

Study on Environmental Risk Communication Capability: An Important Approach to the Governance of Environmental Mass Incidents

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Abstract: Environmental mass incidents start with environmental risks and end with the elimination of environmental risks. There is a gap between the public's perception of environmental facility or project risks and the actual risks. This gap and the resulting choice of risk behaviors are crucial factors leading to the occurrence of environmental mass incidents. Based on the approach of enhancing environmental risk communication, a comprehensive strategy is proposed, including improving public participation in environmental public decision-making, strengthening the environmental risk communication platform, enhancing environmental science popularization and education, rebuilding the trust community of environmental risk communication, and strengthening the risk communication effectiveness of new media. These measures aim to reduce the public's cognitive bias towards environmental risks and contribute to more effective governance of environmental mass incidents.

1. Introduction

Environmental mass incidents typically refer to collective and confrontational rights protection actions triggered by factors such as environmental pollution and environmental safety risks. In recent years, many parts of China have witnessed frequent environmental mass incidents, showing a rapid growth trend and an escalation in confrontations. Why do proposed or under-construction environmental facilities that have not yet caused pollution often face strong resistance from the public? Why do the public often feel fear even towards PX-type environmental facilities that have low risks and reliable technologies? Preliminary investigations and case analyses have revealed that there is a cognitive bias in the public's perception of environmental risks, leading to an exaggeration of risks. This is an important factor that cannot be ignored and is rarely seen in other mass incidents primarily driven by economic interests. It reflects the uniqueness of the causes of environmental mass incidents. Therefore, the governance of environmental mass incidents cannot avoid the factors related to environmental risk perception. Environmental risk communication is an essential means to reduce cognitive biases in environmental risk perception and establish an objective and scientific understanding of environmental risks. Understanding and grasping the causes and developments of environmental mass incidents from the perspective of public risk perception and communication is the logical starting point for governing such incidents.

2. Cognitive Bias in Environmental Risk Perception: The Unique Causes of Environmental Mass Incidents

What are the causes of environmental mass incidents? Is there any difference between the causes of environmental mass incidents and non-environmental mass incidents? Existing theoretical research has formed a basic consensus: the fundamental reasons for environmental mass incidents are mainly due to the improper handling of the relationship between political achievements, economic development, and environmental ecological protection. The immediate causes or inducements mainly include the increase in public environmental awareness and rights awareness, environmental information opacity, formalization of environmental impact assessments and stability assessments, insufficient public participation, limited channels for public interest appeals, weak social self-regulation capabilities, and cognitive biases in risk perception, among others. Non-environmental mass incidents, such as those caused by factors like land requisition, housing demolition, labor disputes, etc., are primarily due to conflicts over economic interests, with almost no relation to environmental risk issues. Although there are some similarities in certain direct and specific reasons between the two, the overall differences between the causes of environmental mass incidents and non-environmental mass incidents are significant. The most significant differentiating factor is risk perception. A large amount of evidence indicates that environmental mass incidents are triggered by public concerns and even fears about the safety and health of their living environment. The reason for this is their significant doubts about the risks of environmental pollution and the safety risks associated with the construction of environmental facilities. This involves the issue of the public's perception of environmental risks.

Environmental risk perception generally refers to the understanding and anticipation of the potential harm to the environment, public health, and safety by the subjects. It involves a series of psychological activities, including sensation, perception, memory, thinking, and imagination. The occurrence of environmental mass incidents "is not only rooted in the events themselves but also in the public's perception, acceptance, understanding, and response to crisis events." [1] It can be seen that environmental risk perception itself is subjective. If the public is influenced by various internal and external factors, cognitive biases and the exaggeration of risks are inevitable. Bias implies the existence of a comparative standard, and cognitive biases in environmental risk perception may come from two aspects: one is the difference between the public's subjective judgment of environmental risk and the actual objective risk, and the other is the difference between the public's environmental risk perception and the risk perception of government departments or experts. [2] Certainly, the risk perception of government departments or experts is still subjective and may have deviations from the actual objective risk, and it cannot be used as the statutory standard for risk assessment. In reality, the cognitive bias in risk perception that triggers environmental mass incidents mainly falls within the subjective risk perception of the public and the deviation from actual risk. Often, the public's subjective risk perception exceeds the actual risk, which belongs to the category of risk amplification bias. It can be seen that environmental mass incidents originate from environmental risks and end with the elimination of environmental risks. In summary, the cognitive bias in environmental risk perception is a specific cause of environmental mass incidents and is an important factor in understanding and solving the governance challenges of environmental mass incidents.

