

Multilateral environmental agreements: trends in verification

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OVER THE PAST 50 YEARS there has been a dramatic increase in the number of multilateral environmental agreements (MEAs). Of the 216 listed by the United Nations Environment Programme, 209 were adopted after 1951, and approximately 75 percent of these were adopted after the 1972 UN Conference on the Human Environment in Stockholm, Sweden.¹

The purpose of this chapter is to trace the development of verification in such accords. The term is widely used in arms control literature to describe the processes of gathering, analysing and using information to make a judgement about compliance with an agreement. According to this model, the aim of verification is to raise confidence that a treaty is being implemented fairly and effectively. This is done by detecting non-compliance, deterring states that might be tempted not to comply, and providing compliant parties with the opportunity to demonstrate compliance.²

In general, MEAs do not contain explicit reference to verification,³ probably because it is seen as too difficult or provocative. Alternatively, the agreement in question may not be considered important enough to warrant the expense and trouble of setting up a verification system.⁴ However, MEAs do contain elements of verification. These are usually embedded in the wider framework of systems for implementation review—‘the rules and procedures by which parties to international agreements exchange data, share information on implementation, monitor activities, assess the adequacy of existing commitments and handle problems of poor implementation’.⁵

Information exchange is important because of the uncertainty surrounding many environmental agreements. Often when commitments are negotiated, it is unclear how effective they will be at solving the problem, or how parties will implement them. Initially, therefore, the primary purpose of monitoring is to gain under-

standing—it will be more closely linked to reviewing the adequacy of obligations than to assessing compliance with them.

Characteristics of verification in MEAs

The key characteristics of verification comprise information gathering, data authentication and assessment of compliance. Furthermore, MEAs may contain processes for dealing with non-compliance.

Information gathering

Three types of information gathering can be discerned with regard to environmental agreements: monitoring implementation of commitments; monitoring infractions; and monitoring the environmental problem itself.⁶ While the first two types are used for verification purposes, the latter is not generally used to assess compliance. One reason for this is that action taken to ameliorate the problem often does not have an immediate effect, and, as a result, it is not possible to measure directly the outcome of parties' efforts. For example, reductions in emissions of ozone depleting substances under the 1987 Montreal Protocol⁷ do not have an instant impact on ozone levels in the stratosphere. In addition, in most instances it is not possible to discern the contribution of individual parties' efforts. And it is often hard to gather data directly on the problem itself. For example, it is not easy to monitor endangered animals in the wild.

These monitoring difficulties mean that commitments negotiated under MEAs are not always directly linked to the problem. The 1973 Convention on International Trade in Endangered Species (CITES) promotes wildlife conservation through restrictions on trade of certain animals, plants and their products, rather than on activities in the field.⁸ Similarly, the Montreal Protocol monitors trade in ozone depleting substances as a proxy for emissions measurements.

Although data collected on the problem is not usually used to gauge compliance, it is vital to assessing the effectiveness of the agreement. Thus MEAs often provide for exchange of information on the status of the treaty's subject,⁹ usually through existing, informal scientific research networks.¹⁰

Data gathering on the implementation of national commitments relies heavily on self-reporting. Most MEAs require parties to report on such matters in order to assess compliance. Wolfgang Fischer has studied 13 MEAs that were adopted between 1948 and 1989 and cover a range of areas.¹¹ All required that parties provide

some kind of implementation report at an international level. A typical formulation is found in article 8, paragraph 7 of CITES: ‘each party shall prepare periodic reports on its implementation of the present Convention’.

