Article

Greenwashing of Local Government: The Human-Caused Risks in the Process of Environmental Information Disclosure in China

Yanhong Tang [1], Rui Yang [2],*, Yingwen Chen [2], Mengjin Du [2], Yichen Yang [2] and Xin Miao [2]

[1] School of Public Administration and Law, Northeast Agricultural University, Harbin 150030, China; tangyanhong@neau.edu.cn

[2] School of Management, Harbin Institute of Technology, Harbin 150001, China; 20B310001@stu.hit.edu.cn (Y.C.); 20160672@stu.neu.edu.cn (M.D.); m71614020@stu.ahu.edu.cn (Y.Y.); miaoxin@hit.edu.cn (X.M.)

* Correspondence: 18b910068@stu.hit.edu.cn

check for updates

Abstract: The increasing occurrences of greenwashing pose great risks to environmental protection. The current studies mainly focused on corporate greenwashing, and few paid attention to the greenwashing of the local government (GLG), thus lacking methods to identify the risks of forming the GLG and finding practicable countermeasures. This paper tries to fill the research gap in the study of the GLG by analyzing human factors. Given that the GLG is in close relationship with environmental governance pressures related to environmental information disclosure (EID), this paper attempts to analyze the human-caused risks of forming the GLG in the process of EID. This work focused on the process analysis, examined the human causes that form the GLG in the stages of collecting, medium, and disseminating of environmental information (EI), and offered countermeasures embedded with resilience accordingly.

1. Introduction

With increasing demands for green products, green services, and sustainable development (e.g., [1]), more and more organizations are engaged in greenwashing in their environmental information (EI) reporting by exaggerating their commitment to environmental protection and misleading the public on the organizations' environmental performance to gain the benefits from the expanding green market [2]. The phenomenon of greenwashing is, therefore, booming worldwide [3].

The existing literature mainly focused on the discussion of the definition of greenwashing (e.g., [4,5]); the hazardous impact of greenwashing on the economy, society, and environment [6–8]; and the empirical demonstration of the occurrence of greenwashing in different situations [9,10]. However, the current studies lacked a comprehensive analysis of the drivers of greenwashing, thus managers or decision-makers have few available methods to identify and prevent greenwashing. Although Delmas and Burbano [2] proposed a framework that included external, organizational, and individual drivers of greenwashing, the framework is used to identify and prevent corporate greenwashing. Research on the greenwashing of the local government (GLG) is still in its infancy, but the phenomenon of the GLG is very common and has no less harm than corporate greenwashing, It may induce the public to lose confidence in government environmental protection, resulting in negative social impact [11–13]. A case in point is that the Environmental Protection Bureau of Xiaoshan District in Hangzhou (a model in community environmental protection) was sued by more than 200

local residents for concealing the environmental impact. The incident triggered public uproar at that time [14]. Therefore, the GLG should be attached great importance.

The term of greenwashing was put forwarded by Greer and Bruno in 1996, and now it is widely used [15]. It is an interdisciplinary concept [16], and scholars have not yet reached an agreement on its definition [4,17]. Many scholars defined it as misleading EI communication under the strategic intention of organizations [17–19]. Local governments have the responsibility to disclose necessary EI (such as information about pollution of the air, soil, and water) to the public. Environmental information disclosure (EID) is one of the most common and main environmental communication tools for local governments, and it is most likely to be used as a tool for the GLG. Especially, along with the increasingly strict requirements for EI transparency from central government and other environmental stakeholders, EID-related pressure on local governments has increased sharply [20]. Faced with legal requirements, local governments with poor environmental performance have to disclose much more egoistic EI. On the one hand, it can cover the reality and enhance the impression management so as to avoid penalties from the central government and mass protests from other environmental stakeholders [21–23]. On the other hand, it helps to gain more opportunities for the promotion of local officials, thus causing the growing popularity of the GLG. In this sense, this work contributes to the identification and prevention of the GLG from the perspective of EID.

Delmas and Burbano [2] illustrated that the occurrence and severity of greenwashing can be reduced through positive human behavior and vice versa. Furthermore, given that the GLG poses a great risk to the environment and society, the paper thus regards the GLG as a kind of human-caused risk. The risks caused by humans generally lead to uncertainty and pose a challenge to environmental regulation [24]. This is why no matter how EID-related laws are modified they always have limitations in preventing greenwashing [2]. A thorough analysis of human causes in the process of EID is beneficial in reducing the GLG [25]. The idea of resilience was proposed in the organization management field to cope with human-caused risks (e.g., [24,26]). The notion of "resilience" was first proposed in the 17th century, and its original meaning was rebound [27]. In the Oxford dictionary, resilience is defined as a capacity to rebound, which means the system or object could be capable to return to its original stage after suffering exogenous pressures [28]. It actually serves as an overarching concept to represent the idea of managing risks through mitigation and prevention, involving in how both internal and external stakeholders of the organizations adapt to and act on risks [29]. There is theoretical and practical significance in terms of how an organization copes with risks based on resilience (e.g., [30–32]).

Accordingly, the paper aims to identify the human-caused risks of the GLG from EID and attempts to explore feasible measures to reduce human-caused risks and prevent the GLG through embedding resilience. The rest of the work is arranged as follows. The second section introduces the methodology of the research, which lays a foundation to detect the risks of the GLG and highlights the innovative points of the research. Section 3 is materials and analysis, describing how the work draws evidence from typical cases to demonstrate the human-caused risks in forming the GLG in the process of EID and providing result analysis. Section 4 discusses resilience-oriented countermeasures to prevent the GLG in each stage of EID. The last part draws a conclusion of the major findings.

2. Methodology

The Swiss cheese model can be understood from the perspective of organizational risk management. Advanced organizational management is regarded as a firewall to prevent the evolution of risks, and poor organizational management would be a booster to accelerate the evolution of risks [33]. Although some studies in recent years have debated the limitations of the Swiss cheese model in terms of complexity, systematicity, and practicality, these disputes have not yet reached a unanimous conclusion [34–36]. Larouzee and Le Coze [37] systematically reviewed the advantages and disadvantages of the Swiss cheese model, emphasized the advantages of the model, and clarified its contributions to organizational risk management. With the development of the practice, more and more scholars have expanded the application of the Swiss cheese model to different fields to explore

the occurrence of risks caused by organizational management failures and to seek measures for prevention [38,39]. It has a proper theoretical basis in the organizational risk management for case study [40], and no previous scholars have applied this model to the field of human-caused risks related to the GLG. It helps close the gap in existing investigations in the GLG field.

