effects arising from the interaction of local corporate and consumer actions toward the regional haze caused by overseas producers whose environmentally unsustainable production methods brought harm to the surrounding environment.

The actions of these local companies could signal an inner desire to gain a green reputation among their customers. Hence, while government policies could drive producers through policy levers such as legislation, inner drivers originating from the producers could propel them to take action toward environmental sustainability. The current grounds-up support from corporations in the United States of America to continue with the efforts to cut global emission despite national directive could be an example of such inner drivers [13–16].

This could also be part of the global corporate social responsibility pyramid posited by Carroll [89], where globalization expanded the communal focus of the corporations to include the host countries where they operated. Future studies could be conducted to better understand the drivers for sustainable production and the producers' effects on environmental sustainability as proposed in the contextual influence model in Figure 1.

6.3. Support for Contextual Influence Framework

The contextual influence framework in Figure 1 assumes the presence of the multiple stakeholders, defined using the units of analyses proposed by Salmons [90]. These stakeholders are posited to form part of the system and each part can introduce contextual influence on each other, nudging each other toward environmental sustainability.

The influencing linkages between each part of the system could be observed during the thematic coding. To illustrate this, the following example was extracted from the datasets:

> 10 years ago, the Active, Beautiful, Clean Waters (ABC Waters) was just a concept. At that time, we realised that it was becoming impractical to protect our water resources from pollution by keeping people away. Hence, PUB came up with a bold idea. "Why don't we make the public a part of our team? We could make our drains, canals and reservoirs attractive, so that people would come closer, enjoy and learn to cherish water".

The initial conceptualization of converting concrete walkways into natural streams was achieved through the agency's realization for wider involvement to achieve better policy outcome in water conservation. The agency involved the professionals and the public to achieve higher success in the country's limited water resource more sustainable:

> PUB's implementation of supporting policies and projects are like laying the foundation, while industry experts coming up with innovations and designs would be like building the formwork.

> Most importantly, we are showing the public the value of clean water and empowering them to be stewards of water.

This suggested support for the need to involve and engage multiple stakeholders to achieve the trickling down effects from international, national, organizational, to individual levels such that everyone who has a say in the system can play a part in implementing the policy and shaping its success. The findings from this pilot study suggested the presence of multi-layer engagement. The need for multi-layer engagement is in fact encouraged by the Intergovernmental Panel on Climate Change in its advocacy against individual actions taken for own good, as this would not resolve the global climate change challenge. The Panel views climate change as

> "a collective action problem at the global scale, because most greenhouse gases (GHGs) accumulate over time and mix globally, and emissions by any agent (e.g., individual, community, company, country) affect other agents". [91] (p. 5)

Recognizing the need for multi-layer engagement, the contextual influence model proposes to further examine producers' and consumer's reactions and autonomous actions to government's policies and understand the interaction effects. Studies have shown that production activities could be fueled by consumers' demands and, in meeting spiraling demands, the producers could have created environmental problems during the production process [92,93]. Other than this consideration, producers could also either be pushed or self-ignited to gain green reputation, in order to gain their legitimate place in the ecosystem of agencies ranging from governments, regulators, suppliers, collaborators and customers [94,95] at the domestic, national and international levels.

The example cited above on green reputation as a sub-theme under the construct of design for sustainability suggests that consumers and producers could act together to achieve environmental sustainability. The multiple stakeholders, each with different motivations, add to the complexity of global collaboration and efforts. Despite the complexity, the synergy from the critical linkages and interconnectedness of global actions at all levels should be harnessed to achieve multiplier effects.

The framework proposed in this study is an initial attempt to link the policies to actions and actions to policies to allow assessment of effects and outcomes. This pilot study is undertaken to identify the possible policies constituting the first group of actions which could arise from government policies. Future studies could be conducted to examine the effects of each policy introduced on the corporate and individual consumer stakeholders and by the corporate and people stakeholders on the policy. The intrinsic and extrinsic drivers shaping the producers' and individual consumers' actions could be explicated to further construct the contextual influence model.

7. Conclusions

The pilot study findings suggested support for the theoretical constructs integrated on the model of pro-environmental behavior and the key international climate change frameworks. The preliminary support of the proposed theoretical constructs could contribute toward developing the extrinsic layer of new contextual influence framework. More case studies could be conducted to further identify the key policy levers currently being proposed by other governments in their ratification plans and the intrinsic and extrinsic factors driving both the producers and individual consumers. The refinements could eventually contribute a new contextual influence framework which could help strengthen policy development and outcome measurement internationally.