The reliance on self-reporting may stem, in part, from the low priority given to these accords and unwillingness to establish multilateral, co-operative data gathering systems. Sensitivity to impingement on national sovereignty is also a factor. Developing nations may be particularly averse to ‘independent’ monitoring, which they perceive to be controlled by developed states with greater technical capabilities.¹²

The record of self-reporting is poor, with parties often submitting late or incomplete reports, and data in inconsistent formats. In 1992 the US General Accounting Office (GAO) reviewed reporting under eight MEAs.¹³ It concluded that, while informal information on implementation was available, reports submitted by the parties to the relevant treaty secretariats were the only source of formal data. Six of the agreements specified how implementation was to be measured, and required that parties provide relevant information periodically. Yet not all parties gave complete and timely information. Fewer than 50 percent of the parties to the 1972 London Convention,¹⁴ the 1973 MARPOL agreement¹⁵ and CITES provided the required reports. Rates were better for the 1946 International Convention for the Regulation of Whaling (ICRW),¹⁶ the 1988 NOX Protocol¹⁷ and the Montreal Protocol, although close to half of the reports submitted under the latter were incomplete.

The GAO study noted that reporting by developing countries was particularly poor, which, in many cases, reflected a lack of infrastructure and resources to collect and file the required information. But providing timely, comparable data is difficult even for developed states. Personnel and resources may be stretched if statistics have to be collected from disparate sources (including those outside government control) and converted into a new format.

However, non-reporting is sometimes deliberate. In the 1960s, for example, Panama failed to submit catch reports to the International Whaling Commission because its sole whaling ship, *Olympic Challenger*, was violating ICRW quotas.¹⁸ Intentional non-reporting has also been a problem in CITES.¹⁹

National reports can be supplemented, formally or informally, with independent information. In the case of the ICRW regime, the Bureau on International Whaling Statistics—established by the industry in the 1920s—provides data on commercial whaling activities.²⁰

Often information is provided by non-governmental organisations (NGOs). In some MEAs, formal arrangements have been established between MEAs and NGOs. For example, CITES parties' reports are supplemented by information compiled by the Wildlife Trade Monitoring Unit (WTMU), which is part of the World Council for Monitoring Conservation. It monitors trade in fauna and flora and is supported by an extensive network of NGOs working at the domestic level. The WTMU manages its database of trade records under contract to the CITES Secretariat and is obliged to report all instances of potentially illegal trade. Trade Records Analysis of Fauna and Flora in Commerce (TRAFFIC) International, a monitoring network run by the World Wide Fund for Nature and the International Union for the Conservation of Natural Resources, also informs the Secretariat of non-compliance.²¹

In other agreements NGOs provide valuable independent data on implementation outside formal treaty mechanisms.

- Greenpeace International has devoted significant attention to monitoring the whaling accords;
- Climate Action Network has published comprehensive assessments of parties' implementation of the 1992 United Nations Framework Convention on Climate Change (UNFCCC); and
- the Washington DC-based Natural Resources Defense Council (NRDC) has published state-by-state assessments of compliance with pledges made at the 1992 UN Conference on Environment and Development.

However, NGO monitoring is often less concerned with compliance in the narrow sense—adherence to the letter of an agreement—than with whether or not parties are acting in the spirit of the accord.²²

Data verification

Clearly self-reporting systems are open to abuse: parties may not wish to disclose data, either because they believe it to be commercially sensitive or valuable, or because of what it might reveal about their (lack of) implementation.²³ Usually they choose simply to withhold information, although there are known cases of parties submitting distorted data. Throughout the 1960s, for instance, the Soviet Union filed false reports under the ICRW.²⁴

The GAO study noted that secretariats often have neither the authority nor the information to verify reported data. In many MEAs, though, methods for verifying

information have evolved either formally or informally. Most of the time, these are carried out by secretariats, sometimes by NGOs, and, occasionally, by a formal body, like an implementation or infractions committee.

The first step in verifying data is to compare parties' submissions against information supplied in previous years, so as to spot any obvious inconsistencies. This is one of the first checks conducted by the UNFCCC Secretariat when it receives national greenhouse gas inventories.

Information filed from different parties can also be crosschecked. The WTMU database contains over 2.5 million wildlife trade records and allows import and export logs from the parties to be compared in order to identify anomalies. When the records do not match, WTMU informs the CITES Secretariat.

