Who Pays for Weather Modification Damage?

by EDITH BROWN WEISS*

More than 60 countries have at some time tried to make the weather better than it is. Despite progress in the last thirty years, weather modification is still a relatively new, underdeveloped and normally unreliable technology. Who pays for the damage when weather modification makes the weather worse rather than better for some people? Let us consider a hypothetical scenario in which the question could arise:

A country seeds clouds over its own territory, which apparently increases the rainfall in a neighboring country. While farmers in the neighboring country often want new rain, the timing of this program is wrong, and the farmers report serious damage to their crop. What is the responsibility of the country engaged in cloud seeding for the weather modification damage in the neighboring state? Would the state’s liability be different if a commercial company seeded the clouds for a private client in the state?

Damages from weather modification can involve physical loss of property, personal injury, economic losses, or even ecological damage. Damages will arise generally from three situations: weather modification produces a different result from that intended (e.g., it decreased rainfall, or increased rainfall too much); weather modification produced the intended result, but some persons still suffered from this damage because they needed less not more rainfall, or they needed the water from the typhoon, regardless of wind damage; or weather modification produced the intended result, but the weather conditions, while better than they would otherwise have been, were still worse than before the seeding began (e.g., winds of hurricane decreased from seeding, but speed still increased from what it was before seeding began). In any of these situations, countries could try to make the states engaged in weather modification pay for the damage. The question is whether they would succeed, and what problems they would encounter in establishing their case.

Bases of Liability

The basic rule in international law is that a State must violate an international obligation, before it is responsible for damages. But recent developments suggest that in certain circumstances a State may be liable even though it has not committed an illegal action under international law. Several conventions have imposed liability in the absence of fault, and this trend is likely to continue. In practice, this means holding States strictly responsible for the effects of certain activities, even though the actions were committed neither willfully, maliciously, or negligently.

There are at least two bases in international law for holding a State liable for weather modification damage: (1) that the State has abused its rights as a State (the Abuse of Rights Doctrine) or (2) that it has violated the general principle of good neighborliness between States.

Enforcement

The Abuse of Rights doctrine is one of the traditional doctrines of international law. According to Oppenheim, a State is liable for damages when it exploits a right it possesses under international law "in such a way as to inflict upon another State an injury which cannot be justified by a legitimate consider-

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tion of its own advantage". Traditionally, the doctrine has been applied to a State's activities within its jurisdiction which abuse the rights of other States or foreign nationals. Several writers have suggested that the doctrine applies to certain environmental cases, which are relevant for weather modification liability: nuclear tests by the United States, the United Kingdom and more recently, the French in the Pacific; and State pollution of the environment of adjacent States. In cases of environmental damage to neighboring States, the doctrine holds that a State abuses its rights when it sends polluting fumes into another State, causing "serious injury". Cloud-seeding which seriously affects precipitation in an adjacent State is sufficiently analogous that the abuse of rights doctrine might be applied.

More likely, international claims of liability for weather modification damage will allege violation of the international legal principle of good neighborliness, which is closely related to the abuse of rights doctrine. The principle imposes upon States the duty to protect other States from injuries caused by acts within the State or by persons under its jurisdiction. International law is moving towards applying the principle more widely to environmental problems. For example, principle 21 of the 1972 Stockholm Declaration on the Human Environment declares that "States have, in accordance with the Charter of the United Nations and the principles of international law... the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction".

The 1941 Trail Smelter Arbitration between the United States and Canada is the most frequently cited source for the principle of neighborliness. In this case, an Arbitral Tribunal held Canada liable for damages in the state of Washington, USA, from fumes emitting from a Canadian smelting company in British Columbia. The final decision of the Tribunal declared that the decision makes a State liable for injury to other States.

Must You Be At Fault?

