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On the Coverage Scope of Major Risks in Preventive Environmental Public Interest Litigation

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Abstract

When determining the coverage scope of major risks in preventive environmental public interest litigation, judgments need to be made from both factual and legal aspects. In the factual aspect, major risks must simultaneously satisfy a high degree of probability and severity of damage. In the legal aspect, the principle of proportionality and the principle of prevention can limit the scope of high probability and severity of damage; in specific cases, the identification subject of major risks, dangerous behaviors, behavioral consequences and causal relationships should be determined; judges can determine the coverage scope of major risks through factual recognition and value judgment.

Keywords

Preventive environmental public interest litigation, Major risks, Coverage scope

1. Introduction

In August 2022, the Intermediate People's Court of Jinan Railway Transportation accepted a case involving the disposal of a discarded gamma knife by three hospitals. The People's Procuratorate of Jinan City filed a preventive environmental civil public interest lawsuit in advance to actively avoid the occurrence of damage results (Wang & Yan, 2023, p. 1). This case was finally judged by the Higher People's Court of Shandong Province in June 2023. This is the first preventive civil public interest lawsuit for radioactive pollution in the country. The application of preventive environmental public interest litigation to the response to environmental risks of radioactive pollution can avoid the occurrence of actual harm from radioactive pollution and ensure environmental safety.

Compared with the post-remedy environmental public interest litigation that sues for judicial relief after polluting the environment, destroying the ecology and causing damage to the social public interest, preventive environmental public interest litigation can target "behaviors that pollute the environment and destroy the ecology with major risks of damaging the social public interest", which is more in line

with the principles of giving priority to protection and prevention in environmental law. It can prevent environmental risks from transforming into damage, reduce major social conflicts caused by environmental problems, and protect citizens' procedural environmental rights. However, by examining the judicial practice of preventive environmental public interest litigation, the number of preventive cases is extremely small, and judicial organs still maintain judicial passivity and the background of "passive response". The reason lies in the fact that the existing laws and regulations are too vague about major risks, making it difficult for courts to make a determination and thus apply preventive litigation. Therefore, it is particularly necessary to clarify the coverage scope of major risks.

2. The Cognitive Approach to the Concept of Major Risks

To clarify the concept of major risks, it is necessary to start with the meaning of the term "major risks" and provide explanations, that is, to examine the meaning of major risks from the perspective of semantics. Thus, it is necessary to focus on the core of major risks, that is, risks.

2.1 The Attribute of Major Risks-Uncertainty

In ancient times, when fishermen went fishing at sea and encountered stormy weather, there were often many uncertain factors. There was a high possibility of dangers such as running aground and fishermen falling into the water. The existence of wind was often accompanied by the emergence of danger. Danger arose because of the wind; where there was wind, there was danger. Early risks were often natural, objective events that did not depend on human will, and risks entailed danger and concealed the possibility of damage occurring. However, risks were uncertain. Whether the danger and damage contained therein occurred or not was unknown to people. People could only rely on the judgment of daily experience to infer the probability of the occurrence of danger and damage. After the development of the Industrial Revolution in modern society, humans, with the help of science and technology, could have a deeper understanding of nature and to a certain extent, could utilize and develop nature more proficiently. As humans became more proficient in the development and utilization of nature, the risks generated by this behavior became increasingly complex and diverse. Modern risks are the most obvious external characteristics of industrialization and modernization and are a kind of potential side effect (Ulrich Beck, 2004, p. 36). The dangers that people were difficult to come into contact with and recognize in their production and life in the past are gradually revealing their true nature along with the improvement of people's awareness of risks.

When risks are manifested in the environmental field, they are environmental risks. Modern people have reached a relatively mature level in the development and utilization of nature. At this time, in human production and life, risks are manifested as the inherent natural environmental risks since ancient times and the man-made environmental risks associated with human development and utilization activities of nature. And due to the frequent human production and life activities, the impact of man-made environmental risks on humans is more intense. Therefore, the environmental risks mentioned in this article are all man-made environmental risks. Environmental risks have become an

objectively existing huge challenge in the process of human ecological civilization construction and modernization of environmental governance (Liu, 2021, pp. 37-48, p. 111). However, compared with the helplessness of early humans in the face of natural environmental risks, humans in modern society can use science and technology and combine the inherited empirical rationality to have a certain perception and understanding of environmental risks. On this basis, it is meaningful to discuss the coverage scope of major environmental risks. Therefore, based on the existing science and technology and empirical rationality, to understand major environmental risks, it is necessary to clarify the characteristics of major environmental risks in terms of the possibility and degree of damage.