Data from the parties can also be compared with information submitted to other bodies, or with independent sources. The Montreal Protocol Secretariat, for example, has questioned Lebanese population data that significantly differed from UN figures.²⁵ In fishing agreements catch records can be cross-referenced with data from wholesalers or processors. Agreements on air or marine pollutants can be monitored by comparing national data with three-dimensional fusion models.²⁶

Finally, some form of on-site inspection can be used to verify directly or to augment parties' reports. A facilitative, non-confrontational approach is usually taken in MEAs, emphasising information gathering as opposed to verification. Under the 1971 Ramsar Convention,²⁷ for instance, if the Bureau suspects that a Ramsar site is changing adversely or is likely to do so, it can apply a Monitoring Procedure. This consists of teams of experts making long visits to the site, with the focus on scientific, technical and management issues, rather than on proving non-compliance. The stated purpose of the Procedure is not to 'detect compliance', but to 'assist implementation'.²⁸ By contrast, the International Observer System under the ICRW was explicitly set up in response to claims of inaccurate reporting by ships and the nations whose flag they fly.²⁹ Vessels were obliged to allow impartial observers to monitor the killing of whales.³⁰ But the system was not highly intrusive, as it was based on bilateral exchanges of observers, mostly among the whaling states themselves. CITES has also created a visiting mechanism, although this is not formally provided for in the Convention or even in its resolutions. The Secretariat has visited parties suspected of serious non-compliance and has conducted follow-up visits to check that the party is implementing agreed actions.³¹ In contrast to these 'soft' approaches to on-site inspections, the 1980 Convention on the Conser-

vation of Antarctic Marine Living Resources incorporates an 'anytime anywhere' inspection system, using observers nominated by states to monitor compliance. In addition, scientific observers may be present on fishing and research vessels throughout any voyage.³²

Assessment of compliance

Although most MEAs require parties to report on implementation of their commitments, few actually use these to assess compliance. Only in six of the 13 agreements studied by Wolfgang Fischer did the provisions explicitly indicate that the national implementation reports should be examined at an international level, and, even then, they did not mention 'compliance assessment' or 'verification'. Article 14 of the 1976 Barcelona Convention,³³ for example, stipulates that the Conference of the Parties must 'consider reports submitted by the contracting parties'. The other five agreements make general reference to the necessity of monitoring implementation of the MEA at the international level, but they do not refer explicitly to the reports. A typical formulation is Article 13 of the 1974 Convention on the Protection of the Marine Environment of the Baltic Sea Area: 'the duties of the Commission shall be . . . to keep the implementation of the present Convention under continuous observation'.³⁴

The ICRW and CITES are unusual among early MEAs in having systems for assessing compliance. These were both established after the MEA was adopted, possibly as a result of the high level of public awareness that the treaties have enjoyed. Interestingly, both Conventions rely heavily on independent data to assess compliance, rather than on parties' reports. Information on infractions of CITES is passed to the Secretariat by NGOs, via the WTMU and TRAFFIC, and by the parties themselves. All confirmed misdemeanours are published and tabled at each Conference of the Parties; a Standing Committee acts on them between conferences.³⁵ Similarly, under the ICRW, compliance assessment is based on infraction reports provided by international observers. These are reviewed by the Infraction Committee each year and made public.³⁶

The Montreal Protocol was the first MEA explicitly to include from the start a formal mechanism for identifying and handling problems of non-compliance.³⁷ Article 8 of the Protocol provides for adoption of a Non-Compliance Procedure (NCP), which occurred in 1990, three years after the treaty was agreed. The Secretariat to the Protocol prepares a report on implementation for each meeting of the parties,

showing their annual consumption and production of ozone depleting substances. Where compliance problems are evident, these can be referred to the Implementation Committee that manages the NCP.³⁸ Parties can also file reports about their own, or other states' problems with compliance—the Implementation Committee can investigate them. The Committee can request further information from the Secretariat and gather data in the party's territory if invited to do so.³⁹

The Montreal Protocol's NCP has paved the way for other MEAs to include formal assessment of compliance. For example, the parties to the 1979 Convention on Long-Range Transboundary Air Pollution⁴⁰ set up an Implementation Committee in December 1997 to review compliance with reporting requirements and other obligations in the protocols to the Convention.⁴¹ Again, the Committee is able to gather extra information from the Secretariat or in the state's territory at the invitation of the party.⁴² Negotiations on a compliance procedure for climate change obligations are now underway in accordance with Article 18 of the 1989 Kyoto Protocol to the UNFCCC.