The traditional rule in international law is that States are only liable for fault, either intentional harm or negligence. However, this position is changing, and a major controversy is the extent to which States can be held liable when they are not at fault, i.e., strictly liable. Strict liability is usually discussed in terms of liability for ultrahazardous activities. C. W. Jenks, a noted international jurist, defines ultrahazardous liability as implying that the consequences in the exceptional and perhaps quite improbable event of the hazard materializing may be so far-reaching that special rules concerning the liability for such consequences are necessary if serious injustice and hardship are to be avoided.

A number of recent international conventions have adopted strict liability for ultrahazardous activities: conventions governing nuclear accidents (such as the Brussels Convention on the Liability of Operators of Nuclear Ships), outer space and aviation hazards, and ocean pollution. The question is whether weather modification is an activity so inherently dangerous that a party engaging in it should bear all the risks. One can persuasively argue that it is.

Proving Weather Modification Caused the Damage

To make someone liable for damage from weather modification, the injured party must prove that weather modifi-
cocation in fact caused the damage. Given the present state of the technology, it is almost impossible to prove. In the slightly more than a dozen litigations in the United States involving alleged weather modification damage, cause was not satisfactorily shown. The exception is a Texas case in which the judge relied upon observations of local residents rather than only upon expert witnesses to find that the cloud-seeding operations were causing damage. In some countries, a court’s evidentiary rules may require only a showing that the weather modification operation could have caused the damage and put the burden of proof on the weather modifier to prove that it did not. At present, it is difficult to establish even that the operation could have caused the damage, but once that is done, it will be almost impossible, given the present state of the art, to disprove the causal connection. The outcome of weather modification cases in different countries may well be determined by the court’s choice of evidentiary rules.

As the technology develops and we have a sufficient number of operations to derive satisfactory statistical probabilities for the likelihood of damage under given conditions, it will become easier to prove causation. In the United States, courts are beginning to be receptive and understanding of the science will also facilitate the ability of claimants to prove that weather modification caused the damage. But for now, proving causation is a major hurdle to recovery.

Compensating for the Damage

Even if we assume that cause can be shown, it will normally be difficult to determine the amount of compensation that should be awarded for weather modification damage. In international law, the essence of compensation is reparation, which means that compensation “must, as far as possible, wipe out all the consequences of the illegal act and reestablish the situation which would, in all probability, have existed if that act had not been committed.” The most commonly used measure of damage is direct physical loss to persons and property. Compensation for economic losses may or may not be allowed. Yet economic losses are often the critical loss in cases of weather modification. If the farmer wants rain, but a resort owner does not, the loss will be an economic one. Weather modification damage may also involve ecological or environmental losses. Some legal systems allow compensation for such damage; others do not. Environmental harm is indirect and more long-term that other kinds of losses. A very difficult problem in awarding damages will be determining whether the damage is too remote from the weather modification operation to be compensated. For example, in the Trail Smelter Arbitration, damage to the Columbia River between Washington and Oregon allegedly caused by the disposal of slag from Canadian smelters was not compensable. The Tribunal found insufficient evidence that the smelters had caused the damage to the Columbia, but Canada argued that the damage would not be compensable in any event, because it was too remote. Different legal systems have different rules governing the remoteness of the damage acceptable for compensation.

Compensation for specific damages will be denied if there is insufficient proof that the action caused the particular damage. This issue is closely linked with that of remoteness. The more remote the damage, the more difficult it will normally be to prove that the offending weather modification operation was the proximate cause of the damage. The larger in scale the weather modification operation is, the more unlikely it is that litigation will result in compensation of all the damages which the operation may have triggered.

Liability of Countries for Commercial Weather Modification Operations

Suppose that a commercial weather modification company seeds clouds in its own country for a private client which affects the rainfall in a neighboring country and causes damage there. To what extent can a country be held liable for damage to a neighboring country, which is caused by the operations of its commercial weather modifiers?