2.2 The Possibility of Causing Damage from Major Risks—A High Probability of Causing Damage

In modern society, people's production and life activities are constantly creating all kinds of risks all the time, but this does not mean that the development of modern society should come to a standstill because of the existence of risks. Risk is only an objectively existing uncertain fact, and whether it occurs is in an uncertain state. Blindly being afraid of risks will lead humanity into the misunderstanding of fearing development due to choking while eating, but this does not mean that we should let risks go and ignore their existence.

The correct approach should be to delineate the possibility level of damage caused by risks, that is, the probability of damage occurrence. Among this risk level, danger is at the first level and is the situation with the greatest possibility of causing damage, that is, within a short period of time, a certain state caused by a certain behavior will, under people's empirical expectations and scientific proofs, lead to the actual occurrence of damage. Risk is at the second level and is a situation with a moderate possibility of causing damage, that is, it is difficult to determine whether damage will occur in a short period of time through people's empirical expectations and scientific proofs. Residual risks have the third level, which represents a lower possibility of damage, that is, based on people's empirical expectations and scientific proofs, it is determined that damage will not occur within a certain period of time.

Through the description of the possibility of damage caused by risks, it can be found that the probability of causing damage by danger, risk and residual risk decreases in turn. Danger is at full probability, followed by risk, and residual risk is at low probability. At this time, we can discuss the probability of causing damage by major risks. The probability of major risks should be between danger and risk, belonging to the high probability level of causing risks. Therefore, the major risks targeted by preventive environmental public interest litigation should be major environmental risks with a high probability of causing damage.

2.3 The Degree of Damage Caused by Major Risks—Serious or Difficult to Recover from the Damage Caused

After clarifying that major environmental risks should have the characteristic of a high probability of actually causing environmental damage, it is also necessary to discuss the possible consequences after the actual occurrence of this environmental damage. This consequence can be described from two

aspects: the depth and breadth of the impact of damage caused by major risks.

2.3.1 The Depth of the Impact of Damage Caused by Major Risks

The damage caused by major risks needs to reach a certain degree. This degree, in terms of the depth of the impact of the damage, is manifested as a serious negative impact on the environment, or the damage caused is difficult to repair through existing technical means, that is, it exceeds the carrying capacity of the environmental carrying capacity or threatens the survival of highly valuable organisms. Environmental carrying capacity refers to the threshold of human activities that the system can withstand under the condition that the composition, structure and function of the ecological environment system do not deteriorate and are in a virtuous cycle and development in a certain region during a certain period (Zhu, Xie & Li, 2017, pp. 7039-7047).

The environment itself has a certain ability to recover and purify, and can withstand the vast majority of human production and life behaviors. For the ecology and polluted environment that have been damaged by human development and utilization behaviors, they can also gradually restore their carrying capacity through self-repair for a certain period of time. For example, during the ten-year fishing ban on the Yangtze River, by 2022, the number of fish species in the mainstream of the Yangtze River has increased by 14, and the number and weight have also shown a gradually increasing trend (Zhou, 2023, pp. 54-56). Therefore, when measuring behaviors with major risks, the risks caused by major risks should threaten the environmental carrying capacity, that is, the environmental capacity will be significantly weakened and difficult to recover within a certain period of time.

At the same time, in addition to considering the impact on the environmental carrying capacity, it is also necessary to assess the impact of major risk behaviors on the survival of highly valuable organisms. For example, in the case of the Green Peacock, the court determined that if the first-level hydropower station on the Jasajiang River continues to be constructed, the submerged area of the project in question will inevitably lead to the habitat of the national first-level key protected animal, the Green Peacock, and the habitat of the national first-level key protected plant, Cycas tanqingii, being submerged. There is no doubt about the possibility of a major risk to the biological habitat. It can be seen that when it threatens the survival of rare organisms with high environmental value, ecological value, and economic value, it can be determined that this situation meets the circumstances of major risks. Therefore, it can be described that the depth of the impact of damage caused by major risks needs to reach the degree of exceeding the carrying capacity of the environmental carrying capacity or threatening the survival of highly valuable organisms.