3. Interaction: The Formation Causes of Environmental Risk Perception Bias

Environmental risk perception bias refers to a deviation or tendency to deviate when assessing and judging environmental pollution and facility risks. The reason for this deviation lies in the fact that risk perception is an individual's subjective perception, experience, and understanding of various objective risks in the external environment based on intuitive risk judgments. Although environmental

risk perception is based on objective risks and has a certain objectivity, it is ultimately a subjective construction of risks by the public and inevitably possesses a certain subjectivity.

The perception bias of environmental risks is the result of the interaction of various subjective and objective factors. Environmental risk perception is not only influenced by the risk characteristics of environmental issues themselves (such as the nature of the risk, the probability of occurrence, the severity of risk consequences, the controllability of risk, the acceptability of risk, etc.), but it is also influenced by individual traits, individual knowledge and experience, media reports, pseudoscientific rumors, and so on. The factors on which the public's perception of environmental risk is based may not necessarily be objective, comprehensive, or scientific, which inevitably leads to a bias in environmental risk perception.

In recent years, a series of typical environmental mass incidents that have occurred in China have confirmed that the public's perception of environmental facility risks is often based on intuition or past experiences rather than relying on scientific thinking. Due to the limited or even lack of scientific knowledge among the public, it is difficult or even impossible for them to objectively and fairly measure and assess environmental risks like experts and scholars using scientific knowledge and advanced assessment techniques. The knowledge applied by the public in risk situations is based on intuition and past social cognition. When pre-formed perceptions such as "PX is highly toxic," "PX can cause cancer," or "PX projects are high-risk" are awakened and activated in the minds of the public, they will take collective action to strongly oppose environmental projects. It can be seen that the bias in environmental risk perception is an essential factor in the causes of environmental mass incidents, which is a significant difference between environmental mass incidents and other non-environmental group events in terms of their causes. Events such as land acquisition, housing demolition, labor disputes, and other factors that trigger group incidents are primarily due to the public's demands for economic interests, without involving their demands for their living environment and health safety. Therefore, environmental mass incidents cannot be solved through a single economic means.

4. Comprehensive Strategies: Enhancing Environmental Risk Communication Capability

Effective risk communication can provide emotional support to correct cognitive biases and is a key mechanism for encouraging stakeholders to think rationally and empathetically. The primary goal of risk communication is to achieve consensus in risk perception by eliminating differences in risk perception among various stakeholders through scientific communication. This, in turn, effectively reduces the likelihood of environmental mass incidents.

4.1 Improving Public Participation in Environmental Public Decision-Making

The current problems with public participation in environmental public decision-making are not due to the lack of relevant legal basis or opposition from relevant departments in practice. Instead, the main issue lies in the prominence of formalism and the low effectiveness of participation. The key challenge in improving public participation in environmental public decision-making is to transition from limited participation to effective participation.[3]

First, it is essential to strengthen the concept of substantive public participation. Substantive public participation means ensuring that the public truly participates, participates fully, and their involvement remains genuine and unadulterated. If the motivation for public participation in environmental decision-making is driven solely by the requirements of existing regulations or to avoid administrative accountability, then the participation is likely to suffer from formalism and perfunctoriness. Only by genuinely establishing the status of the public as subjects and the primacy of their rights can we sincerely hope for public participation, actively invite public involvement, and

regard the public as partners and a community of shared interests rather than adversaries or disruptors.