Acknowledgments: The first author did not receive any funding for the study. The second and third authors thank the NTU WKWSCI Staff Teaching and Research Fund for partial contribution towards publication fees. The three authors would like to thank the two undergraduate co-coders, Miss Kai Wen Mah and Miss Adeline Jong, for assisting in the coding of the datasets.

Author Contributions: Ng, Lwin and Pang conceived the theoretical model; Ng coded the data with two undergraduate co-coders, analyzed the data and wrote the paper; and Lwin and Pang strengthened the analyses and refined the paper.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. United Nations Framework Convention on Climate Change. Historic Paris Agreement on Climate Change. 195 Nations Set Path to Keep Temperature Rise Well Below 2 Degrees Celsius. Available online: http://newsroom.unfccc.int/unfccc-newsroom/finale-cop21/ (accessed on 29 March 2016).
2. World Vision. Worst Natural Disasters of 2015. Available online: http://www.worldvision.org/news-stories-videos/natural-disasters-2015 (accessed on 29 March 2016).
3. National Oceanic and Atmospheric Administration's National Centers for Environmental Information. Global Summary Information-December 2015. Available online: http://www.ncdc.noaa.gov/sotc/summary-info/global/201512 (accessed on 29 March 2016).
4. World Meteorological Organization. Climate Change Breaches Symbolic Thresholds, Fuels Extreme Weather [Press Release]. 2015. Available online: https://www.wmo.int/media/content/wmo-2015-likely-be-warmest-record-2011-2015-warmest-five-year-period (accessed on 29 March 2016).
5. Merica, D. Trump Dramatically Changes US Approach to Climate Change. Available online: http://edition.cnn.com/2017/03/27/politics/trump-climate-change-executive-order/index.html (accessed on 17 June 2017).
6. Dennis, B.; Eilperin, J. Trump Signs Order at the EPA to Dismantle Environmental Protections. *The Washington Post*, 28 March 2017. Available online: https://www.washingtonpost.com/national/health-science/trump-signs-order-at-the-epa-to-dismantle-environmental-protections/2017/03/28/3ec30240-13e2-11e7-ada0-1489b735b3a3_story.html?utm_term=.56e132529e91&utm_term.%20aec68115ab69 (accessed on 17 June 2017).
7. Crilly, R. Donald Trump Pulls US out of Paris Climate Accord to 'Put American Workers First'. *The Telegraph*, 2 June 2017. Available online: http://www.telegraph.co.uk/news/2017/06/01/trump-pull-paris-accord-seek-better-deal/ (accessed on 17 June 2017).
8. Liptak, K.; Acosta, J. Trump on Paris Accord: 'We're Getting out'. *CNN*, 2 June 2017. Available online: http://edition.cnn.com/2017/06/01/politics/trump-paris-climate-decision/index.html (accessed on 17 June 2017).
9. Worland, J. The Perils of Pulling out of Paris. *Time*, 1 Jun 2017. Available online: http://time.com/4800803/the-perils-of-pulling-out-of-paris/ (accessed on 17 June 2017).
10. Carrington, D. Trump's Order Signals End of US Dominance in Climate Change Battle. *The Guardian*, 28 March 2017. Available online: https://www.theguardian.com/environment/2017/mar/28/trump-climate-change-executive-order-us-dominance-china (accessed on 17 June 2017).
11. Bloomberg. China, Canada and EU band together on climate change. *The Straits Times*, 25 May 2017, p. A20.
12. Roston, E.; Dlouhy, J.A. Time for Going-Away Gifts? *Bloomberg Businessweek*, 5 June 2017, pp. 6–7.
13. The Times Editorial Board; Contact Reporter. Trump Is Dropping out of the Paris Agreement, but the Rest of Us Don't Have to. *Los Angeles Times*, 16 June 2017. Available online: http://www.latimes.com/opinion/editorials/la-ed-trump-paris-climate-government-los-angeles-beijing-20170616-story.html (accessed on 17 June 2017).
14. Tabuchi, H.; Fountain, H. Bucking Trump, These Cities, States and Companies Commit to Paris Accord. *The New York Times*, 1 June 2017. Available online: https://mobile.nytimes.com/2017/06/01/climate/american-cities-climate-standards.html (accessed on 17 June 2017).
15. Wilson, R. California Signs Deal with China to Combat Climate Change. *The Hill*, 6 June 2017. Available online: http://thehill.com/homenews/state-watch/336537-california-signs-deal-with-china-to-combat-climate-change (accessed on 17 June 2017).
16. Bromwich, J.E. Defying Trump, Hawaii Becomes First State to Pass Law Committing to Paris Climate Accord. *The New York Times*, 7 June 2017. Available online: https://www.nytimes.com/2017/06/07/climate/hawaii-climate-paris-trump.html (accessed on 17 June 2017).
17. Huutoniemi, K.; Williamo, R. Systematic Thinking of environmental problems. In *Transdisciplinary Sustainability Studies: A Heuristic Approach*; Huutoneimi, K., Tapio, P., Eds.; Routledge: New York, NY, USA, 2014; pp. 23–49.
18. Komiyama, H.; Takeuchi, K. Sustainability science: Building a new academic discipline. In *Sustainability Science: A Multidisciplinary Approach*; Komiyama, H., Takeuchi, K., Shiroyama, H., Mino, T., Eds.; United Nations University Press: Tokyo, Japan, 2011; pp. 2–19.

