Legal Mechanism for International Damage Caused by Transboundary Transference of Modified Living Organism

LIU Shiyi
Sichuan University, Chengdu, China

Modified living organism is a double-edged sword, which brings human benefits as well as risks to ecological environment. The transboundary transference of modified living organism may cause damage to the ecological environment, and there are still many problems with the existing legal mechanism. Therefore, the author proposed some suggestions based on the characteristics of international damage caused by transboundary transference of modified living organism, such as unifying the standard of damage degree quantification and the specific way of liability; carrying out the responsibility of damage; determining the principle of imputation; and the time limit liability investigation.

Keywords: modified living organism, transboundary transference, international damage, biosafety protocol, early warning principles, prior informed consent procedure

Concepts, Benefits, and Risks of Modified Living Organism

Transgenic Organism and Modified Living Organism

A new legal concept—modified living organism is proposed in the Cartagena Protocol on Biosafety (2000, hereinafter referred to as the Protocol). Its Article 3 gives a specific definition: “any living organism acquired by modern genetic techniques with a combination of new allogenes”.

Modified living organism emphasizes “living” organisms that have the ability to transmit to nature, and transgenic organism, as a general concept, has a wider range than modified living organisms. Genetically modified corn, for example, can be called a modified living organism, but it can no longer be called a modified living organism after being ground into corn flour, that is because corn flour has no activity to escape into nature. The various issues discussed later in this work regarding transboundary transference are based on the definition of modified living organism rather than general transgenic products (Qian, 2006).

Game Between Benefits and Risks

The debate over transgenic technology has never stopped. For one thing, transgenic technology brings many benefits to people. It can make crops mature faster, make crops have better biological properties, and reduce the amount of pesticide and fertilizer (Pray, Huang, Hu, & Rozelle, 2002).

For another, transgenic technology may cause great harm to the ecological environment. Modified living organism spreads to non-specific environments through insect and wind media, so that their genes spread in the...
natural environment, and this phenomenon is called “gene drift” or “gene escape”. When artificially modified gene fragments appear in other organisms through “gene drift”, they may lead to the birth of super species. Super species have highly competitive traits, and their ability to seize natural resources is greatly enhanced, which can pose a great threat to other species that originally exist in the ecosystem, and even some of the less competitive species will be extinct. The ecological environment invaded by super species will gradually become simpler in structure, leading to a devastating blow to biodiversity, a decrease in ecosystem stability, and finally a complete destruction of the entire ecosystem, such as the genetically modified canola super weed case in Canada (Mou, Jia, Zhao, Guo, & Chen, 2016; The Central Literature Research Office, 2014).

Research Results of International Environmental Law

Currently, there are two international treaties on modified living organism: One is the World Trade Organization Agreement on the Implementation of Sanitary and Phytosanitary Measures (SPS Agreement), and the other is the Protocol led by the United Nations.

SPS Agreement is based on the perspective of international trade. In order to protect their product markets, some countries use animal and plant quarantine as an excuse to prevent the entry of related products from other countries into their markets. This kind of non-tariff barrier is highly concealed and easy to circumvent international trade rules, so the international trade organization has made SPS Agreement to let WTO Agreement Principle permeate into it.

Therefore, the provisions of the SPS Agreement on transboundary transference of modified living organisms are relatively loose, and Article 5 of the Agreement stipulates the “risk assessment and determination of appropriate level of sanitary and phytosanitary protection”, which specifies that strict preventive measures should not be applied in cases of scientific uncertainty and risk, thereby minimizing their negative effects on trade.

The Protocol is based on a biodiversity conservation perspective. The objective is to protect biodiversity from the potential threat posed by living modified organisms. The Protocol establishes the principle of early warning and establishes a prior informed consent procedure to give countries the right to request from exporters the necessary information on modified living organisms and to decide independently whether to import the living modified organisms on the basis of information and national circumstances (Yu & Gao, 2014; Yuan, 2011). The agreement advocates that preventive measures be allowed when science cannot determine that new technologies are not at risk.

The Protocol is currently the most important and comprehensive legal document on transboundary transference of modified living organisms. In October 2010, the Fifth Conference of the Parties to the Protocol adopted the Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety (hereinafter referred to as the Supplementary Protocol). The Supplementary Protocol provides for liability and remedies not covered by the Protocol.

Problems and Thoughts on the Legal Mechanism

Problems and Deficiencies of the Existing Mechanism

Determination of the extent of the damage. The damage caused by modified living organism to the ecological environment is not like the damage caused to people or property, and it is not easy to identify and
quantify (Wang, 2002). Whether the determination is based on quantification of biodiversity or other indicators, or only on the cost of recovery measures, should be clarified. The Supplementary Protocol provides criteria for determining whether a reduction in the “capacity to provide goods and services for biodiversity components” can be considered as “significant” damage. This criterion is vague since the results are very different based on different theories. For example, the “rivet hypothesis” holds that the ecological community is associated and that changes in any one species will affect the entire biosphere; the “redundancy hypothesis”, on the contrary, argues that the ecological community structure is loose and that one species loses another species to replace its position in the biosphere (Chu Yun Yuming, 2002). As a result, countries will be based on different positions, the identification of excessive deviations.

