Nature Conservation and the Precautionary Principle

JOHN M. FRANCIS[1]

49 Gilmour Road
Edinburgh EH16 5NU

ABSTRACT: The application of the precautionary principle to an area of environmental protection, such as nature conservation, requires commitment to the idea that full scientific proof of a causal link between a potentially damaging operation and a long term environmental impact is not required. Adoption of the principle in Government statements related to sustainable development should therefore be seen in this context. The paper addresses the particular case of marine fish farming in Scotland where the principle was advocated but not upheld in practice. In the light of this experience there is a need for educators and philosophers, ethicists and concerned scientists to ensure that the principle is more widely interpreted and understood.

KEYWORDS: Nature conservation, sustainable development, international law, technology assessment.

In January 1994 the British Government published its strategy on sustainable development (Cm 2426). This incorporated a statement of the four main principles likely to determine the related programmes of action to be carried forward in the years ahead. These principles were summarised in the document as follows:

(1) Decisions should be based on the best possible scientific information and the analysis of risks.

(2) Where there is uncertainty and potentially serious risks exist, precautionary action may be necessary.

(3) Ecological impacts must be considered, particularly where resources are non-renewable or effects may be irreversible.

(4) Cost implications should be brought home directly to the people responsible – the 'polluter pays' principle.

The second of these statements is a reworking of the 'precautionary principle' which is becoming increasingly familiar to those having to face complex environmental decision-making without the benefit of an adequate baseline of

Environmental Values **5** (1996): 257-64

scientific information or detailed risk assessment. In some of these cases, environmental costs may have to be accepted as the consequence of economic development but in others, the natural resources – the landscape, wildlife or ecosystem – may need to be classified as so unique that they should be protected from exploitation. This latter position has a direct bearing on the concept of 'sustainable development' which is often defined as ' development that meets the needs of the present without compromising the ability of future generations to meet their own needs'.

In an earlier paper on the relationship between nature conservation and the 'voluntary principle' some of the problems presented by the practical application of such principles were outlined (Francis, 1994). Similarly, the introduction of the precautionary principle into this field raises many questions which should be more widely considered and analysed by reference to case studies in different parts of the world.

APPLICATION OF THE PRINCIPLE?

An example of the difficulty of applying the precautionary principle to the marine environment occurred in 1989. A UK Government agency, the Nature Conservancy Council (NCC), was then responsible for developing a conservation strategy to cope with the demands of a new marine industry farming principally salmon and a range of shellfish on the west coast of Scotland and in the northern Isles of Orkney and Shetland. It is fair to say that the development of the fish farming industry had emerged without the benefit of a planning framework, apart from the initial guidance produced by the Crown Estate Commissioners in 1987. The provisions of the Wildlife and Countryside Act 1981 enabled the Secretary of State for Scotland to designate Marine Nature Reserves (MNRs) but unfortunately the procedure is so difficult to administer in practice that there are still no areas designated as MNRs in Scotland. It is also worth noting that the provisions of the 1981 Act which allow the designation of land of special interest in scientific terms (SSSIs) do not extend to the marine environment beyond the mean level of spring tides. Given the proliferation of sites licensed by the Crown Estate Commission for fish farming operations in the late 1980s, it quickly became apparent that it would not be possible to devise an effective conservation strategy which was not linked in some way to an overall planning approach. Indeed local authorities in Scotland argued at the time that fish farming should be brought within the constraints of normal planning control. However, this line of approach was not acceptable to Government Ministers.

The operational difficulties for the NCC were compounded by the lack of systematic scientific data relating to the quality of the marine environment in Scotland over such an extensive coast line. (Indeed it is worth noting that the coast line of Argyll alone is greater in extent than the coast line of France.) At

around this time, NCC embarked on an ambitious 10-year programme to collect information from a variety of well-characterised sites on the west coast of Scotland and in the islands and to assemble the data in the form of a Marine Conservation Review. Unfortunately the pace of the survey work did not match the flow of inward investment associated with fish farming operations in this area. In the absence of an overall planning strategy there was a danger that even the most pristine sites of nature conservation value would become contaminated with the effluent and other discharges from fish farming installations. In some of the key areas, e.g. Loch Sunart, Lochaber District, local strategies were devised in an attempt to define the limits on carrying capacity for particular sea loch areas which had become the focus of such activity. The apparent mismatch between the availability of scientific data and the pace of economic development suggested that here was a clear case to test the validity of the precautionary principle in a practical way.