The primary basis for claiming that a State would be liable for these damages is the international legal principle of neighborliness, as reflected in the Trail Smelter Arbitration, and Principles 21 and 22 of the Stockholm Declaration on the Human Environment. The Final Decision in the Trail Smelter Arbitration declared that “[n]o State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence”. This would cover State responsibility for private weather modification operations conducted within its own territory. It sets forth the criteria that the case must be of serious consequence and the injury established by clear and convincing evidence, before the State could be held responsible. Principle 21 of the Stockholm Declaration affirms the obligation of States not to damage the environment of other States. But Principle 22 acknowledges the rudimentary state of liability law in compensating people for pollution or other environmental damage caused by activities in neighboring countries, and calls upon States to develop this aspect of the law more fully.

Whether these developments have already firmly established the liability of States for activities of their private weather modifiers within their own territory is subject to dispute. The Canadian Legal Division of the Department of External Affairs advised in a 1969 memorandum that:

Under international law every State has a duty to prevent, as far as possible, its own nationals and foreign nationals within its territory from committing injurious acts against other States. A State which does not comply with this duty, either intentionally or maliciously or through culpable negligence is guilty of an international offense for which it has to bear original responsibility. However, it is of course in practice impossible for a State to prevent all injurious acts which a private person might commit against a foreign State. It is for that reason that a State must, according to international law, bear vicarious responsibility for such injurious acts of private individuals as it is unable to prevent.

This makes a State liable for the activities of its private weather modifiers within its territory, if they cause damage to another State.

To summarize the liability of countries for weather modification damage, we return to the hypothetical case outlined at the outset: a country seeds clouds to increase rainfall in its own country but the additional rainfall allegedly caused in the neighboring country harms the farmers there. At the moment, it is unlikely that the country seeding the clouds would be liable for the damage to her neighbor, because it may be almost impossible to prove that the cloud

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Environmental Cooperation

Sweden–Hungary

Sweden and Hungary recently signed a treaty of cooperation on protecting the environment. The agreement provides for an exchange of experts and information in the field of the environment and a study of the possibilities for cooperation between research institutions in the two countries.

In the next two years, the Swedes will study the consequences in Hungary of ditching on a big scale and the use of liquid manures and pesticides in agriculture. The Hungarians are particularly interested in studying Sweden's air pollution and modern drainage techniques.

USSR–Sweden

Sweden and the Soviet Union recently extended their 1976 agreement on environmental cooperation for another two years. Working delegations of the two countries which recently met in Moscow and Tbilisi stated that they considered the first year of cooperation to have been positive and successful.

The two nations have agreed to continue the fight against pollution in the Baltic Sea. Other major questions to be dealt with are methods of restoring and protecting polluted lakes.

US–USSR Joint Environment Committee Meets

The sixth meeting of the US–USSR Joint Committee on Cooperation in the Field of Environmental Protection recently concluded a five-day meeting in Washington.

According to Pierre Shostal, the Executive Secretary for the US team, the meeting marked a transition from essentially consultative exchanges to “real joint work that produces economics of effort and resources”.

Agreement was reached regarding joint experiments on air-borne pollutants, the formation and transformation of natural aerosols, wildlife preservation, the effects of pollution on health, urban environmental problems and earthquake prediction.

Recently, a US delegation went to the Soviet Union to study the possibilities of joint work in the field of combating municipal source water pollution.

Agreement was reached on an exchange of water pollution specialists under which a Soviet team will visit Chicago's water treatment facilities and a group of US experts will in turn study a comparable scheme in the Soviet Union.

Convention Called For on Toxic Substances

Speaking before the NATO Committee on the Challenges of Modern Society in Brussels, Douglas M. Costle, US Environmental Protection Agency Administrator, called for an international convention to control the movement of toxic substances in world commerce. He said that such a convention would build upon existing efforts of individual countries and the important programs presently being sponsored by such international organizations as the Organization for Economic Coordination and Development and the World Health Organization. Projects should be envisioned that would reduce duplication in testing, research, and monitoring. In order to be effective, Costle said, the agreement should be in place within five years.