Dealing with non-compliance

A facilitative approach is the norm for dealing with—when it is dealt with at all—non-compliance in MEAs. This stems from the view that non-compliance with MEAs is mostly the result of incapacity, rather than intentional disregard for the rules.⁴³ Facilitative responses to non-compliance usually involve the provision of financial and technical aid to the non-compliant party. But this may be linked to the threat of suspension of assistance should the affected party not co-operate in efforts to help it to comply. This approach was taken to deal with non-compliance with the Montreal Protocol by Eastern Bloc countries with 'economies in transition'. In 1994 the Protocol's reporting system revealed large-scale non-compliance with deadlines for phasing out ozone depleting substances. The Implementation Committee asked the affected parties to present detailed plans for ensuring compliance as soon as possible. Once the Committee had approved these plans they were recommended to the Global Environment Fund for financial support, conditional on the parties executing them.⁴⁴

A simple yet effective response to non-compliance in many MEAs is public revelation of the treaty violation. This permits other states, NGOs and the public to pressure governments and may deter states from violating agreements in the first place.⁴⁵ The value of such action is well illustrated by the environmental directives

of the European Community, which were often poorly implemented by member states until compliance information started to become public. Exposure to public scrutiny and criticism led many member states to improve their performance.⁴⁶

Where appropriate, suspension of trade arrangements can be a useful penalty for non-compliance. Between 1989 and 1992, for example, the CITES Secretariat repeatedly asked Italy to overcome serious implementation problems. In 1992 the Standing Committee concluded that Italy had not fully addressed these problems and urged the parties not to issue to, or accept from, Italy any more CITES documents. Although parties were under no legal obligation, most did so. Legal trade with Italy in endangered flora and fauna was effectively suspended until it complied. In the Montreal Protocol, too, suspension of treaty privileges can lead to a trade ban in regulated substances.

A few regimes contain provisions for levying fines or similar penalties against recalcitrant parties. The 1994 North American Agreement on Environmental Cooperation contains detailed provisions for imposing 'monetary enforcement assessments' against non-compliant parties. If a party is found to have persistently failed to enforce effectively its domestic environmental laws, it may be ordered to pay. However, these provisions have not been used to date.⁴⁷

Trends in verification

Given the variety of MEAs adopted over the past 50 years, it is hard to define clear patterns in verification. To overcome this difficulty John Lanchbery has identified a subset of MEAs with similar objectives and structures: those covering the conservation of flora and fauna.⁴⁸ Thirty-four such agreements have been in operation since the beginning of the twentieth century: 27 were adopted after 1950.

Within this group the historical trend is for agreements increasingly to contain verification elements. Lanchbery's data shows that, while prior to the 1950s most agreements did not have formal provisions for reporting or review, those adopted from the 1970s all did so. Subsequently, some agreements have also provided for independent expert reports and some kind of on-site inspection.

It seems likely that trends in flora and fauna agreements are indicative of an MEA paradigm shift towards better verification. This is evident from the attention given to compliance issues at the 1992 UN Conference on Environment and Development ('Earth Summit') in Rio de Janeiro, Brazil, and in the negotiation of recent landmark MEAs, such as the Montreal Protocol, the Climate Change

Convention and the 1992 Convention on Biological Diversity.⁴⁹ During discussions on the Kyoto Protocol, the US advocated a strong non-compliance procedure, including the possibility of sanctions. It claimed that this was indispensable in light of the economic mechanisms available to help parties meet their targets.⁵⁰

The increased interest in verification can be explained in a number of ways. One common explanation is that, as international environmental obligations have increasingly affected national economic interests, parties have become worried that non-compliant states may gain an unfair economic advantage over those that are in compliance. Another explanation is that the growing, competing needs of states for access to finite natural resources have made them more concerned with compliance. States have also been forced to take MEAs more seriously as they have assumed greater commitments under them.⁵¹

Another reason for the increased interest in verification may lie in the changing nature of environmental problems. When the effects of pollution were immediate and local or regional it was in the interest of all parties to comply with their obligations. But in the case of global problems, such as depletion of the ozone layer and climate change, there is no immediate incentive for any one country to comply. The 'free-rider' option has become more attractive. Consequently, parties have become more interested in making sure that all other parties to an MEA meet their commitments.