For research on greenwashing, previous scholars have investigated its reasons from perspectives such as marketing strategies and public relations [7], stakeholders' accusations of pressure response [4], and organizational culture and characteristics [2]. These studies involve external or organization factors, but few scholars consider greenwashing from the perspective of prevention of human-caused risks. However, considering the deceptive and deliberate characteristics of greenwashing [41], analyzing human-caused risks plays an important role in a deeper understanding of the formation of greenwashing. This research aims to fill the gap of the existing research. Furthermore, human-caused risks are difficult to be completely eliminated because of the unpredictability and uncertainty of human behaviors, which is the crux of why greenwashing appears repeatedly. However, the probability of the risks can be reduced by improving the process of organizational risk management [33]. In addition, although there may be other municipal services other than EID that might lead to the formation of the GLG, to our best knowledge, there is little information on the factors affecting the formation of the GLG in existing research, and there is no experience to follow on the factors that can cause the GLG. As outlined above, EID is a key tool used by organizations for greenwashing. Accordingly, it should be a window for studying the GLG.

EID was initially proposed in the late 1980s, which is originally referred to the government disclosure of toxic release inventory from the polluting organizations to the public by official notice [42]. With the increasing demands for environmental protection, the governments have gradually spent more resources on collecting EI from polluting corporations and providing it to the public through various mediums [42]. It suggests that EID is actually the whole process of the government's collecting EI from polluting organizations, building an EI communication medium, and then disseminating it to other stakeholders. This process is mainly completed by the local government as the main regulator of environmental governance and the main executor of environmental policies (see Figure 1). In view of communication science, information collection, information medium, and information dissemination are three indispensable stages in the communication structure [43]. Otherwise, the process of EID fails and the GLG is most likely to be formed.
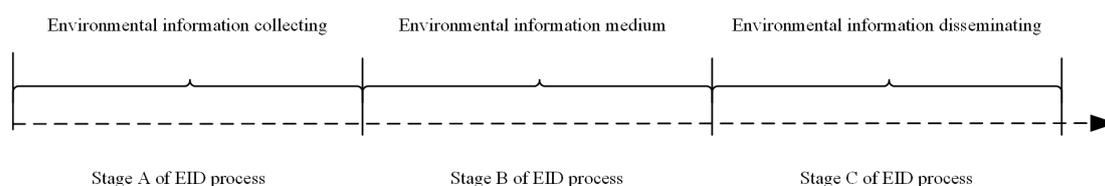

Figure 1. Process of environmental information disclosure (EID) conducted by the local government.

Conducting a thorough analysis of human causes in each stage of the EID process is helpful as the identification of common human causes can make contributions to the design of the countermeasures. It would also contribute to the reduction of potential risks accordingly. For preventing the GLG from the aspects of the process of EID, resilience may be considered from two perspectives. One is avoiding the occurrence of the GLG, and the other is minimizing losses and negative social influences it causes [44].

The paper develops the work of Delmas and Burbano [2] from static level analysis to dynamic process analysis, exploring the drivers of the GLG from the perspective of human causes, helping to early and thoroughly find out the drivers of greenwashing. Through content analysis on 20 GLG cases caused by EID in China, this work identifies potential human causes and their distributions in each stage of the EID process, proposing countermeasures accordingly and embedding resilience in the process of the management of EID to mitigate and prevent the GLG. Since China is an emerging

economy with great influence around the world, this work draws evidence from China, possibly enlightening the GLG governance in other emerging countries to a certain degree.

3. Materials and Analysis

3.1. The Materials

In 2009, the Institute of Public and Environmental Affairs (IPE) and the U.S. Natural Resources Defense Council (NRDC) jointly developed the Pollution Information Transparency Index (PITI) report, which is used to evaluate the EID situation of 113–120 local governments in China. It has experienced ten years of development up to now. Specifically, IPE and NRDC evaluate the situation of all the mediums set by local government to conduct the process of EID, that is, the process of obtaining the EI from polluting organizations, and then processing it through the platform and eventually disseminating to other stakeholders. Note that the cities or provinces included in the report were rated as national key environmentally friendly cities or regions because of good environmental performance, but some of them failed to perform as well as their EID showed, which have been detected by the IPE and NRDC. This phenomenon can be deemed as GLG caused by EID. Thereby, the cases from the PITI quite meet the demands of this research. In addition, a large number of scholars have carried out EID-related research by using the PITI report (e.g., [23,45,46]), and the report has been widely recognized by governments, Non-Governmental Organizations (NGOs), consulting companies, and educational and research institutions (e.g., [47]). The cases provided in this report are therefore authoritative and representative. Therefore, the cases in the PITI report become the research materials.

Although there are hundreds of related cases in the ten-year PITI reports, in order to improve the quality of the analysis and ensure the accuracy of the results, the paper selected the cases according to the following screening criteria: (1) They are derived from PITI reports after 2014 to ensure they are fresh; (2) The selected contents are credible and can be verified through various official mediums to ensure their authenticity; (3) They spread across different provinces and regions to ensure their universality; (4) They should also be in English which can benefit more audiences, thus the 2019 PITI report was excluded because of having no English version; (5) The cases are comprehensively described in PITI reports which can minimize the authors' subjective bias. This work finally selected 20 satisfied cases from the reports.