Second, establish a comprehensive process mechanism for public participation in environmental public decision-making. The concept of environmental public decision-making is broad and lengthy, encompassing not only environmental facility projects but also various stages and processes beyond environmental impact assessments and feasibility evaluations. Environmental public decision-making covers decisions on public issues at different stages, including environmental ecology and pollution control, environmental development planning, site selection for environmental projects, and the approval and construction phases. The role of establishing a comprehensive process mechanism is to achieve source control of risks, comprehensive management, and step-by-step reduction.

Third, gradually address the issue of the legal effectiveness of public opinions. Currently, while there are no institutional barriers to public participation in environmental public decision-making, there is a lack of clear legal support for the extent of influence and veto power of public opinions in such decisions. According to current regulations related to environmental impact assessments and feasibility evaluations, public opinions are only considered as a reference for decision-making and do not have veto power. On one hand, this can lead government departments or project developers to disregard widespread public opposition and proceed with controversial projects for local or organizational interests. On the other hand, it can make public participation seem superficial and dampen the enthusiasm for involvement. Therefore, strengthening the authority of public opinions, including potentially having a vetoing role in certain environmental decisions, requires further improvement of relevant regulations.

4.2 Establishing a Comprehensive Environmental Risk Communication Platform

The Environmental Risk Communication Platform enhances the understanding, monitoring, and management of environmental risks among the public, government, research institutions, and environmental organizations by collecting, processing, transmitting, and interpreting information and data.

First, improve the environmental risk assessment mechanism, adhere to the principle of risk assessment taking precedence, and establish a synergy between prevention and resolution. [4] Environmental risk information is typically comprehensive and complex. Therefore, before conducting risk communication, a risk assessment must be carried out. Risk assessment plays a crucial role in risk communication. Currently, in China, environmental risk assessment work is scattered among different management departments and institutions. This dispersion can lead to repetitive assessments of the same environmental objects, resulting in a waste of societal resources. Therefore, it is necessary to integrate dispersed functions related to risk assessment and early warning, establish relevant competent authorities to achieve unified management of environmental risk assessment work, and ensure that assessment outcomes are shared among various levels and departments. Before conducting environmental risk assessments, it is essential to clearly define and identify stakeholders related to the project and further expand and specify assessment contents. Additionally, guidelines on accident probability should be published, and they should be regularly updated.

Second, establish specialized risk communication agencies. From the government's perspective, it is possible to draw lessons from the food risk communication mechanism. Environmental protection departments at all levels, as well as administrative agencies related to the environment, should establish dedicated risk communication offices and regularly carry out relevant activities. These activities include providing popular science publicity on environmental issues to the public, organizing campus propaganda activities like "school tours," conducting systematic environmental risk communication activities, and providing professional explanations to the public regarding

frequent environmental group events in society to reduce public panic. From a corporate perspective, it is also possible to organize supervisory committees representing the public, set up public visitation days, and actively accept supervision from government bodies and the public.

4.3 Strengthen environmental science popularization and education campaigns

The function of environmental science popularization and education campaigns primarily aims to enhance the scientific knowledge of society and the public, promote a rational understanding of environmental pollution issues and the safety risks associated with environmental facilities, correct cognitive biases regarding risks, and prevent the spread of pseudoscientific rumors. The current issue with environmental science popularization and education campaigns is not the lack of popularization but rather the effectiveness of these efforts. Science popularization and education campaigns are essentially a form of mass communication of scientific knowledge and should possess the general characteristics and processes of mass communication, in line with the general principles and requirements of mass communication.

First, the authority of the subjects in environmental science popularization and education is one of the important factors influencing the effectiveness of science popularization. This authority is not solely determined by the status, fame, and social influence of the institutions or expert subjects, but also influenced by the relevance of the subject's identity to the content of science popularization and the level of professionalism. For crisis science popularization, the effectiveness of popularization is not only related to the authority of the subject but also influenced by the relationship between the subject and the crisis event. During a crisis period, the independence of the subject's identity is positively correlated with the effectiveness of science popularization and education campaigns. Therefore, when conducting environmental crisis science popularization and education, it is necessary to maintain the unity of the authority and independence of the subject. When conducting science popularization and education campaigns on the safety of environmental facilities and the hazards of environmental pollution issues, it is not enough to involve only government departments, companies, and their invited experts who have vested interests. It is also essential to invite independent and authoritative third-party institutions or experts to participate.