The subject of liability for damage. Article 2 of the Supplementary Protocol provides that the liability for damage to modified living organism lies with private actors (operators), that is, anyone who controls modified living organism directly or indirectly. In addition, it provides that the subject of the claim includes the State and the victim, since the victim does not have the capacity to make a claim for damages or when the ecological environment is adversely affected, the competent authorities of importing countries, when exercising their functions, make emergency measures promptly, and of course they have the right to claim compensation from the operators afterwards. The damage caused by modified living organisms is often huge, so it is difficult for private subjects to fulfill their liability, and liability may be remain in name only. Countries of origin should act as “parents” to address the international damage caused by private entities, rather than laissez-faire.

Doctrine of liability fixation. Strict liability can sometimes appear too severe to discourage international trade; but if negligent liability is adopted, ecological damage is latent, and it will be difficult to trace back the fault of exporters many years ago. The Supplementary Protocol sidesteps the principle of establishing accountability, which needs to be improved and perfected.

The way of taking responsibility. The Supplementary Protocol establishes two modes of liability: One is the response measures stipulated in Article 5, and the other is the civil liability stipulated in Article 12. Requirements for the implementation of response measures: When damage to biodiversity has occurred or is highly likely to occur if the response is not taken in a timely manner. However, it leaves the specific form of response to domestic law. In the case of civil liability, it leaves all the elements to the parties to apply existing or new domestic laws. It is not appropriate for such discretionary powers to be handed over to the domestic law of States. Without a unified international value assessment standard, it is difficult for all countries to reach an agreement on responsibility through domestic laws.

Reflections and Recommendations

Establishing uniform standards. The criteria of the Supplementary Protocol for determining the extent of damage is vague, and the specific forms of response and civil liability are also referred to domestic law. When international damage occurs, each country will choose the theory that is beneficial to itself to assess the value of the ecological environment, so the evaluation results cannot be unified, and it is difficult to reflect fairness. Therefore, the author thinks that the standard of judging the degree of damage and the way of taking responsibility should be set up as soon as possible, which is the most important and urgent problem at present.
Assuming responsibility for the damage. The damage caused by transboundary transference of modified living organism is often enormous, and remediation requires high funding. None of the current legal documents refers to how the subject of the liability assumes such liability. The author thinks that compulsory liability insurance and convention fund can be used for reference in civil liability for oil pollution damage.

The Oil Pollution Damage Treaty requires ship operators to insure oil shipments based on their registered tonnage and the size of the ship. In addition, if the shipowner is exempt from liability and does not have the means to make full compensation or the cost of remedy exceeds his obligation, the aggrieved party may obtain additional compensation through the Convention Fund. Both the compulsory insurance system and the compensation fund are worth learning, and the compulsory insurance mechanism can be adopted according to the export volume. In addition, contracting parties may establish a compensation fund to supplement losses not covered by insurance. An expert group could also be formed to assess the extent of the damage, modelled on the Oil Pollution Damage Regulations Fund, since decisions with internal coherence and consistency would help to refine the definition of biodiversity loss and reduce the arbitrariness of the amount of compensation.

Remediation of the ecological environment, which is shelved due to lack of funds, can lead to more serious damage that can be avoided if timely remediation be undertaken. In addition, given the value of the ecosystem’s own services, the longer the repair takes, the higher the cost of lost functionality will be. Therefore, in order to ensure that there are enough funds to stop losses in time and repair the ecological environment, a compulsory insurance mechanism can be introduced based on the volume of exports, or a compensation fund can be established to supplement the parties’ non-insured losses.

Determining the principle of imputation. The Supplementary Protocol evades the principle of attribution, and the classic Basel Protocol (hereinafter referred to as the Ba) addresses the responsibility of exporters of hazardous substances in the form of strict liability and negligent liability. The Ba stipulates that this provision, which is at the risk of the importer once the transport has reached its destination, is not necessarily suitable for transboundary transference of modified living organism. The author thinks that the strict liability of mitigation is more suitable for the problem of damage caused by modified living objects. It is worth learning from the fact that the Ba harmonizes the interests of exporters and importers by establishing a limit on damages in the event of strict liability, and that the upper limit on damages can protect the exporting party of living modified objects from withdrawing from the field due to excessive liability.

Time limit for investigation of special liability. Damage caused by transboundary transference of modified living organism involves genetic contamination, which is a significant and lengthy process. Nuclear damage has similar characteristics, so it can refer to the liability pursuit system of nuclear damage (Lou, Yang, Long, & Zhang, 2002). The international civil liability mechanism for nuclear damage consists of four main documents: the Convention on Third Party Liability in the Field of Nuclear Energy, the Brussels Supplementary Convention on Third Party Liability in the Field of Nuclear Energy, the Vienna Convention on Civil Liability for Nuclear Damage, and the Amendment to the Vienna Convention on Civil Liability for Nuclear Damage, 1963. Its provisions for accountability can be drawn from when the injured party should recognize the harm as a starting point rather than when the transboundary begins. It requires that exporters be held responsible for human health and environmental effects for a considerable period after the transport of modified living organisms, which is a breakthrough in international law. It can also be used to reverse the
burden of proof so that the injured party does not need to determine which type of modification or organism causes the damage and the exporting party demonstrated that it is not liable for the particular damage.

**Conclusion**

When the modified living organism transits across the border, it may cause damage to the ecological environment. The existing legal mechanism in China still has some shortcomings, which can be improved from: (1) unifying the standard of damage degree quantification and the specific way of liability, (2) assuming responsibility for the damage, (3) determining the rule principle, and (4) clarifying the special liability period. To summarize, a perfect legal mechanism is not only to protect a country, but also to protect the ecology of the whole planet.

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