The research team categorized the human causes from the 20 cases into each EID stage. In order to ensure the accuracy of classification, this article determined the following four steps to classify the human-caused risks in each stage. First of all, the confirmation of human-caused risks in each stage was based on factual evidence, and all information came from the traceable PITI report, which ensures the authenticity of the classification. Secondly, for the judgment of whether it is a human-caused risk, this research referred to the research experience of existing research to make the classification more convincing and scientific. The specific considerations were as follows. There are many methods for the classification of human-caused risks (e.g., [48–50]). Among them, Reason [50], the proponent of the Swiss cheese model, divided human-caused risks into four categories, namely "slips, lapses, mistakes, and violations." Reason [33] further pointed out that these human-caused risks stem from two aspects. One is due to abnormal psychological processes. The specific manifestations are: "forgetfulness, inattention, insufficient motivation, negligence and recklessness" [38]. The second is due to errors in all aspects of a system that are operated by people (such as insufficient equipment reserves, poor design, poor supervision, manufacturing defects, shielding a shortcoming, insufficient training, poor automation, inappropriate procedures, or unclear definitions) [38]. Scholars have used the above-mentioned classification of human-caused risks to carry out research in different fields (e.g., [40]), which shows that these classifications have considerable feasibility and theoretical basis. Accordingly, this research regards the low data-collection rate, no timely EID, the problems of platform setting, and other issues exposed in the case as human-caused risks. Specifically, the low rate of data collection may be due to the above-mentioned insufficient motivation, poor supervision,

and insufficient training. No timely EID is likely to be caused by a variety of human-caused risks such as negligence, poor automation, poor supervision, and inappropriate procedures. In addition, the problems of platform setting may also be caused by human factors such as poor design and poor automation. In view of the fact that the human-caused factors that lead to the GLG identified in this study involve more, the authors will not repeat the process of the analysis one by one here. Thirdly, after identifying human-caused risks based on the above criteria, this article needs to classify and summarize which stage of EID these man-made risks belong to. As explained in the section of methodology, EID is actually the whole process of collecting environmental information from polluting organizations, establishing environmental information dissemination media, and then disseminating it to other stakeholders by local governments. At different stages, there are obvious differences in the EID behavior of local governments. This article generally uses the keyword "collection" or synonymous as the standard when identifying the human-caused risks at the stage of collecting EI from pollution sources by local governments. For the EI media stage, it is concerned about the "platform" of information disclosure that is built by local governments. For the EI dissemination stage, it is concerned with the information disclosed by the government. Fourthly, in order to make the classification of this article more accurate, this study also adopted the expert discussion method. That is, with the help of well-trained assistants, professionals in this field independently match the review content one by one, then negotiate the differences until the opinions are fully agreed.

Table 1 briefly introduces how the human causes form the GLG in the three stages of the EID process and they provide evidence that human causes are present in each stage of the EID process and the human causes in each stage may form the potential risks of the GLG. This demonstrates that the GLG is a kind of risk caused by human factors. It also explains that it is difficult to completely eliminate the risks of the GLG only relying on regulations and laws. The method employed in the work can not only identify how the human causes contribute to GLG outbreaks but also find the common human causes in each stage that enables enlightening of purposeful EID policies to prevent the GLG. Of course, the human causes of the GLG can be identified by Fuzzy Cognitive Map or Fault Tree Analysis, but the traditional fault analysis techniques cannot explain how the local government uses EID to evolve into the GLG, a kind of influential public risk. This paper focuses on process analysis and attempts to demonstrate the role of human causes in the process of EID, that is, how to form and prevent the GLG. Therefore, risk management from the perspective of the human causes is of both theoretical and practical significance to provide the new insights.

Table 1. GLG (greenwashing of the local government) cases involving human factors in each stage of the EID (environmental information disclosure) process. EI: environmental information.

No.	Location	Year	Human Factors in Each Stage of the EID Process
1	Hebei	2014 2017	A: The data-collection rate was generally low; Low-quality information collection. B: There were problems with the platform settings that was difficult to search. C: The information lacked integrity; The monitoring data of each indicator was not displayed in combination with the standard limit values, which was impossible to judge the compliance of the wastewater/exhaust gas discharge of each monitoring corporation.
2	Zhangjiajie (Hunan)	2014 2016 2017	A: Low EI collection rate; Lacking necessary information on many polluting corporations; Disregarding complaints and suggestions from the public or netizens. B: EID mediums were not diverse, e.g., no disclosure channel for mobile terminals. C: EID was not timely.

Table 1. *Cont.*

No.	Location	Year	Human Factors in Each Stage of the EID Process
3	Harbin (Heilongjiang)	2014 2016 2017	A: Disregarding public complaints and suggestions. B: EID mediums were not diverse, e.g., no disclosure channel for mobile terminals. C: EID was not comprehensive and irregular.
4	Yangquan (Shanxi)	2014 2016 2017	A: Low EI collection rate; Many pollution corporations have never uploaded data; EID collection quality was quite low. B: EID mediums were not diverse, e.g., no disclosure path for mobile terminals. C: EID was not timely, that is, EI has stopped being updated for a long time.
5	Jiangxi	2014	C: Incomplete EID, that is, much necessary EI has not been disclosed.
6	Inner Mongolia	2014 2017	A: Low EI collection rate; Many pollution corporations have never uploaded data; Disregarding complaints and suggestions. C: EID was not timely.
7	Guangxi	2014	A: The average collection rate of EI in the four evaluated cities in Guangxi was very low, only 14.38%. B: The platform was in the form of a scrolling screen, which was not convenient for stakeholders to obtain information.
8	Hubei	2014	A: Average collection rate of 3 evaluation cities in Hubei was quite low, only 3.12%. B: Difficult operability for user searching. C: EID was not timely.
9	Tianjin	2014 2017	A: Average collection rate was quite low, only 9.31%; Failure to perform quality monitoring, e.g., low-quality information collection. C: EID was not timely and irregular; The integrity of EID was insufficient; The real-time monitoring data was not displayed in combination with the standard limit values.
10	Guizhou	2014 2017 2018	A: Average collection rate was quite low; Information collection stopped. B: Inconvenient searching settings for users. C: EID was not timely, that is, EI has stopped being updated for a long time.
11	NanChong (Sichuan)	2014 2016	A: Low EI collection rate. B: EID mediums were not diverse, e.g., no disclosure mediums for mobile terminals. C: EID was not timely.
12	Xining (Qinghai)	2015	B: EID mediums were not diverse, e.g., no official social platform of EID has been established. C: EID was not updated.
13	Yuxi (Yunnan)	2015 2016 2017	A: Disregarding complaints and suggestions from the public or netizens. B: EID mediums were not diverse, e.g., no disclosure mediums for mobile terminals. C: Incomplete and no updated EID.
14	Chongqing	2016 2017	A: Low EI collection rate; Many pollution corporations have never uploaded data; Disregarding NGO's complaints and suggestions. C: Information disclosed without explanation; EID was not timely, that is, EI has stopped being updated for a long time.
15	Kaifeng (Henan)	2016 2017	A: Disregarding complaints and suggestions from the public or netizens. B: EID mediums were not diverse, e.g., no disclosure mediums for mobile terminals.
16	Huzhou (Zhejiang)	2017	A: Disregarding complaints and suggestions from the public or netizens.
17	Gansu (Lanzhou)	2017	A: Disregarding complaints and suggestions from the public or netizens.