19. United Nations Framework Convention on Climate Change. Background on the UNFCCC: The International Response to Climate Change. Available online: http://unfccc.int/essential_background/items/6031.php (accessed on 29 March 2016).
20. United Nations Framework Convention on Climate Change. FOCUS: Adaptation. Available online: http://unfccc.int/focus/adaptation/items/6999.php (accessed on 29 March 2016).
21. United Nations Framework Convention on Climate Change. FOCUS: Climate Finance. Available online: http://unfccc.int/focus/climate_finance/items/7001.php#intro (accessed on 29 March 2016).
22. United Nations Framework Convention on Climate Change. FOCUS: Mitigation. Available online: http://unfccc.int/focus/mitigation/items/7169.php (accessed on 29 March 2016).
23. United Nations Global Compact Brochure. Available online: https://www.unglobalcompact.org/docs/news_events/8.1/GCbrochure_FINAL.pdf (accessed on 29 March 2016).
24. Organisation for Economic Co-operation and Development. OECD Environmental Indicators: Development, Measure and Use. Available online: https://www.oecd.org/env/indicators-modelling-outlooks/24993546.pdf (accessed on 29 March 2016).
25. Kollmuss, A.; Agyeman, J. Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environ. Educ. Res.* **2002**, *8*, 239–260. [CrossRef]
26. Lehner, M.; Mont, O.; Heiskanen, E. Nudging–A promising tool for sustainable consumption behaviour? *J. Clean. Prod.* **2016**, *134*, 166–177. [CrossRef]
27. Van Sluisveld, M.A.; Martínez, S.H.; Daioglou, V.; van Vuuren, D.P. Exploring the implications of lifestyle change in 2 °C mitigation scenarios using the IMAGE integrated assessment model. *Technol. Forecast. Soc. Chang.* **2016**, *102*, 309–319. [CrossRef]
28. Osbaldiston, R.; Schott, J.P. Environmental sustainability and behavioral science: Meta-analysis of proenvironmental behavior experiments. *Environ. Behav.* **2011**, *4*, 257–299. [CrossRef]
29. Gifford, R.; Nilsson, A. Personal and social factors that influence pro environmental concern and behaviour: A review. *Int. J. Psychol.* **2014**, *49*, 141–157. [CrossRef] [PubMed]
30. Bamberg, S.; Möser, G. Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psycho-social determinants of pro-environmental behaviour. *J. Environ. Psychol.* **2007**, *27*, 14–25. [CrossRef]
31. Hines, J.M.; Hungerford, H.R.; Tomera, A.N. Analysis and synthesis of research on responsible environmental behaviour: A meta-analysis. *J. Environ. Educ.* **1986**, *18*, 1–8. [CrossRef]
32. Klöckner, C.A. A comprehensive model of the psychology of environmental behaviour—A meta-analysis. *Glob. Environ. Chang.* **2013**, *23*, 1028–1038. [CrossRef]
33. Kao, L.S.; Chiu, Y.H.; Tsai, C.Y. An Evaluation Study of Urban Development Strategy Based on of Extreme Climate Conditions. *Sustainability* **2017**, *9*, 284. [CrossRef]
34. Welford, R.; Frost, S. Corporate social responsibility in Asian supply chains. *Corporate Soc. Responsib. Environ. Manag.* **2006**, *13*, 166–176. [CrossRef]
35. BBC. Climate Change: China Vows to Defend Paris Agreement. 9 May 2017. Available online: http://www.bbc.com/news/world-asia-china-39861589 (accessed on 17 June 2017).
36. Zheng, S; Hollingsworth, J. How China Overtook the US in Leading the Battle Against Climate Change. *South China Morning Post*, 1 June 2017. Available online: http://www.scmp.com/news/china/diplomacy-defence/article/2096545/how-china-overtook-us-leading-battle-against-climate (accessed on 17 June 2017).
37. Edens, R. US' Paris pullout opens opportunity for China. *The Straits Times*, 17 June 2017, p. A39.
38. Nunez, C. China Poised for Leadership on Climate Change after U.S. Reversal. *National Geographic*, 28 March 2017. Available online: http://news.nationalgeographic.com/2017/03/china-takes-leadership-climate-change-trump-clean-power-plan-paris-agreement/ (accessed on 17 June 2017).
39. Seyfang, G. *The New Economics of Sustainable Consumption: Seeds of Change*; Palgrave Macmillian: New York, NY, USA, 2009.
40. Spaargaren, G.; van Vliet, B. Lifestyles, consumption and the environment: The ecological modernisation of domestic consumption. *Environ. Politics* **2000**, *9*, 50–76.
41. Banbury, C.; Stinerock, R.; Subrahmanyan, S. Sustainable consumption: Introspecting across multiple lived cultures. *J. Bus. Res.* **2012**, *65*, 497–503. [CrossRef]
42. Organisation for Economic Co-operation and Development (OECD). *Greening Household Behaviour: Overview from the 2011 Survey-Revised Edition*; OECD Studies on Environmental Policy and Household Behaviour; OECD Publishing: Paris, France, 2014.