Second, media and methods are crucial influencing factors for the effectiveness of environmental science popularization and education. In addition to continuing to rely on traditional mass media, it is also important to effectively utilize various forms of new media, construct an integrated media science popularization communication model, and enhance the coverage and acceptance of environmental scientific knowledge among the audience. Efforts should be made to innovate and diversify science popularization and education methods, utilizing formats that appeal to the general public. By combining traditional and modern means of expression, the goal is to maximize the effectiveness of science popularization while achieving a harmonious balance between scientific content and accessibility, as well as theoretical knowledge and practical application.

4.4 Rebuilding the Trust Community of Environmental Risk Communication

The Relationship Between Social Trust and Risk Communication is Close. Without social trust, it is difficult to achieve consensus on environmental risk perception, and there may be a situation of "communication" without "communication." The reason for the formation of cognitive biases in environmental risk communication is the insufficient credibility of the government, neighboring avoidance companies, and scientific experts. Therefore, it is necessary to rebuild a trust community by increasing the investment of social capital to eliminate cognitive biases in risk communication.[5]

First, the public's right to know and their level of participation are crucial for their support or opposition to environmental facilities. Despite regulations related to public participation and

transparency of information, these regulations often lack effective enforcement. In some areas, certain projects are often restricted from public knowledge, citing national security as a reason. However, projects with higher levels of opposition typically have less transparent information and limited public involvement in the early planning stages. This secretive approach often leads to public mistrust and a sense of insecurity. Second, nurture environmental nonprofit organizations and introduce third-party regulatory agencies through outsourcing services to establish a third-party trust system to compensate for the lack of credibility in government environmental regulation and self-regulation by businesses. On one hand, fully utilize the independent supervisory functions of nonprofit environmental organizations. On the other hand, government departments can purchase services to leverage the expertise of professional environmental service companies. These service companies can provide environmental services and solutions such as information platform construction and standardized operational supervision. They not only possess technical authority but also maintain a fair and objective stance, and their professional input helps enhance the transparency of environmental regulation. Third, establish a sound system for the environmental protection dishonesty blacklist. Those neighboring and evading companies included in the blacklist should not only face penalties in environmental aspects such as production stoppage for rectification, downgrading of environmental credit ratings, and denial of special funds but also be subject to supervision and penalties from relevant government departments and social organizations. Fourth, technology experts should maintain a neutral and fair position, avoiding getting involved in behaviors that could "hijack" public risk perception through technology and refraining from playing the role of mere "advocates."

4.5 Enhancing the Risk Communication Efficacy of New Media

As an important channel for authorities to communicate risks with the public, the media plays an indispensable role in guiding the public to objectively and rationally perceive the risks associated with environmental facilities or projects. Currently, platforms dominated by new media such as Weibo, WeChat, and Douyin have risen dramatically, becoming platforms that the public is willing to receive information from.

First, it is important to achieve the organic integration of traditional media and new media, with a particular emphasis on effectively utilizing new media. The rapid development of new media facilitates communication and coordination among different stakeholders. However, regulating new media presents certain challenges and can easily become a channel for the dissemination of pseudoscience and rumors. If new media is not effectively regulated, it may mislead the public's risk perception and judgment. Therefore, there is a need to standardize the behavior of new media, purify new media platforms, curb the generation and dissemination of rumors, in order to reduce the public's bias in risk perception and eliminate panic about environmental facilities or projects. Government departments at all levels and mainstream media should actively publish authoritative information on official microblogs and WeChat to guide public opinion. Second, utilizing the advantages of the media to enhance interaction with the public is essential. It is important to actively respond to the public's demands, achieve two-way communication, and promptly address the public's concerns and anxieties regarding risks.

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