Table 1. *Cont.*

No.	Location	Year	Human Factors in Each Stage of the EID Process
18	Xianyang (Shanxi)	2017	A: Disregarding complaints and suggestions from the public or netizens.
19	Chizhou (Anhui)	2018	A: Disregarding complaints and suggestions from the public or netizens. C: Concealment of pollution information.
20	Yancheng (Jiangsu)	2018	A: Disregarding complaints and suggestions from the public or netizens. C: Concealment of pollution information.

3.2. Results and Analysis

3.2.1. Results

Table 2 summarizes the human factors in each stage of the EID process and its distribution of human factors in each stage of the EID process to find the common characteristics. This will help to find ways to reduce the human-caused risks of the GLG in the process of EID and put forward more targeted countermeasures for identifying and preventing the GLG. It can be seen from Table 2 that in these 20 cases, Stage A of the EID process has the highest frequency (28 times), indicating that this stage is highly likely to form a risk of greenwashing. Stage C of the EID process has 21 times which is slightly lower than Stage A of the EID process. Stage B of the EID process is of the least frequency (16 times) of all stages of the EID process. These results will be discussed in detail in the next section.

Table 2. Summary of the different kinds of human factors in each stage of the EID process.

Stage	Latent Greenwashing	Frequency	Case Number	Distribution of Different Human Factors in Each Stage (%)
Stage A of EID process	1. Insufficient EI collection.	10	1,2,4,6,7,8,9,10,11,14	35.7
	2. Failure to perform quality monitoring in EI collection.	7	1,2,4,6,9,10,14	25
	3. Indifferent to complaints and suggestions for the environment from other stakeholders.	11	2,3,6,13,14,15,16,17, 18,19,20	39.3
In total		**28**		**100**
Stage B of EID process	1. Inconvenient operation of EID mediums.	4	1,7,8,10	36.4
	2. Failure to construct diverse EID mediums.	7	2,3,4,11,12,13,15	63.6
In total		**10**		**100**
Stage C of EID process	1. Untimely or irregular EI disseminating.	11	2,3,4,6,8,9,10,11,12, 13,14	52.4
	2. Incomplete or concealing EI disseminating	7	1,3,5,9,13,19,20	33.3
	3. Failure to perform quality EI disseminating.	3	1,9,14	14.3
In total		**21**		**100**

3.2.2. Results Analysis

Different Human Causes in Stage A of the EID Process

Stage A of the EID process contains three kinds of human-caused risks: insufficient EI collection, failure to perform quality monitoring, and indifferent to complaints and suggestions for the environment

from other stakeholders. It can be seen from Table 2 that the human causes of disregarding complaints and suggestions of EID are the largest share in Stage A (39.3%). Its specific performance in the PITI report is environmental complaints solving with a score of zero or resistance to NGO complaints and suggestions [51,52]. Wang and Na [53] pointed out that social EID supervision is lacking authority and mandatory, often ignored and resisted by local governments. Unless some large mass events or high media exposure occurs, complaints from other stakeholders are hard to attract attention to, which provide a condition for local government to disclose misleading EI.

The other two human causes accounted for 35.7% and 25.0% in this stage, respectively, thus they also need to be attached importance. The specific performances of them are included: low data-collection rate, delayed collection of EID from key polluting corporations, or low quality of EID collection [54]. Du et al. [55] stated that collecting EI might be hindered by legal defects. Vast countries lack independent environmental justice systems for the staffing and funds decided by superior departments, which lead to right weakness and resource limitations of the local government [55]. Thus, the EI collection becomes superficial and formalistic, and accordingly, pollution gets worse [13]. However, Nicholas et al. [56] found that the negative EI disclosed by local governments would be protested by NGOs and local residents. Therefore, when local governments are not able to reduce environmental pollution or meet environmental requests from other stakeholders, they have to adopt greenwashing via disclosing untrue EI or disclosing selective EI to avoid mass protests or punishments from the central government.

Different Human Causes in Stage B of the EID Process

The proportion of the two different human causes in Stage B of the EID process has a certain gap (inconvenient operation of EID mediums (36.4%) and failure to construct diverse EID mediums (63.6%). Inconvenient platform-setting operations with complex procedures, unscientific information presentation methods, and non-diversified disclosed mediums are the specific manifestations of the two human causes. Firstly, Siano et al. [57] claimed that EID needs multiple mediums to ensure its roles. The reason is that different stakeholders have different channel preferences for obtaining EI [56,58]. However, local governments' failing to construct diverse EID mediums offers convenience for their greenwashing because their EID is not able to be checked by various stakeholders [59,60]. In addition, inconvenient operation of the EI mediums provides the condition for the GLG as it makes it hard for other stakeholders to check EID. Some scholars pointed out that many local officials had the weakening responsibilities or poor skills of EI management that hampered the effectiveness of local governments' EID [61,62]. Accordingly, it is imperative to improve the skills and responsibility of local officials.

Different Human Causes in Stage C of the EID Process

First, untimely or irregular EI disseminating is the most important human cause in Stage C of the EID process, accounting for up to 52.4%, and it needs to be paid enough attention. The untimely EID provides opportunities for data "adjustment" by the local government and prevents other stakeholders from obtaining real and effective EI [52], which undoubtedly makes EID become a tool for the GLG. The information asymmetry between local government and other environmental stakeholders may be one of the reasons for the problem. It is because the information asymmetry enables local governments to disseminate distorted EI by using an information-gap and impression-management strategy [63] to meet their legitimacy demand [64], which induces the GLG.