43. Chen, M.F.; Tung, P.J. The Moderating Effect of Perceived Lack of Facilities on Consumers' Recycling Intentions. *Environ. Behav.* **2010**, *42*, 824–844. [CrossRef]
44. Cheung, S.F.; Chan, D.K.S.; Wong, Z.S.Y. Reexamining the Theory of Planned Behavior in Understanding Wastepaper Recycling. *Environ. Behav.* **1999**, *31*, 587–612. [CrossRef]
45. Chu, P.Y.; Yeh, S.C.; Yang, S.M. The impact of local mandatory recycling policy on Citizen Recycling Behaviour–a Test of an Integrated Model. *J. Solid Waste Technol. Manag.* **2006**, *32*, 206–219.
46. Lin, A.C. Virtual Consumption: A Second Life for Earth? *Brigh. Young Univ. Law Rev.* **2008**, 47–114.
47. Antal, M.; Van Den Bergh, J.C. Green growth and climate change: Conceptual and empirical considerations. *Clim. Policy* **2016**, *16*, 165–177. [CrossRef]
48. Hertwich, E.G. Consumption and the Rebound Effect–an Industrial Ecology Perspective. *J. Ind. Ecol.* **2005**, *9*, 85–97. [CrossRef]
49. Tiefenbeck, V.; Staake, T.; Roth, K.; Sachs, O. For better or for worse? Empirical evidence of moral licensing in a behavioral energy conservation campaign. *Energy Policy* **2013**, *57*, 160–171. [CrossRef]
50. Tan, Y.S.; Lee, T.J.; Tan, K. Working with People and the Community. In *Clean, Green and Blue: Singapore's Journey towards Environmental and Water Sustainability*; ISEAS Publishing: Singapore, 2009; pp. 257–272.
51. Clark, G. Evolution of the global sustainable consumption and production policy and the United Nations Environment Programme's [UNEP] supporting activities. *J. Clean. Prod.* **2007**, *15*, 492–498. [CrossRef]
52. Unruh, G.; Ettension, R. Growing Green: Three Smart Strategies to Developing Sustainable Products. *Harvard Business Review*, 1 June 2010, pp. 94–100.
53. United Nations Environment, Consumer Information, Including Eco-Labeling. Available online: http://web.unep.org/resourceefficiency/consumer-information-including-ecolabeling (accessed on 5 April 2017).
54. Atkinson, L.; Rosenthal, S. Signaling the green sell: The influence of eco-label source, argument specificity, and product involvement on consumer trust. *J. Advert.* **2014**, *43*, 33–45. [CrossRef]
55. Upham, P.; Dendler, L.; Bleda, M. Carbon labelling of grocery products: Public perceptions and potential emissions reductions. *J. Clean. Prod.* **2011**, *19*, 348–355. [CrossRef]
56. United Nations Framework Convention on Climate Change. Compilation and Synthesis of Supplementary Information Incorporated in Sixth National Communications from Parties Included in Annex I to the Convention that are also Parties to the Kyoto Protocol. Available online: http://unfccc.int/resource/docs/2014/sbi/eng/inf21.pdf (accessed on 6 April 2017).
57. United Nations Environment Programme. The 10-Year Framework of Programmes on Sustainable Consumption and Production. Available online: http://www.scpclearinghouse.org/sites/default/files/10yfp_general_brochure_february_2017-.pdf (accessed on 7 April 2017).
58. Meertens, R.; Schaalma, H.; Fransen, M. The receiver's point of view: Effect hierarchies and the underlying social-psychological process. In *Marketing for Sustainability: Towards Transactional Policy-Making*; Bartels, G., Nelissen, W., Eds.; IOS Press: Amsterdam, The Netherlands, 2002; pp. 163–175.
59. Tanner, C.; Wölfing, K.S. Promoting Sustainable Consumption: Determinants of Green Purchases by Swiss Consumers. *Psychol. Mark.* **2003**, *20*, 883–902. [CrossRef]
60. Evans, M.; Ahmad, J.; Foxall, G. *Consumer Behaviour*; John Wiley & Sons, Ltd.: Hoboken, NJ, USA, 2006.
61. Spangenberg, J.H.; Fuad-Luke, A.; Blincoe, K. Design for Sustainability (DfS): Interface of Sustainable Production and Consumption. *J. Clean. Prod.* **2010**, *18*, 1483–1491. [CrossRef]
62. United Nations Environment Programme. Visions for Change: Recommendations for Effective Policies on Sustainable Lifestyles. Available online: http://www.unep.fr/scp/publications/details.asp?id=DTI/1321/PA (accessed on 19 April 2017).
63. United Nations Environment. WHAT IS SCP? Available online: http://web.unep.org/10yfp/about/what-scp (accessed on 19 April 2017).
64. Robichaud, L.B.; Anantatmula, V.S. Greening Project Management Practices for Sustainable Construction. *J. Manag. Eng.* **2011**, *27*, 48–57. [CrossRef]
65. National Climate Change Secretariat. Singapore's Intended Nationally Determined Contribution (INDC) and Accompanying Information. Available online: https://www.nccs.gov.sg/sites/nccs/files/Appendix%20I%20Singapore%27s%20INDC.pdf (accessed on 2 April 2017).