NCC therefore recommended that a national strategic statement should be drawn up as a reference document governing the development policy for inshore waters. This would attempt to define areas where there was:

(a) a presumption against development;

(b) a presumption against further development; or,

(c) a presumption in favour of development subject to regulations .

Sub-paragraph (a) is of course a direct translation of the precautionary principle.

A report was published by the NCC in January 1989 based on research and advice prepared by the Institute of Aquaculture, University of Stirling. The report included a recommendation to the effect that the proposed strategy should be subject to very wide consultation both with the marine fish farming industry and environmental groups, particularly those active in Scotland which included the Worldwide Fund for Nature and the Royal Society for the Protection of Birds. It was also recommended that the strategy should be incorporated into National Planning Guidelines in Scotland and possibly linked to the new Environmental Assessment System required by EC Directive.

The point at issue for NCC scientists charged with safeguarding the natural marine environment in the areas subject to development pressure from fish farming was that they could not afford to wait until the biological survey work had been completed and analysed. Instead they had to act in advance of that knowledge and assume that there would be sufficiently unique areas in the marine environment on this coastline which would need to be protected from exploitation for the foreseeable future. This accords with the general statement of the precautionary principle as it is more widely understood, namely, that we do not need to wait to accumulate scientific information which proves beyond reasonable doubt that the changes to the environment are irreversible and beyond the reach of conservation strategy.

DEFINITION OF THE PRECAUTIONARY PRINCIPLE

In the introductory chapter to their book O'Riordan and Cameron (1994) refer to the basic concepts which lie at the core of the precautionary principle. They describe the first of these concepts as follows:

> Preventative anticipation: a willingness to take action in advance of scientific proof of evidence of the need for the proposed action on the grounds that further delay will prove ultimately most costly to society and nature, and, in the longer term, selfish and unfair to future generations.

The idea that action should be taken in advance of obtaining conclusive scientific proof that a particular development may have adverse or even irreversible effects on the natural environment may prove distinctly uncomfortable to those scientists and engineers who are concerned to promote that development. This will occur despite the fact that most scientists and engineers acknowledge the limits to the assimilative capacity or resilience of natural systems when they are put under stress by external factors such as large pollution loads or any disturbance of the natural physical and chemical balance of materials in the environment. As scientific knowledge advances, there is clearly a potential to construct empirical models of these physical and chemical factors in order to generate interactive, even predictive, methods of working. However, it is recognised that the usefulness of such models depends to a very large extent on the availability of substantial volumes of time series data that is statistically reliable and verifiable by experiment. As O'Riordan and Cameron acknowledge, the adoption of the precautionary principle would tend to shift the duty of care or the onus of proof to those who propose change. In turn this would provide the link with the formal processes of environmental assessment which are now required for large scale developments which could potentially affect the natural environment. This approach is further explored in a later paper by O'Riordan and Jordan (1995).

In the example quoted earlier of marine fish farming in Scotland, the scientists concerned with conservation of the natural environment were placed in the invidious position of having to try and obtain the appropriate scientific evidence from the marine environment over a vast area, while at the same time the industry was proceeding apace with its own installation of fish farm cages and other facilities in nearly every significant sea loch on the west coast of Scotland. The developers took the view that the coastal waters, including estuaries and sea lochs, represented a substantial 'sink' for any potential pollutants and that the dilution capacity of this water volume was sufficient to eliminate any significant risk to the natural environment. This view of course takes no account of the variability of tidal patterns, scouring of sea lochs or the uncertain fate of pollution plumes associated with most fish farming installations. In these circumstances, the advocacy of a precautionary principle would seem to be readily justified.