Second, incomplete or concealing EI disseminating is the second most frequent human cause in this stage, and its main manifestation is the lack of completeness of EID (e.g., case 1,9). Meanwhile case 19 and case 20 show that only with the continuous exposure by the media can it get attention from the higher authorities, and then the facts hidden by local governments may be known. The two problems actually result from inadequate supervision from the central government. However, the survival and development of an organization are based on legitimacy. Palazzo and Scherer [65] stated that

organizations could get legitimacy only relying on symbolic management or instrumental public relations, regardless of the untruth in EID.

Third, the failure of a qualified EI disseminating relies on the insufficient explanation of the content of the EID and confused or ambiguous information (e.g., [52,54]). Although the EID mandatory requirements from the central government result in an increasing amount of EID, the quality and depth of EID are still unsatisfactory (e.g., [66,67]). A lack of data and interpretation of EI gives a chance to the GLG. This problem may be induced by lacking standard operating procedures or supervision from other environmental stakeholders.

4. Resilience-Oriented Countermeasures

4.1. Resilience-Oriented Countermeasures in Stage A of the EID Process

Firstly, stakeholders play an important role in helping the identification and prevention of greenwashing [68] because most of them as the front-line perceivers are likely to sense the difference between the reality and the publicity of local governments' EI. However, the local governments' indifference to social supervision has become a social consensus. Unless it greatly damages their own interests, few people will take the trouble to complain to the governments. It is found that even the water pollution problems are directly related to life, about 50% of people have never complained to governments when encountering occurrence [69], not to mention the GLG. Therefore, in order to give stakeholders more desire to provide evidence to reveal the GLG, there should be added an expert evaluation and Q&A and set up an index for the response rate of local governments so as to overcome the weak position of social supervision.

Secondly, the assessment of environmental performance has been incorporated into the performance assessment of local officials in many countries. However, environmental protection is a long-time process, and the local government cannot quickly meet the demands from the central government and other environmental stakeholders, which lead to much pressure on the EID of the local government, and the GLG is thus induced. In the sense, institutional arrangement and mechanism design should focus more on incentivizing local officials to increase their EID willingness rather than passively taking measures under mandatory pressure. Encouraging local governmental officials to commit to practical activities related to EID and being recognized by both internal and external environmental stakeholders are conducive to forming the atmosphere for environmental performance transmitting favorable signals. For example, setting the leading award for EID as an index to measure the local governments' ability of environmental governance may be a good way as it could reflect the comprehensive capacity and superiority of local governments in effectively improving EID. In the case, EID will not be the pressure for local officials and thus can avoid the occurrence of the GLG accordingly.

4.2. Resilience-Oriented Countermeasures in Stage B of the EID Process

The popularity of the internet has increased people's interests in obtaining EI and expressing their environmental willingness [58], and many social platforms thus have become new mediums of environmental communication [23]. Moreover, Tang et al. [40] found that many stakeholders with the willingness for complaints tend to informally transfer the complaints to anyone around who are easy to contact such as community workers and neighbors, rather than the competent departments. However, in policy decision-making, the local government leaders tend to adopt the public opinions collected from formal mediums, while the adoption rate of the public opinions from informal mediums is relatively low [70], which results in many complaints from other stakeholders in informal mediums not being known by the responsible officials. According to the results of contents analysis, local governments should further broaden the mediums for EI communication. It is necessary to leverage the advantages of NGOs to score the diversion of the EID mediums and their management status as well as the operability. This approach based on external supervision can help increase the involvement of other stakeholders in monitoring, thereby minimizing the GLG caused by information asymmetry.

Many scholars argued that the weak responsibility of EI management of local officials should be attributed to environmental regulation limitations [2]. However, that is not all. EID value culture needs to be paid attention. A lack of awareness of EID responsibility and recognition of EID value by local officials is the real problem. It is necessary to strengthen the environmental responsibility of local government officials and form a culture of environmental responsibility. The following provides ways for enhancing the environmental responsibility of local government officials:

- Build an EID management system to regulate EID procedures.
- Ensure the leaders of local governments set a positive example in EID management.
- Improve skills of EI medium management and awareness of EID value culture among first-line local officials.
- Learn lessons from past GLG events.
- Establish an ongoing self-assessment system for environmental responsibility culture and update it timely.

These proposals are based on the assumption that local governments have a positive motivation and strong determination to enhance environmental responsibility. However, the fact may not be so. It should better design incentive compatibility mechanism at the same time [71] to guide the behaviors of local governments.

4.3. Resilience-Oriented Countermeasures in Stage C of the EID Process

The pollutant release and transfer register (PRTR) system to achieve the emission reduction should be established. It is an EID network formed by incorporating internal and external resources based on technical advantages. It helps to overcome the limitations of EI asymmetry, construct a diversified interactive platform, empower more stakeholders to participate, ensure the quality of EID, and prevent the GLG. Network governance mechanism is often used in the system to improve organizational resilience (e.g., [72–74]). Unfortunately, the PRTR system is far from popular in developing countries 2.

Given the specific performances of human causes in Stage C of the EID process, the preventive risk-management tool based on the principles of Hazard Analysis and Critical Control Points (HACCPs) should be a way to reduce the probability of human causes and to further prevent the GLG. Although the principles of HACCPs were originally created for the food industry, it has been successfully applied to risk management in a large number of disciplines [75]. It contributes to confirming the desired workflow and avoiding possible trouble that may lead to avoidable risks [40]. Designing a specific and reliable EID process can make it easy for local officials to do the right thing and hard to do the wrong thing [76] through clarifying responsibilities and the EID operating process, thus reducing human-caused risks and preventing the GLG. By understanding the distribution of specific human causes in the stage, the HACCPs can be developed accordingly.