66. Yang, Y.D.; Chen, Y.; Zhang, H.J. HTML Page Analysis based on visual cues. In *Web Document Analysis: Challenges and Opportunities*; Antonacopoulos, A., Hu, J.Y., Eds.; World Scientific Publishing Co. Pte. Ltd.: Singapore, 2003; pp. 113–131.
67. Lopresti, D. Exploring WWW Resources in Experimental Document Analysis Research. In *Web Document Analysis: Challenges and Opportunities*; Antonacopoulos, A., Hu, J.Y., Eds.; World Scientific Publishing Co. Pte. Ltd.: Singapore, 2003; pp. 273–292.
68. Ingold, R.; Vanoirbeek, C. Document Analysis Revisited for Web Documents. In *Web Document Analysis: Challenges and Opportunities*; Antonacopoulos, A., Hu, J.Y., Eds.; World Scientific Publishing Co. Pte. Ltd.: Singapore, 2003; pp. 315–331.
69. Braun, V.; Clarke, V. Using thematic analysis in psychology. *Qual. Res. Psychol.* **2006**, *3*, 77–101. [CrossRef]
70. Fereday, J.; Muir-Cochrane, E. Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *Int. J. Qual. Methods* **2006**, *5*, 80–92.
71. Basit, T. Manual or electronic? The role of coding in qualitative data analysis. *Educ. Res.* **2003**, *45*, 143–154. [CrossRef]
72. Krippendorff, K. *Content Analysis: An Introduction to Its Methodology*; Sage Publications Inc.: London, UK, 2013.
73. Aronson, J. A pragmatic view of thematic analysis. *Qual. Rep.* **1995**, *2*, 1–3.
74. Vaismoradi, M.; Turunen, H.; Bondas, T. Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nurs. Health Sci.* **2013**, *15*, 398–405. [CrossRef] [PubMed]
75. Paloviita, A. Consumers' Sustainability Perceptions of the Supply Chain of Locally Produced Food. *Sustainability* **2010**, *2*, 1492–1509. [CrossRef]
76. Viégas, F.B.; Wattenberg, M. Timelines tag clouds and the case for vernacular visualization. *Interactions* **2008**, *15*, 49–52. [CrossRef]
77. Cidell, J. Content clouds as exploratory qualitative data analysis. *Area* **2010**, *42*, 514–523. [CrossRef]
78. Heimerl, F.; Lohmann, S.; Lange, S.; Ertl, T. Word cloud explorer: Text analytics based on word clouds. In Proceedings of the 47th Hawaii International Conference on System Sciences (HICSS), Waikoloa, HI, USA, 6–9 January 2014; pp. 1833–1842.
79. Department of Statistics Singapore Latest Data. Available online: http://www.singstat.gov.sg/statistics/latest-data#16 (accessed on 16 April 2017).
80. Jick, T.D. Mixing qualitative and quantitative methods: Triangulation in action. *Adm. Sci. Q.* **1979**, *24*, 602–611. [CrossRef]
81. Thurmond, V.A. The point of triangulation. *J. Nurs. Scholarsh.* **2001**, *33*, 253–258. [CrossRef] [PubMed]