THE INTERNATIONAL PRINCIPLE

Within the international community there is a growing recognition that in order to protect unique areas of the natural environment in the interests of sustainability and the intrinsic values of nature, governments need to invoke the precautionary principle. This approach is reflected in the Articles of the Treaty on European Union signed in Maastricht, and in force from November 1993, which require member states of the European Union to harmonise their economic and social policies, including those related to protection of the environment. The relevant Article reads as follows:

> Community policy on the environment shall aim at a high level of protection, taking into account the diversity of situations in the various regions of the Community. It shall be based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay. Environmental protection requirements must be integrated into the definition and implementation of other community policies.(Treaty on European Union, 1992)

As pointed out by O'Riordan and Cameron (1994), this statement of intent is substantially qualified by the need to balance the appropriate environmental costs and benefits alongside the actions taken, or not taken as the case may be, in any region of the Community subject to development pressures. In Britain this international endorsement of the precautionary principle has been proceeded by a reasonably consistent strand of argument which began to emerge in Government statements and documents in the late 1980s. When the first White Paper on the environment was published in 1990 under the title 'This Common Inheritance', the opening chapter contained a listing of first principles to be applied in the field of environmental protection. Amongst these the precautionary principle was introduced in the following terms:

> Where there are significant risks of damage to the environment, the Government will be prepared to take precautionary action to limit the use of potentially dangerous materials or the spread of potentially dangerous pollutants, even where scientific knowledge is not conclusive, if the balance of likely costs and benefits justifies it. This precautionary principle applies particularly where there are good grounds for judging either that action taken promptly at comparatively low cost may avoid more costly damage later, or that irreversible effects may follow if action is delayed.

The phrase 'even where scientific knowledge is not conclusive' therefore warrants intervention to prevent potential damage in those circumstances where the scientists concerned do not have or have not yet had the opportunity to accumulate specific information on a particular site or locality. This is crucial to our understanding of how the principle should be applied in practice. In the

example quoted earlier of marine fish farming in Scotland, the adoption of the precautionary principle was strongly advocated by the NCC scientists who were concerned about pollution of the water column and contamination of the seabed in the vicinity of industrial fish farming installations. There was particular concern in those areas where the concentration of these installations began to occur and there was an associated multiplication of the risk factors. However, despite the precautionary line adopted by the scientists, the drive of economic and social policies was allowed to take precedence over the interests of those seeking to protect the intrinsic nature conservation value of these areas. In the face of this development pressure, an attempt was made by the NCC to identify the coastal waters that were considered to be most at risk from the burgeoning industry by the introduction of so-called marine consultation areas. However, the onset of the economic recession in Britain in the early 1990s and the downward trend in the market price of farmed salmon resulted in a levelling off in the demand for site licences for new installations. The subsequent balance between environmental and development interests was therefore reached more as a result of external market forces than by a planning approach, and certainly not by upholding the precautionary principle in order to maintain the quality of the natural marine environment. It follows that more attention will need to focus not simply on advocacy but on practical application if this principle of precautionary action is to have lasting effect in conserving unique ecosystems in Britain and elsewhere.

It is encouraging to note that the propagation of the principle under international law is gaining momentum. For example the new Convention on the Protection and Use of Transboundary Watercourses and International Lakes (quoted by Cameron, 1994) incorporates the principle directly

> The precautionary principle, by virtue of which action to avoid the potential transboundary impact of the release of hazardous substances shall not be postponed on the ground that scientific research has not fully proved a causal link between those substances, on the one hand, and the potential transboundary impact, on the other hand.

This form of expression therefore provides grounds for hope that a collective will can emerge amongst nation states over the years ahead to uphold the principle and to ensure that potential environmental risks are not accepted or accommodated simply on the grounds of political and economic expediency.