5. Conclusions

The prevalence of greenwashing poses a challenge to environmental protection. However, the GLG has not been paid due attention. This paper tries to fill this gap by analyzing the human factors in the process of EID [77], which is a common and main tool for local governments to take up greenwashing. The paper regards the GLG as a human-caused risk in the process of EID covering the three stages of EI collecting, medium, and disseminating. It contributes to analyzing the drivers of the GLG forming. The notion of resilience is advised to be embedded in risk management to minimize the uncertainty of organizational management and negative social influence. The results imply that human causes in each stage of the EID process can lead to the GLG, and special attention should be paid to the human causes in the stages of EI collection and dissemination.

This work draws evidence from PITI reports and focuses on the GLG problems in China, which does not cover the situations of other countries. Extending the case sources is meaningful for further studies to improve the results of the research. Further strengthening the cooperation of scholars around the

world in this field, sharing resources together, and giving full play to the advantages of NGOs should be important ways to address this issue. Furthermore, the work is exploratory research, and future scholars can consider developing a scale to measure the detection and prevention capability of the GLG through the method of questionnaire survey or interview so as to better apply the theoretical ideas into practice. This article focuses on the influence of human factors on the formation of the GLG in the process of EID and does not involve the exploration of other municipal services. Therefore, using other methods (such as bibliometrics, descriptive statistics, and content analysis) to determine which municipal services will lead to the formation of the GLG will be one of the outlets in this field in the future.

References

1. US; SIF. Global Sustainable Investment Alliance releases GLOBAL Sustainable Investment Review 2018 Report. Available online: https://www.ussif.org/files/News%20Release%20-%2003_28_19%20US%20SIF%20GSIA%20Report%202019%20REVISED%20(1)(4).pdf (accessed on 20 June 2019).
2. Delmas, M.A.; Burbano, V.C. The drivers of greenwashing. *Calif Manag. Rev.* **2011**, *54*, 64–87. [CrossRef]
3. Hsu, T. Skepticism Grows over Products Touted as eco-Friendly. Available online: http://articles.latimes.com/print/2011/may/21/business/la-fi-greenwash-20110521 (accessed on 1 August 2020).
4. Seele, P.; Gatti, L. Greenwashing revisited: In search of a typology and accusation-based definition incorporating legitimacy strategies. *Bus. Strat. Environ.* **2017**, *26*, 239–252. [CrossRef]
5. Gillespie, E. Stemming the tide of 'greenwash'. Consumer Policy Review. *J. Bus. Etihcs* **2008**, *18*, 79–83.
6. Yu, E.P.; Van Luu, B.; Chen, C.H. Greenwashing in environmental, social and governance disclosures. *Res. Int. Bus. Financ.* **2020**, *52*, 101192. [CrossRef]
7. Shnayder, L.; Van Rijnsoever, F.J.; Hekkert, M.P. Putting Your Money Where Your Mouth Is: Why Sustainability Reporting Based on the Triple Bottom Line Can Be Misleading. *PLoS ONE* **2015**, *10*, e0119036. [CrossRef]
8. Chen, Y.S.; Chang, C.H. Greenwash and green trust: The mediation effects of green consumer confusion and green perceived risk. *J. Bus. Ethics* **2013**, *114*, 489–500. [CrossRef]
9. Chen, H.; Bernard, S.; Rahman, I. Greenwashing in hotels: A structural model of trust and behavioral intentions. *J. Clean Prod.* **2019**, *206*, 326–335. [CrossRef]
10. Polonsky, M.J.; Bailey, J.; Baker, H.; Basche, C.; Jepson, C.; Neath, L. Communicating environmental information: Are marketing claims on packaging misleading? *J. Bus. Ethics* **1998**, *17*, 281–294. [CrossRef]
11. Furlow, N.E. Greenwashing in the New Millennium. *J. Appl. Bus. Econ.* **2010**, *10*, 22–25.
12. Goldman, E.; Rocholl, J.; So, J. Politically connected boards of directors and the allocation of procurement contracts. *Soc. Ence Electron. Publ.* **2013**, *17*, 1617–1648. [CrossRef]
13. Wong, C.W.Y.; Miao, X.; Cui, S.; Tang, Y.H. Impact of Corporate Environmental Responsibility on Operating Income: Moderating Role of Regional Disparities in China. *J. Bus. Ethics* **2018**, *149*, 363–382. [CrossRef]
14. China Court Network. Available online: https://www.chinacourt.org/article/detail/2014/12/id/1519518.shtml (accessed on 31 July 2020).
15. Laufer, W.S. Social accountability and corporate greenwashing. *J. Bus. Ethics* **2003**, *43*, 253–261. [CrossRef]
16. Scherer, A.G.; Palazzo, G.; Seidl, D. Managing legitimacy in complex and heterogeneous environments: Sustainable development in a globalized world. *J. Manag. Stud.* **2013**, *50*, 259–284. [CrossRef]
17. Walker, K.; Wan, F. The harm of symbolic actions and green-washing: Corporate actions and communications on environmental performance and their financial implications. *J. Bus. Ethics* **2012**, *109*, 227–242. [CrossRef]
18. Balluchi, F.; Lazzini, A.; Torelli, R. CSR and Greenwashing: A Matter of Perception in the Search of Legitimacy. In *Accounting, Accountability and Society*; Del Baldo, M., Dillard, J., Baldarelli, M.G., Ciambotti, M., Eds.; Springer: Cham, Switzerland, 2020; pp. 151–166. [CrossRef]

19. Parguel, B.; Benoît-Moreau, F.; Larceneux, F. How sustainability ratings might deter 'greenwashing': A closer look at ethical corporate communication. *J. Bus. Ethics* **2011**, *102*, 15–28. [CrossRef]

20. Bernardi, C.; Stark, A.W. Environmental, social and governance disclosure, integrated reporting, and the accuracy of analyst forecasts. *Br. Account. Rev.* **2018**, *50*, 16–31. [CrossRef]

21. Cho, C.H.; Patten, D.M. The role of environmental disclosures astools of legitimacy: A research note. *Account. Organ. Soc.* **2006**, *32*, 639–647. [CrossRef]

22. Clarkson, P.M.; Li, Y.; Richardson, G.D.; Vasvari, F.P. Does itreally pay to be green? Determinants and consequences of proactive environmental strategies. *J. Account. Public. Pol.* **2010**, *30*, 122–144. [CrossRef]