Rising public awareness of, and concern over, environmental issues has also forced governments to take their environmental obligations more seriously. Public awareness has been especially high with respect to two key meetings: the 1972 UN Conference on the Human Environment; and the UN Conference on Environment and Development. Both meetings spawned high-profile MEAs.⁵² Closely linked to this is the increasing role of environmental NGOs in the negotiation and verification of MEAs. Before the 1970s, NGOs were only occasionally acknowledged in multilateral environmental treaties and were rarely granted access to meetings of the parties. The major environmental treaties negotiated from the mid-1980s, however, contain expansive rules for NGO participation, with the result that NGOs have become active participants in many regime activities.⁵³ They have also assumed a strong informal influence on the verification of MEAs, both through raising public awareness, which has put pressure on governments, and through the establishment of their own monitoring and review activities. This has been made possible by the growth in size of NGOs and the expansion of their resources in recent decades.

Multilateral environmental agreements, 1948–1997

Adoption, entry into force and objectives

1940s

International Convention for the Regulation of Whaling (ICRW)

Adoption: 2 December 1946 **Entry into force:** 10 November 1948

To establish regulations for the conservation and utilisation of whale resources. Serves as an agency for the collection, analysis and publication of scientific information related to whales and whaling.

1970s

Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar Convention)

Adoption: 2 February 1971 **Entry into force:** 21 December 1975

The conservation and wise use of wetlands. International co-operation as a means to achieve sustainable development.

Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention)

Adoption: 13 November 1972 **Entry into force:** 30 August 1975

To prevent indiscriminate disposal at sea of waste liable to create hazards to human health, harm living resources and marine life, damage amenities, and/or interfere with legitimate uses of the sea.

Convention on International Trade in Endangered Species (CITES)

Adoption: 3 March 1973 **Entry into force:** 1 July 1975

To ensure that international trade in species of wild fauna and flora does not threaten survival in the wild of the species concerned. To protect certain endangered species from over-exploitation by means of import–export permits.

International Convention for the Prevention of Pollution from Ships (MARPOL)

Adoption: 2 November 1973 (modified on 17 February 1978) **Entry into force:** 2 October 1983

To eliminate pollution of the sea by oil, chemical and other harmful discharges from ships. To minimise the amount of oil released accidentally by collision or stranding of ships. To improve further the prevention and control of marine pollution from vessels, particularly oil tankers.

Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention)

Adoption: 22 March 1974 (amended 9 April 1992) **Entry into force:** 3 May 1980

To take all appropriate measures, individually or by means of regional co-operation, to prevent and abate pollution, and to protect and enhance the marine environment of the Baltic Sea area.

Convention for the Protection and Development of the Marine Environment and Coastal Region of the Mediterranean Sea (Barcelona Convention)

Adoption: 16 February 1976 **Entry into force:** 12 February 1978

To achieve international co-operation on a co-ordinated and comprehensive approach to the protection and enhancement of the marine environment and the coastal area of the Mediterranean.

Convention on Long-Range Transboundary Air Pollution (CLRTAP)

Adoption: 13 November 1979 **Entry into force:** 16 March 1983

To limit, reduce and prevent air pollution.

1980s

Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR)

Adoption: 20 May 1980 **Entry into force:** 7 April 1982

To conserve Antarctic marine living resources.

Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol)

Adoption: 16 September 1987 **Entry into force:** 1 January 1989

To protect the ozone layer by taking measures leading to total elimination of global emissions of ozone depleting substances.