SUSTAINABILITY AND THE BALANCE OF RISK

The exploitation of natural resources, whether land or minerals, freshwater or marine environments, has always carried a risk of possible irreversible ecological change. The increasing efficiency of exploitative technologies has reinforced

that risk and in several cases, is now pressing against the limits of ecological systems in such a way that irreversible change may be inevitable. The continuing use of chlorofluorocarbon (CFCs) compounds in aerosols or refrigerants may be a case in point, although the international protocol now in force is expected to ameliorate the cumulative effect of these chemicals. On the other hand, adoption of the precautionary principle and an agreed programme of international action to produce alternative chemical compounds without the same potentially damaging effects on the environment would have contributed a great deal more to the concept of sustainability and protection of the vitally important stratospheric ozone layer within our biosphere. Unfortunately we now have to rely on an essentially piecemeal approach at international level and crisis management measures may still have to be used to reduce the burden of CFCs and similar chemicals in current usage. The remedial costs of such action are often on a scale comparable to if not greater than the original economic benefits associated with the innovation. The framework of analysis at the outset usually favours the investment process and remedial costs are heavily discounted, in the event they may not be required to be met. This represents a classical fallacy in our reasoning about economic development as it affects our natural environment. If the costs of our actions are not to be conveyed forward to be borne by future generations, then it is essential that the precautionary principle should be addressed at the earliest possible stage of the investment cycle governing new technologies with a potential impact on the environment.

In industrialised countries, particularly those within the European Union and the Pacific rim, where natural resources are readily exploited because of available technologies, there is a need to ensure that the precautionary principle is more widely interpreted and understood at all levels of society. This is a task for educators and philosophers, ethicists and concerned scientists, because the values implicit in the propagation of the principle are central to the concept of sustainable development that has been endorsed in the inter-Governmental statements that have been issued both at the UN conference on environment and development in Rio de Janiero in 1992 and subsequently in the many programmes and initiatives that have been taken forward at both national and local levels. If prudence and good stewardship are seen as important environmental values, then they should be underpinned by the precautionary principle as a matter of collective self-interest. It is recognised that strong advocacy of this position will be constantly challenged on the grounds that it represents a negative bias against opportunities for innovative development and for economic expansion in general. This argument needs to be carefully addressed and rebutted.

A logical appraisal of any new technological or industrial system with a potentially large impact on the environment should be assessed in terms of its lasting effects on ecological systems including human populations. It follows that the costs of remedial action must be addressed realistically in the initial cost/benefit matrix and that a full acknowledgement of this uncertainty must be

expressed in economic terms as a major factor that cannot simply be deferred in order to await scientific proof. This new form of enlightenment will require discipline and a sense of purpose that has been noticeably lacking alongside the implicit faith in the market as the device for solving all of our problems.

NOTE

[1] Formerly, Chief Executive, Nature Conservancy Council for Scotland

REFERENCES

Cameron, James, 1994. 'The Status of the Precautionary Principle in International Law', in O'Riordan and Cameron (eds), *Interpreting the Precautionary Principle*, pp.262-89. London: Earthscan.

Fishfarming and the Safeguard of the Natural Marine Environment of Scotland. Nature Conservancy Council, Scottish Headquarters, Edinburgh, 1989, pp.113-15.

Francis, John M. 1994. 'Nature Conservation and the Voluntary Principle', *Environmental Values* **3**: 267-71.

O'Riordan, T. and Cameron, J. (eds), 1994, *Interpreting the Precautionary Principle*. London: Earthscan, pp.12-30.

O'Riordan, T. and Jordan, A. 1995. 'The Precautionary Principle in Contemporary Environmental Politics', *Environmental Values* **4**: 191-212.

Sustainable Development: The UK Strategy. Cm 2426, 1994. London: HMSO.

This Common Inheritance: Britain's Environmental Strategy. Cm 1200, 1990. London: HMSO.

Treaty of Rome, Title XVI. Article 130r (section 2), as amended by Title II of the Treaty on European Union signed in Maastricht on 7 February 1992.