2.3.2 The Breadth of the Impact of Damage Caused by Major Risks

To meet the degree requirements of major risks, it can either reach far beyond the environmental carrying capacity in terms of the depth of the impact of the damage caused, or reach the degree of threatening organisms with high environmental value, ecological value, and economic value. It can also be that in terms of the breadth of the impact of the damage caused, it has an impact on areas with a large area or rich ecological environment value. If the area affected by the damage caused by the risk is

a small area that does not have rich ecological environment value, then it cannot be considered that the risk reaches the degree of major risk in terms of the scope of impact. If at this time, the impact depth does not reach the degree of causing the environment in this area to be difficult to recover and the destruction of organisms with high ecological value, it cannot be considered that the risk has reached the degree of major risk in terms of quantity. Conversely, if the developer's utilization behavior will affect a considerable large area or have an impact on areas with rich ecological environment value, it can be determined that this behavior conforms to the behavior of major risks. For example, in the Huilongshan case, the plaintiff claimed that the construction of the dam of the Huilongshan Hydropower Station would seriously damage the ecological environment of the Xiaohei River Basin. The national key protected plants and tropical rainforest vegetation that were not felled and damaged in the reservoir area of the Huilongshan Hydropower Station, the fish migration channels in the Lancang River and Luosuo River basins, and the Xishuangbanna National Nature Reserve were at risk of being destroyed, blocked and submerged. Therefore, the construction behavior of the dam of the Huilongshan Hydropower Station belongs to the category of major risk behaviors.

In conclusion, it can be considered that to determine major environmental risks, it is necessary to simultaneously meet the characteristics of both quality and quantity. In terms of quality, it is necessary to meet the characteristic of a high probability of causing damage. In terms of quantity, it is necessary to meet one of the following conditions: First, in terms of the depth of the damage caused, it exceeds the carrying capacity of the environmental carrying capacity or threatens the survival of highly valuable organisms. Second, in terms of the breadth of the damage caused, it has a significant negative environmental impact on areas with a large area or rich ecological environment value.

3. The Narrowing of the Scope of Major Risks by Legal Principles

By describing the characteristics of major risks, the requirements of major risks in terms of possibility and damage results can be determined. However, at this time, the concept of major risks is still an uncertain concept and needs to be further narrowed by legal principles.

3.1 The Narrowing of the Possibility of Damage Caused by Major Risks by the Principle of Proportionality

When regulating environmental risks, it is very easy to fall into two extremes. On the one hand, there is excessive regulation of risks, and on the other hand, there is insufficient risk regulation. With the help of the principle of proportionality, the scope of major risks can be further narrowed. On the one hand, not all risks caused by the development and utilization behaviors of environmental developers must be identified as major risks. Unlimited protection of the ecological environment, restrictions on the freedom of developers, hindrance to economic and technological development, and incurring high economic costs to monitor and regulate environmental risks; on the other hand, we cannot be inactive and connive at the potential environmental risks to grow wantonly, evolve into major environmental risks, and develop serious or irreversible damage consequences in the future.

The principle of proportionality originated in German police law in the 19th century and was initially mainly used to regulate police powers (Mei, 2020, pp. 57-70). The common view in the academic circle holds that the principle of proportionality includes the principle of suitability, the principle of necessity, and the principle of proportionality, among which the principle of proportionality receives the most attention, that is, the measures adopted must be proportional or commensurate to the purpose achieved (Ni, 2021, pp. 24-38). The narrowing of the scope of major risks through the principle of proportionality is mainly manifested in the narrowing of the possibility of the occurrence of major risks.

With the help of the principle of proportionality, proportionate obligations can be imposed on risk actors for different levels of risks. For danger, the probability of causing damage is full. If the damage it causes is within the tolerance range of the environmental carrying capacity, the natural environment can be repaired through self-purification and other methods within a period of time. At this time, it is not necessary to restrict its behavior by initiating preventive environmental public interest litigation by identifying major risks; if the behavior of the actor may cause serious or irreversible damage, people need to try to avoid it through various means or minimize the impact of the damage as much as possible when it cannot be avoided. For risks, the probability of causing damage is only moderately probable. People only need to monitor it within a certain period of time to ensure that the development status of the risk is under people's control during this period to avoid the actual occurrence of damage. For residual risks, the probability of causing damage is the lowest, and the actual occurrence of damage is almost not caused. The regulation of residual risks will not conform to the cost-benefit principle of economics (Zhang, 2020, pp. 22-30).Therefore, residual risks must be tolerated by society (Zhang, 2017, pp. 164-172).