Protocol to the Convention on Long-Range Transboundary Air Pollution Concerning the Control of Emissions of Nitrogen Oxides or Their Transboundary Flux (NOx Protocol)

Adoption: 31 October 1988 **Entry into force:** 14 February 1991

To control and reduce national emissions of nitrogen oxides.

1990s

Convention on Biological Diversity (CBD)

Adoption: 22 May 1992 **Entry into force:** 29 December 1993

To ensure conservation of biological diversity and sustainable use of its components. To promote fair and equitable sharing of the benefits of the use of genetic resources.

United Nations Framework Convention on Climate Change (UNFCCC)

Adoption: 9 May 1992 **Entry into force:** 21 March 1994

To stabilise greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous interference with the climate system.

North American Agreement on Environmental Co-operation (NAAEC)

Adoption: 1 January 1994 **Entry into force:** 1 January 1994

Side agreement to the North American Free Trade Agreement. Designed to encourage co-operation between parties to better conserve, protect and enhance the environment.

Kyoto Protocol to the United Nations Framework Convention on Climate Change (Kyoto Protocol)

Adoption: 11 December 1997 **Entry into force:** not yet in force

Contains individual emission limitations and reductions commitments for developed countries, covering the six main greenhouse gases.

Source

The Fridtjof Nansen Institute, *Yearbook of International Co-operation on Environment and Development 1999/2000*, Earthscan, London, 1999.

Greenpeace International, for example, was only established in 1971, but it now has 2.5 million supporters and offices in 40 countries.⁵⁴

A key factor in the development of MEA verification systems has been the learning experience of parties as the number of operational agreements has increased. Verification and compliance systems have evolved in many older agreements, even though they were not included in the original text. The development of methods to detect and deal with non-compliance in CITES and the ICRW are good examples. Experience with earlier agreements also demonstrated the difficulties that even parties acting in good faith have in implementing MEAs, and the need to make provision for technical and financial assistance. Negotiators of more recent agreements have been able to incorporate such mechanisms from the start. Parties to the Montreal Protocol are committed to the provision of technology transfer and financial aid—through a Multi-Lateral Fund (MLF)—to help developing countries meet their commitments to report baseline and annual data. Similar schemes operate under the auspices of the Global Environment Fund (GEF) for the UNFCCC and the Convention on Biological Diversity.

Aside from these general trends, specific events have improved verification in some instances. The end of the Cold War reduced the political barriers to data reporting in countries of the former Soviet Bloc, allowing a shift towards greater international openness and transparency, and, consequently, fuller and more honest reporting.⁵⁵ This has led to a significant improvement in the verification systems operating under the 1992 Helsinki Convention.⁵⁶ In other cases, technological advances have aided verification. For instance, it was very difficult to verify compliance with the original (1973) MARPOL agreement, forbidding ships from flushing out their oil chambers at sea. But when a new hull was developed that could not be flushed at sea, MARPOL insisted that all vessels had to be fitted with this type of hull or they could not be insured.⁵⁷

Rapid developments in information technology (IT) have vastly improved the ability of MEAs to process and disseminate data.⁵⁸ A good example is the WTMU's computerised database, which has revolutionised verification of CITES. Another example is the centralised database set up by the European members of MARPOL to allow near real-time information on ship inspections to be made available to all port authorities. The latter supply information from inspections—via telex and computer links—to the database on a daily basis. Since the database is accessible to all members, they can acquire advance information about the ships visiting

their ports, allowing them to deploy inspection resources more efficiently and effectively. Reporting has improved under this system, presumably because the database provides useful information to the port authorities.⁵⁹

In the most recent MEAs, verification systems are designed to use IT tools at all stages. Parties to the UNFCCC agreed in November 1999 to report their greenhouse gas inventories electronically in a 'common reporting format'. This will make it easier for the Secretariat to check for gaps and inconsistencies in the data. Both the results of this initial check and a subsequent expert review team report will be posted on the official UNFCCC website, making it possible for anyone to assess parties' implementation.