23. Tian, X.L.; Guo, Q.G.; Han, C.; Ahmad, N. Different extent of environmental information disclosure across Chinese cities: Contributing factors and correlation with local pollution. *Glob. Environ. Chang.* **2016**, *39*, 244–257. [CrossRef]

24. Li, C.S.; Wong, C.W.Y.; Yang, C.C.; Shang, K.C.; Lirn, T.C. Value of supply chain resilience: Roles of culture, flexibility, and integration. *Int. J. Phys. Distr. Log.* **2019**, *50*, 80–100. [CrossRef]

25. Pellathy, D.A.; In, J.; Mollenkopf, D.A.; Stank, T.P. Middle-range theorizing on logistics customer service. *Int. J. Phys. Distr. Log.* **2008**, *48*, 2–18. [CrossRef]

26. Lv, W.D.; Zhao, Y.; Wei, Y. Resilience risk management: Organizational management techniques for dealing with uncertain situations. *Manag. World* **2019**, *9*, 116–132.

27. McAslan, A. *Organizational Resilience: Understanding the Concept and Its Application*; Torrens Resilience Institute: Adelaide, Australia, 2010.

28. Oxford Dictionary. Available online: http://oxforddictionaries.com (accessed on 30 July 2020).

29. Beermann, M. Linking corporate climate adaptation strategies with resilience thinking. *J. Clean. Prod.* **2010**, *19*, 836–842. [CrossRef]

30. Wied, M.; Oehmen, J.; Welo, T. Conceptualizing resilience in engineering systems: An analysis of the literature. *Syst. Eng.* **2020**, *23*, 3–13. [CrossRef]

31. Rumson, A.G.; Garcia, A.P.; Hallett, S.H. The role of data within coastal resilience assessments: An East Anglia, UK, case study. *Ocean Coast. Manag.* **2020**, *185*, 105004. [CrossRef]

32. Yonson, R.; Noy, I. Disaster Risk Management Policies and the Measurement of Resilience for Philippine Regions. *Risk. Anal.* **2020**, *40*, 254–275. [CrossRef] [PubMed]

33. Reason, J. Human error: Models and management. *Brit. Med. J.* **2000**, *320*, 768–770. [CrossRef]

34. Toft, Y.; Dell, G.; Klockner, D.K.; Hutton, A. Models of causation safety. In *The Core Body of Knowledge for Generalist OHS Professionals*; Safety Institute of Australia: Tullamarine, Australia, 2012.

35. Arminen, I.; Auvinen, P.; Palukka, H. Repairs as the last orderly provided defense of safety in aviation. *J. Pragmat.* **2010**, *42*, 443–465. [CrossRef]

36. Underwood, P.; Waterson, P. Systemic accident analysis: Examining the gap between research and practice. *Accid. Anal. Prev.* **2013**, *55*, 154–164. [CrossRef]

37. Larouzee, J.; Le Coze, J.C. Good and bad reasons: The Swiss cheese model and its critics. *Saf. Sci.* **2020**, *126*, 104660. [CrossRef]

38. Wu, S.; Hrudey, S.; French, S.; Bedford, T.; Soane, E.; Pollard, S. A role for human reliability analysis (HRA) in preventing drinking water incidents and securing safe drinking water. *Water Res.* **2009**, *43*, 3227–3238. [CrossRef] [PubMed]

39. Miao, X.; Tang, Y.H.; Wong, C.W.Y.; Zang, H. The latent causal chain of industrial water pollution in China. *Environ. Pollut.* **2015**, *196*, 473–477. [CrossRef]

40. Tang, Y.H.; Wu, S.M.; Miao, X.; Pollard, S.J.T.; Hrudey, S.E. Resilience to evolving drinking water contamination risks: A human error prevention perspective. *J. Clean. Prod.* **2013**, *57*, 228–237. [CrossRef]

41. Mitchell, L.D.; Ramey, W.D. Look how green I am! An individual-level explanation for greenwashing. *J. Appl. Bus. Econ.* **2011**, *12*, 40–45.

42. Stephan, M. Environmental information disclosure programs: They work, but why? *Soc. Sci. Quart.* **2002**, *83*, 190–205. [CrossRef]

43. Longhurst, T.M.; Siegel, G.M. Effects of Communication Failure on Speaker and Listener Behavior. *J. Speech Hear Res.* **1973**, *16*, 128–140. [CrossRef]

44. McDaniels, T.; Chang, S.; Cole, D.; Mikawoz, J.; Longstaff, H. Fostering resilience to extreme events within infrastructure systems: Characterizing decision contexts for mitigation and adaptation. *Glob. Environ. Chang.* **2008**, *18*, 310–318. [CrossRef]

45. Seligsohn, D.; Liu, M.D.; Zhang, B. The sound of one hand clapping: Transparency without accountability. *Environ. Polit.* **2018**, *27*, 804–829. [CrossRef]

46. Li, G.Q.; He, Q.; Shao, S.; Cao, J.H. Environmental non-governmental organizations and urban environmental governance: Evidence from China. *J. Environ. Manag.* **2017**, *206*, 1296–1307. [CrossRef] [PubMed]

47. IPE; NRDC. Environmental Information Disclosure: Moving Towards Normalization 2017–2018 Annual Report of Pollution Information Transparency Index (PITI) for 120 Cities. Available online: http://wwwoa. ipe.org.cn//Upload/201904190423050506.pdf (accessed on 20 February 2020).

48. Meister, D. *Human Factors: Theory and Practice*; Wiley and Sons Inc.: Piscataway, NJ, USA, 1971.

49. Swain, A.D.; Guttmann, H.E. *Handbook of Reliability Analysis with Emphasis on Nuclear Plant Applications*; Technical report NUREG/CR-1278; NUclear REGulatory Commission: Washington, DC, USA, 1983.

50. Reason, J. *Human Error*; Cambridge University Press: Cambridge, UK, 1990.

51. IPE; NRDC. Closing Longstanding Gaps: 2016–2017 Pollution Information Transparency Index (PITI). Available online: http://wwwoa.ipe.org.cn//Upload/201804080150204404.pdf (accessed on 23 February 2020).