On the one hand, determine the scope ratio of major risks. Because the probability of damage caused by danger is the highest, danger can be regarded as a more serious major risk and, of course, it belongs to the scope of major risks. During the fermentation process of risks, if it exceeds people's empirical rationality and scientific rationality and is about to enter the uncontrollable category, then it can be considered that the risk is about to transform into a major risk; on the other hand, the measures implemented for risk creators need to be proportionate, adapt to the fulfillment capacity of risk creators, and be in line with the cost-benefit measurement of actors. The cost of actors fulfilling obligations and taking measures should not be greater than the possible benefits they may obtain. When the fulfillment of a certain risk obligation or the implementation of risk prevention measures will bring an unbearable burden to the actor, the actor is allowed and helped to take other alternative measures to undertake the environmental risk obligation.

3.2 The Narrowing of the Degree of Damage Caused by Major Risks by the Precautionary Principle

The precautionary principle was originally stipulated in the German Pollution Control Law. Its initial meaning was that when there was no evidence based on the current level of science and technology to prove that human behavior would indeed cause ecological damage, the state was required to take

preventive measures to prevent possible ecological and environmental damage (Zhao, 2009, pp. 187-211). In 1992, the United Nations Rio Declaration on Environment and Development made a classic exposition of the precautionary principle, that is, in order to protect the environment, all countries should do their best to take preventive measures. When there is a threat of serious or irreversible damage, the lack of sufficient and conclusive scientific evidence shall not be a reason for delaying the adoption of cost-effective measures to prevent environmental deterioration (Wu, Liu & Wang, 2024, pp. 368-375), which is called the weak risk precautionary principle by scholars. The Wingspread Statement emphasizes that when an activity poses a threat to human health and the environment, preventive measures should be taken even if the causal relationship cannot be fully proved scientifically (Chen, 2022, pp. 288-304), which is called the strong risk precautionary principle by scholars.

The precautionary principle is divided into the weak risk precautionary principle and the strong risk precautionary principle in legal norms. The weak risk precautionary principle advocates for limited prevention of limited risks. Before carrying out risk prevention, it is first necessary to consider whether the risk will cause serious or irreversible damage. If it will cause serious or irreversible damage, cost-effective and reasonable measures should be taken for prevention; while the strong risk precautionary principle responds to unlimited risks with unlimited measures. The measures taken during risk prevention do not calculate their costs, and the risks dealt with do not require them to transform into actual damages that meet the serious qualitative requirements. The narrowing effects of these two precautionary principles on major risks are different. If the weak risk precautionary principle is adopted, the risk needs to meet the dual requirements of quality and quantity, that is, both a high probability of causing damage and serious or difficult-to-recover damage results; if the strong risk precautionary principle is adopted, as long as the risk reaches a high probability in terms of quality and there is a possibility of causing damage, then it can be regarded as a major risk without considering whether it reaches the severity or difficulty of recovery of the damage caused in terms of quantity.

When discussing the narrowing of major risks by the risk precautionary principle from the perspective of preventive environmental public interest litigation in China, the perspective of the strong risk precautionary principle should not be applied. Its preventive measures for environmental risks regardless of costs will not only increase a large amount of judicial costs, economic costs and other cost inputs, but also expand the scope of attack on major risks and hinder the development of science and technology and the economy. The perspective of the weak risk precautionary principle should be applied, and the cost-benefit principle should be adopted to presuppose uncertain major risks as certain actual damages and calculate the possible damages and losses; and then through methods such as scientific and technological evaluation and the concepts of the general public to comprehensively evaluate the possibility of major risks transforming into actual damages, so as to narrow the uncertainty of major risks.

4. The Composition of Major Risks in Specific Cases

Through the understanding of the characteristics of major risks themselves and the narrowing of the coverage of major risks by legal principles, the scope of major risks has gradually emerged with clear boundaries. At this time, it is necessary to place the coverage of major risks in the perspective of specific cases, that is, to analyze the identifying subject, dangerous behavior, behavioral outcome and causal relationship of major risks.