Outlook and lessons for the future

Developments in IT will continue to provide great opportunities for improving verification of MEAs in coming years. In particular, the Internet offers a powerful tool for formal and informal verification. While secretariats will be able to use it to improve transparency of reporting and review, networks of NGOs and other observers will find it easier to exchange and make public information on non-compliance.

Ultimately the Internet could allow near real-time monitoring of MEAs. It has been suggested, for example, that all major greenhouse gas emitters could be linked on-line to the extent that direct monitoring of emissions is relayed continuously to the Internet.⁶⁰ Although this might not happen for some time, it is likely that trading of emissions of greenhouse gases under the Kyoto Protocol will be monitored internationally, in real time, by connecting national databases via the Internet.⁶¹

Harmonisation of reporting under different MEAs has been identified as a future priority. The proliferation of reporting requirements under MEAs that have developed in recent years has left all countries, particularly developing states, struggling to meet their commitments. To make matters worse, information has to be in different formats for different MEAs, placing a heavy burden on states and means that secretariats cannot easily share data. Information harmonisation could lead to greater compliance with reporting requirements, more effective monitoring and review, more accessible information, and better, more consistent data.⁶² Some of the solutions may be quite simple, such as establishing common definitions of terms and synchronising reporting obligations with national information needs. These initiatives should start to reap benefits in coming years, greatly improving the efficiency and effectiveness of verification of MEAs.

Application of computing power can help, too. In Europe efforts have already been made to harmonise reporting of air emissions under the UNFCCC and the Convention on Long-Range Transboundary Air Pollution. The European Environment Agency has developed software that enables states to gather data using their preferred national system, and then to convert this into the appropriate form for each convention.⁶³

Another technology that could be used more in future is remote sensing satellites, although agreement on the use of information acquired by such means may be restricted because of concerns about infringement on national sovereignty. To date there have been no attempts to monitor routinely and systematically compliance with environmental agreements using remote sensing.⁶⁴ Yet satellites are now being launched specifically to monitor aspects of the global environment, such as land cover. They could help monitor a number of MEAs, including the UNFCCC and the 1994 Convention to Combat Desertification.⁶⁵

While technology has the potential to achieve significant improvements in the verification of MEAs, it must be available to all states. Technical and financial assistance must, therefore, be given to parties that might otherwise have difficulty installing and operating the technology.

With regard to the institutions for verification of MEAs, NGOs look set to continue to increase their involvement. It has been suggested that, for example, they be given a formal role in monitoring or assessing compliance with some MEAs, in the same way that labour unions and employers in the International Labour Organization are able to provide data on parties' implementation of international labour agreements.⁶⁶ Businesses could also become increasingly engaged—project mechanisms and emissions trading under the Kyoto Protocol will set the precedent. Under these schemes, private entities can participate in implementation. They will also be subject to strict verification, though, which is likely to include auditing and certification by third parties. In experimental projects, both professional audit companies and NGOs have been involved in the verification of emissions reductions.

Conclusion

Fifty years ago relatively few MEAs were in operation, and verification was virtually non-existent. In comparison, over 200 agreements are now in operation, and most contain at least some mechanisms for gathering and using data to make a judgement about compliance.

This progress can be explained by increased awareness of the need to act regionally and globally to protect the environment, fuelled by high-profile conferences and increasingly influential environmental NGOs. Where MEAs have had an impact on economic competitiveness, governments seem to have been more willing to establish verification systems. Technological advances and the accumulation of experience have made better verification possible.

Verification is dealt with differently in each MEA, depending on their often unique needs. Information is mostly supplied in the form of national reports from parties, which may be supplemented by independent data (often from NGOs) or some form of inspection. Older MEAs did not use this information to assess compliance, but, today, more agreements have formal compliance assessment procedures. Emphasis is often placed on assessing the overall progress of the MEA in tackling the environmental issue at hand, rather than on the efforts of individual parties. Where parties have persistently failed to meet their commitments, though, many MEAs do impose some kind of consequence.

In future verification of MEAs could be further strengthened as technological developments allow for more accurate and timely monitoring. Whether verification in MEAs ever gains the status it enjoys in other types of agreements will continue to depend on the importance attached to the MEAs themselves.

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