82. Singapore Environment Council. About SGLS. Available online: https://sgls.sec.org.sg/ (accessed on 16 April 2017).
83. Singapore Green Building Council. SGBP Labelling Scheme. Available online: http://www.sgbc.sg/sgbc-certifications/sgbp-labelling-scheme (accessed on 16 April 2017).
84. Global Compact Network Singapore. What We Do. Available online: http://www.csrsingapore.org/c/about/what-we-do (accessed on 16 April 2017).
85. Reiser, A.; Simmons, D.G. A Quasi-experimental Method for Testing the Effectiveness of Ecolabel Promotion. *J. Sustain. Tour.* **2005**, *13*, 590–616. [CrossRef]
86. Albrecht, M. Public Procurement and Forest Governance: A German Case Study of Governmental Influences on Market-Driven Governance Systems. *Soc. Sci.* **2012**, *1*, 4–23. [CrossRef]
87. Fuentes-Bargues, J.L.; González-Cruz, M.C.; González-Gaya, C. Environmental Criteria in the Spanish Public Works Procurement Process. *Int. J. Environ. Res. Public Health* **2017**, *14*, 204. [CrossRef] [PubMed]
88. Mokhlesian, S. How Do Contractors Select Suppliers for Greener Construction Projects? The Case of Three Swedish Companies. *Sustainability* **2014**, *6*, 4133–4151. [CrossRef]
89. Carroll, A.B. Managing ethically with global stakeholders: A present and future challenge. *Acad. Manag. Executive* **2004**, *18*, 114–120. [CrossRef]
90. Salmons, J.E. *Doing Qualitative Research Online*; Sage Publications Ltd.: London, UK, 2016.
91. Intergovernmental Panel on Climate Change. Climate Change 2014. Mitigation of Climate Change: Summary for Policymakers and Technical Summary. Available online: http://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_summary-for-policymakers.pdf (accessed on 22 April 2017).

92. Filho, W.; Pace, P.; Manolas, E. The contribution of education towards meeting the challenges of climate change. *J. Balt. Sci. Educ.* **2010**, *9*, 142–155.
93. Spangenberg, J.; Lorek, S. Environmentally sustainable household consumption from aggregate environmental pressures to priority fields of action. *Ecol. Econ.* **2002**, *43*, 127–140. [CrossRef]
94. Ge, B.; Jiang, D.; Gao, Y.; Tsai, S.B. The Influence of Legitimacy on a Proactive Green Orientation and Green Performance: A Study Based on Transitional Economy Scenarios in China. *Sustainability* **2016**, *8*, 1344. [CrossRef]
95. Kim, D.; Lim, U. Urban Resilience in Climate Change Adaptation: A Conceptual Framework. *Sustainability* **2016**, *8*, 405. [CrossRef]