4.1 The Identifying Subject of Major Risks

Major risks are proposed in judicial interpretations. Whether it constitutes a major risk belongs to judicial determination, and the judicial power is exercised independently by the court. Therefore, the court is of course the decisive identifying subject (Zhang & Wu, 2020, pp. 138-144). Theoretically, human cognitive ability has no boundaries. However, in a specific field (such as judicial trial), the cognitive subject as an individual is limited by the cognitive object, his own knowledge and other external reasons, and his cognitive ability shows relative limitations (Zhang, 2022, pp. 103-120). Compared with administrative organs, courts do not have professional environmental science knowledge. Administrative organs have environmental protection departments, personnel with specialized knowledge of environmental science, and funds dedicated to supervising environmental protection work, conducting environmental monitoring and assessment and other specialized environmental work.

Limited by specialized knowledge, personnel who make determinations on facts cannot complete judgments beyond their own cognitive abilities (Zhang, 2017, pp. 110-139, p. 206), but this does not mean that judges cannot complete the fact determination of major risks. On the contrary, judges only need to make reasoning under the premise of the law by thinking about the evidence and combining their own life experience. That is, although limited by the particularity of specialized knowledge, judges cannot comprehensively review specialized evidence, but they should still play the role of gatekeepers (Kang, 2023, pp. 76-84). Therefore, it cannot be considered that because courts and individual judges do not have specialized environmental science knowledge, the status of the court as the identifying subject of major risks should be transferred to administrative organs or environmental experts.

4.2 Dangerous Behaviors of Major Risks

In the provisions of judicial interpretations on major risks, major risks can cause ecological damage or environmental pollution. Therefore, the causal behaviors that lead to major environmental risks are required to have environmental illegality (Zhang & Zheng, 2023, pp. 43-56). However, some scholars believe that the Environmental Protection Law clearly stipulates, for obviously wrong behaviors or risky behaviors that may harm the social and public interests, environmental public interest organizations can file civil environmental public interest lawsuits to avoid the occurrence of damage to ecological and environmental rights and interests (Cao & Ma, 2021, pp. 150-160).

Therefore, the causal behaviors of major risks do not necessarily have environmental illegality. Daily production and life behaviors and general environmental development and utilization behaviors may all constitute the causal behaviors of major risks. At the same time, if it is required that the causal behavior of major risks has environmental undiscoveredness, that is, it is required that the damage of ecological damage and environmental pollution actually occurs, and preventive environmental public interest litigation can only be filed based on the actual occurrence of the damage. This not only makes preventive environmental public interest litigation no different from relief-type environmental public interest litigation, but also does not conform to the purpose of preventive environmental public interest litigation to prevent environmental risks. Therefore, defining the causal behaviors of major risks as daily production and life behaviors and general environmental development and utilization behaviors is more in line with the purpose of preventive environmental public interest litigation to prevent risks.

4.3 Behavioral Outcomes of Major Risks

The behavior of major risks points to the actual harm of ecological damage and environmental pollution, and the legal interest harmed is the social public interest. That is, the ecological damage and environmental pollution behaviors that harm the social public interest are major risk behaviors, then the scope of the social public interest needs to be clarified. Currently, in the academic circle, there are the single legal interest infringement theory (Zhu, 2016, pp. 23-31) and the dual legal interest infringement theory regarding the legal interest harmed by major risks.

The single legal interest infringement theory holds that the legal interest harmed by major risks is the public interest of the ecological environment. The dual legal interest infringement theory holds that major risks can not only harm the public interest of the ecological environment, but also harm personal and property interests, or damage both kinds of legal interests simultaneously. In judicial practice, in the case of the Yunnan Oil Refining Project of China National Petroleum Corporation, Friends of Nature believed that the oil refining project of China National Petroleum Corporation Yunnan Petrochemical Co., Ltd. posed a major risk to water, atmosphere and other natural environment elements and human health. In this case, the reasons for the lawsuit filed by the plaintiff included both harm to the social public interest and harm to personal interests; in the case of Acer pentaphyllum, the court held that Acer pentaphyllum was in the Red List of Biodiversity and was a rare wild plant. There might be a potential risk of damaging the original living environment of Acer pentaphyllum in the case-related area and affecting its survival after the completion of the hydropower station, which might thereby damage the social public interest. In this case, the court held that the construction of the hydropower station would harm the social public interest, and thus held that the construction behavior of the hydropower station was a major risk behavior.

The objects threatened by major risks should only include the social public interest. First, according to the provisions of judicial interpretations, only behaviors that pose a major risk to the social public interest fall within the actionable scope of preventive environmental public interest litigation; second, for situations causing personal injury and property damage, the infringed can file tort lawsuits. There

are other judicial relief channels for personal injury and property damage. Therefore, the category of social public interest only includes ecological and environmental interests, without considering personal and property damage (Cao, 2022, pp. 687-693).