52. IPE; NRDC. Gaining Momentum, Towards Breakthroughs: 2015–2016 Pollution Information Transparency Index (PITI). Available online: http://wwwoa.ipe.org.cn//Upload/201707100159421179.pdf (accessed on 2 February 2020).

53. Wang, J.L.; Na, Q. Transmission failure and reconstruction in China's environmental pollution. *J. Mass Commun. China* **2019**, *9*, 43–50. [CrossRef]

54. IPE; NRDC. Breakthroughs & Beginnings: The 2013–2014 Pollution Information Transparency Index (PITI)Fifth Annual Assessment of Environmental Transparency in 120 Chinese Cities. Available online: http://wwwoa.ipe.org.cn//Upload/PITI2013EN-final-.pdf (accessed on 23 February 2020).

55. Du, X.Q.; Jian, W.; Zeng, Q.; Du, Y.J. Corporate environmental responsibility in polluting industries: Does religion matter? *J. Bus. Ethics* **2014**, *124*, 485–507. [CrossRef]

56. Nicholas, P.; Allen, B.; Thomas, L.; Urvashi, N. Does disclosure reduce pollution? evidence from India's green rating project. *Environ. Res. Econ.* **2011**, *50*, 131–155. [CrossRef]

57. Siano, A.; Vollero, A.; Conte, F.; Amabile, S. 'More than words': Expanding the taxonomy of greenwashing after the Volkswagen scandal. *J. Bus. Res.* **2016**, *71*, 27–37. [CrossRef]

58. Zheng, S.Q.; Wan, G.H.; Sun, W.Z.; Luo, D.L. Public Pressure and Cities' Environmental Management. *Manag. World* **2013**, *6*, 72–84. (In Chinese)

59. Marquis, C.; Toffel, M.W.; Zhou, Y.H. Scrutiny, norms, and selective disclosure: A global study of greenwashing. *Organ. Sci.* **2016**, *27*, 483–504. [CrossRef]

60. Ramus, C.A.; Montiel, I. When are corporate environmental policies a form of greenwashing? *Bus. Soc.* **2005**, *44*, 377–414. [CrossRef]

61. Zhang, B.; Cao, C. Policy: Four gaps in China's new environmental law. *Nature* **2015**, *517*, 433–434. [CrossRef]

62. Li, S.H.; Song, X.Z.; Wu, H.Y. Political connection, ownership structure, and corporate philanthropy in china: A strategic-political perspective. *J. Bus. Ethics* **2015**, *129*, 399–411. [CrossRef]

63. Patriotta, G.; Gond, J.; Schultz, F. Maintaining legitimacy: Controversies, orders of worth, and public justifications. *J. Manag. Stud.* **2011**, *48*, 1804–1836. [CrossRef]

64. Golant, B.D. The constitution of organizational legitimacy: A narrative perspective. *Organ. Stud.* **2007**, *28*, 1149–1167. [CrossRef]

65. Palazzo, G.; Scherer, A.G. Corporate legitimacy as deliberation: A communicative framework. *J. Bus. Ethics* **2006**, *66*, 71–88. [CrossRef]

66. IPE; NRDC. New Mindsets, Innovative Solutions: 2014–2015 Annual PITI Assessment. Available online: http://wwwoa.ipe.org.cn//Upload/201603150432129195.pdf (accessed on 20 February 2020).

67. Cheng, Z.H.; Wang, F.; Keung, C.; Bai, Y.X. Will corporate political connection influence the environmental information disclosure level? Based on the panel data of a-shares from listed companies in shanghai stock market. *J. Bus. Ethics* **2017**, *143*, 209–221. [CrossRef]

68. Kim, S. The Process Model of Corporate Social Responsibility (CSR) Communication: CSR Communication and its Relationship with Consumers' CSR Knowledge, Trust, and Corporate Reputation Perception. *J. Bus. Ethics* **2017**, *154*, 1143–1159. [CrossRef]

69. Luria, G.; Gal, I.; Yagil, D. Employees' willingness to report service complaints. *J. Serv. Res.* **2009**, *12*, 156–174. [CrossRef]

70. Meng, T.; Pan, J.; Yang, P. Conditional receptivity to citizen participation: Evidence from a survey experiment in China. *Comp. Polit. Stud.* **2014**, *50*, 399433. [CrossRef]

71. Luo, B.; Liu, X.; Wang, C. Incentive compatibility mechanism of enterprise group performance information management. *Oper. Res. Manag. Sci.* **2013**, *22*, 216–220.

72. Villasenor, E.; Bolland, L.P.; Fernandez, G.R. Capacities for developing adaptive management strategies: The case of the Calakmul municipality. *J. Environ. Plann Man.* **2018**, *61*, 2280–2297. [CrossRef]

73. Barasa, E.; Mbau, R.; Gilson, L. What Is Resilience and How Can It Be Nurtured? A Systematic Review of Empirical Literature on Organizational Resilience. *Int. J. Health Policy Manag.* **2018**, *7*, 491–503. [CrossRef]

74. Vedeld, T.; Coly, A.; Ndour, N.M.; Hellevik, S. Climate adaptation at what scale? Multi-level governance, resilience, and coproduction in Saint Louis, Senegal. *Nat. Hazards* **2016**, *82*, S173–S199. [CrossRef]

75. Edmunds, K.L.; Elrahman, S.A.; Bell, D.J.; Brainard, J.; Dervisevic, S.; Fedha, T.P.; Few, R.; Howard, G.; Lake, I.; Maes, P.; et al. Recommendations for dealing with waste contaminated with ebola virus: A hazard analysis of critical control points approach. *Bull. World Health Organ.* **2016**, *94*, 424–432. [CrossRef]

76. Boston-Fleischhauer, C. Enhancing healthcare process design with human factors engineering and reliability science, part 2: Applying the knowledge to climical documentation systems. *J. Nurs. Adm.* **2008**, *38*, 84–89. [CrossRef] [PubMed]

77. Tang, Y.; Miao, X.; Zang, H.; Gao, Y. Information disclosure on hazard from industrial water pollution incidents: Latent resistance and counter measures in China. *Sustainability* **2018**, *10*, 1475. [CrossRef]