4.4 Causal Relationship of Major Risks

For the causal relationship of major risks, it is necessary to examine from two dimensions. The first is the proof content of the causal relationship. In the proof content of the causal relationship, the judge not only needs to determine that there is a causal relationship between the daily production and life behavior of the actor or the general environmental development and utilization behavior and the major risk of the ecological environment, but also needs to determine that there is a causal relationship between the major risk of the ecological environment caused by the actor and the degree of serious or irrecoverable damage, that is, there is a causal relationship between the actor's behavior and the possibility of damage occurrence and the severity of the damage.

The second is the proof rule of the causal relationship. Based on the presumption rule of the causal relationship, once certain ostensible facts are damaged and it can be presumed that there is a causal relationship between the damage and the fact, the victim does not need to prove the causal relationship again to safeguard his own interests. At the same time, the actor can only be exempted from his liability by disproving that his damage fact has nothing to do with the resulting damage (Qiu, 2002, p. 225). In the presumption rule of the causal relationship, the plaintiff provides preliminary evidence that the defendant's behavior endangers the social public interest, and then the defendant bears the burden of proof of the causal relationship in substantive sense. Although the burden of proof of the causal relationship in substantive sense is borne by the defendant in the litigation, the plaintiff still needs to provide a low-level proof of the litigation claim. This not only ensures that the burden of proof has a certain degree of difficulty, but also reduces the burden of proof of the plaintiff while also alleviating the burden of proof of the defendant (Yu & Mu, 2019, pp. 25-32).

5. Judicial Determination Approaches of Major Risks

After understanding the characteristics of major risks, narrowing the scope of major risks, and clarifying the constituent conditions of major risks, we still need to focus on the determination of major risks by judges, which can be carried out from the dimensions of factual cognition and value judgment.

5.1 Dimension of Factual Cognition

When judges determine whether the production and life behaviors or environmental benefit behaviors of the actor constitute a major risk to the public interest, on the one hand, they should utilize scientific methods of factual cognition, and on the other hand, they should follow objective bases for factual determination.

5.1.1 Methods of Factual Cognition

The approaches for judges to cognize facts include the standard of the general public, the scientific opinions of environmental professionals, and the judge's own rules of experience. The so-called

standard of the general public refers to judging whether the actor's behavior constitutes a major risk behavior based on the cognitive ability of the majority of the society. This cognitive method has its merits and can identify the possible major risks of the actor earlier when the administrative organ fails to manage the actor's development behavior. However, the standard of the general public represents the empirical rationality of the general public and may sometimes have ambiguity with scientific rationality. That is, the behavior identified as a major risk according to the standard of the general public may not reach the level of major risk based on scientific appraisal opinions; and the behavior not considered a major risk according to the standard of the general public may reach the level of major risk based on scientific appraisal opinions.

The scientific opinions of environmental professionals, including the scientific appraisal opinions such as the permits of environmental administrative departments and the appraisal opinions of environmental experts, represent the scientific rationality of environmental professionals. Through professional experiments and scientific analysis and evaluation, a scientific environmental opinion can be provided. However, this method is not only prone to conflicts with the standard of the general public, but also prone to internal conflicts within scientific opinions. On the one hand, there are conflicts between the scientific opinions issued by environmental administrative departments such as environmental permits and environmental impact assessment reports and the scientific appraisal opinions and expert testimonies issued by environmental experts. On the other hand, there are conflicts among different environmental expert opinions issued by different environmental experts.

The judge's own rule of experience means that the judge exercises discretion based on the trial of case evidence and his own empirical rationality. However, the judge himself is not an environmental professional and it is difficult to conduct a complete review of environmental professional evidence. What needs to be clear at this time is that in the determination of major risks, judges cannot rely solely on science, but at the same time cannot ignore scientific evidence. That is, in this process, a judgment to take preventive measures can be made without definite evidence proving that the risky behavior will cause serious ecological damage or environmental damage consequences; at the same time, the judgment to take preventive measures relies on the confirmation by scientific evidence that the risky behavior has a high possibility of causing serious ecological and environmental damage. Therefore, the judge's method of factual cognition should be mainly based on his own empirical rationality, supplemented by the standard of the general public and environmental scientific opinions, in order to determine whether the risky behavior is a major risky behavior.

5.1.2 Bases of Factual Cognition

When judges make factual determinations, they need to rely on objective bases, which include environmental quality standards, ecological protection red lines, the list of nationally protected wild animals and plants, etc. Environmental quality standards refer to the regulations on the allowable content of various harmful substances or factors in the environment within a certain time and space for the purpose of maintaining certain environmental quality, protecting the health of the population, social

wealth, and promoting a virtuous ecological cycle (Wang, 2018, p. 123). When making factual determinations, judges can refer to the pollutant concentration in the area caused by the actor's risky behavior. If the pollutant concentration in the area is about to reach the limit of the environmental quality standard or has reached 80% of the requirements of the environmental quality standard, at this time, this behavior is about to cause serious actual damage to the ecological environment and should be identified as a major risky behavior.

The ecological protection red line refers to the area with particularly important ecological functions within the ecological space that must be mandatorily and strictly protected, and is the bottom line and lifeline for ensuring and maintaining national ecological security (Tang Shuang'e., 2024, pp. 173-191). The scope of the ecological protection red line includes important ecological functional areas and ecologically sensitive and fragile areas. For areas clearly defined as ecological protection red lines, if the actor's behavior has the possibility of damaging the ecological environment of the area, it can be identified as a major risky behavior without reaching the degree of severity or irreparability.

The "List of Nationally Protected Wild Animals" and the "List of Nationally Protected Wild Plants" were issued in 1989 and 1999 respectively and have undergone multiple adjustments. These two documents can be used as the basis for courts when identifying rare creatures. Wild animals and plants under national key protection can be identified as the major risk level when the actor's behavior threatens the survival of rare creatures according to the protection level. Therefore, if the actor's behavior poses a threat to the survival of nationally protected wild animals and wild plants in the area, the actor's behavior is identified as a major risk.

5.2 Dimension of Value Judgment

Regarding risks, there are no experts. The internal and external uncertainty issues involved in environmental risks cannot be overcome by existing scientific knowledge, nor can scientists (Han & Leng, 2023, pp. 202-212). For the uncertain legal concept of major risks, when judges cannot determine major risks through the narrowing of the characteristics of major risks by legal principles and the use of constituent elements of the determination of major risks, they can introduce value judgment, that is, by differentiating and weighing different values and interests, and judging whether major risks are constituted based on the value hierarchy. This kind of value judgment includes not only the values inherent in norms, but also the common social and ethical values (Li & Jin, 2020, pp. 99-108, p. 112). In this process, judges need to weigh social public interests and economic development interests, and also consider the practical value of judicial decisions, adhere to the law as the basis, convince people with reason, and touch people with emotion, to achieve the best legal, political and social effects.

When judges make value judgments on risky behaviors, they should consciously exclude existing legal norms to consider dispute resolution solutions (Li, & Sun, 2012, pp. 58-66), that is, by making judgments on simple social and ethical values. The consideration of various values is not only a comparison of the relative importance of interests, but also, to a certain extent, an insistence on

environmental ethics (Kang, 2023, pp. 76-84). In specific cases, judges should fully consider the various interests involved in the case, be cautious enough in considering environmental interests, and give priority to environmental public interests when environmental interests conflict with economic interests.

6. Conclusion

Preventive environmental public interest litigation is a concrete manifestation of the prevention-oriented concept of China's Environmental Protection Law. Limited by the unclear coverage of major risks at present, judicial organs tend to be passive and conservative in the application of preventive environmental public interest litigation. By analyzing the origin and concept of major risks themselves, it can be found that major risks have a high probability of causing damage and the severity and irrecoverability of the damage results. The characteristics of major risks can be further narrowed by means of the principle of proportionality and the weak precautionary principle, and targeted response measures for risks of various grades and degrees of damage can be proposed. Further analyzing the constituent elements of major risks, it can be found that the identifying subject of major risks is the court, the dangerous behavior is daily production and life behaviors or general environmental development and utilization behaviors, the behavioral outcome should point to the harm to social public interests, and at the same time, double proof content determination is required in the causal relationship. In the process of confirming major risks, judges should use the fact determination method mainly based on their own rules of experience and supplemented by the standard of the general public and the standard of scientific rationality, and make fact determinations with the help of objective fact determination bases such as environmental quality standards, ecological protection red lines, and the list of nationally protected wild animals and plants. When major risks are still uncertain, the method of value judgment can be used for demonstration. It is expected that clarifying the coverage of major risks can provide a reference for the judicial practice of preventive environmental public interest litigation.

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