

3

The social construction of environmental problems

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3.1 Introduction

As was discussed in Chapter 2, science plays a crucial role in identifying problems related to the functioning and deterioration of ecosystems. It also became clear that apparently purely physical problems need to be understood in social terms.

In this chapter we develop the idea that environmental problems are not pure and self-evident physical facts. Certain steps and conditions are needed before, for example, global warming can be conceived of as a risk to be dealt with. Global warming is not (or not yet) a visible phenomenon; one does not see incremental increases in temperature and for the time being there is no scientific consensus about the view that phenomena such as certain floods or drought observed in recent years are due to global warming. Nevertheless, it is regarded as a problem by many scientists, politicians and non-governmental organisations (NGOs). Why?

The factors of relevance include the widespread perception that certain ‘things’ are negative – because of their impact on human health, ecosystems, certain aesthetic or ethical values, and so on – and the conviction that something should and could be done to deal with them. In turn, perceptions are based on several societal factors such as the relative importance of certain problems in different socioeconomic contexts, and the public’s trust (or distrust) in the political and scientific institutions that are responsible for addressing the problems at hand. In other words, environmental problems are not given per se but are socially constructed and the way this construction process develops is influenced by the prevailing cultural, economic and political conditions in different social contexts.

In this chapter special attention is paid to the analysis of the processes through which certain physical events become (or do not become) environmental issues. The interaction between science and policy, including the ‘translation’ of scientific findings into economic and political terms, is addressed too. This is regarded as an

important component of the process of definition and selection of environmental issues.

This chapter provides a sociological perspective on the question of 'What are international environmental problems and why have they become important politically?'. It is composed of two 'theoretical' sections (illustrated with examples) and two 'empirical' ones, followed by some concluding remarks. The theoretical sections focus, first, on the interface between science and policy (section 3.2) and, second, on the social construction of environmental issues (section 3.3). The empirical sections that follow illustrate the theoretical arguments in the context of two specific examples of international environmental problems. The first example discusses how the depletion of the ozone layer came to be defined as a policy issue in the US, the EC, the former USSR and developing countries (3.4), while the second considers the different definitions of and responses to the Chernobyl fallout in Italy, Germany and France (3.5).

3.2 The interaction between science and policy

Questions such as how dangerous for human health and the environment a certain substance is and what alternatives are available, or what is the carrying capacity of ecosystems and what are the causes of human-made pressure on the global environment, involve the need for scientific investigation of biological, chemical, physical and social processes. These questions are thus viewed as matters to be solved by experts, that is, people competent in specialised fields of knowledge. Experts are frequently asked by politicians to provide scientific evidence that can be used to make scientifically sound (or at least scientifically justifiable) policy decisions. In order to develop 'sustainable' policies it is in fact necessary to have some knowledge of the actual and potential environmental impacts of certain activities and some knowledge of the technical characteristics, economic costs, social acceptability and possible side effects of alternative policy options. However, disagreements between experts often emerge over data-gathering methods or over the interpretation of a particular body of evidence. Moreover, even scientifically uncontroversial evidence can be used in various ways by policy makers. The complex interface between science and policy therefore needs to be researched in order to deepen our understanding of how environmental issues are constructed. This in turn influences the way those issues are dealt with in practice. Some examples may illustrate the points to be analysed.

In 1985, *Nature* magazine published an article by J. Farman and other researchers of the British Antarctic Survey, presenting the first scientific evidence of the 'ozone hole'. This evidence had been provided by ground-based measurements in two measuring stations in Antarctica. At first, most scientists were sceptical. The British Antarctic Survey was not yet well known in the scientific community involved in ozone research. It was thought that if huge ozone losses were occurring, satellites would have picked them up. Scientists of NASA's Goddard Space Flight Center reviewed the satellite data that could have detected a large ozone loss, and realised that they had overlooked the computer data that showed the ozone hole. This was owing to the fact that, since instruments sometimes gave measurements known to be anomalous, the Goddard scientists had programmed their computers to throw out any

measurements of ozone below 180 Dobson units, which was considered impossible (Roan, 1989). This example clearly shows how data-gathering and selecting methods, and the status of certain scientists within the relevant expert community, may stimulate or prevent certain data being regarded as evidence.

The second example refers to a controversy between scientists over the construction and interpretation of estimates. In its 1990–1991 report on the global environment, the World Resource Institute (WRI), a well-known US environmental research and lobbying organisation, published some estimates of net emissions and sinks of greenhouse gases for various countries. This provoked strong criticisms by scientists of India's Center for Science and Environment, who argued that the estimates provided by WRI were biased because net emissions depend on where natural sinks are located and because CO₂ and methane emissions from deforestation in developing countries had – in their view – been overestimated by WRI (Agarwal and Narain, 1990). More generally, the Indian scientists argued that WRI's estimates seemed to be intended to blame developing countries for global warming and to perpetuate global inequalities. This case indicates that, on the one hand, well-known scientific sources are not universally trusted and that, on the other hand, scientists in different social contexts and countries may look at data from different perspectives, perspectives that are influenced by – among other things – concerns regarding the implications and uses of evidence for policy purposes.

Many other examples of the construction of scientific evidence and the social determinants of scientific controversies could be provided. Among these are the controversies over the health risks of low doses of radiation or over the carcinogenic properties of chemical substances such as aldrin and dieldrin or the environmental damage caused by the transboundary impact of acid rain. For the present let us look at some of the main points arising from case studies which help us to interpret the relationship between science and environmental policy making.

The social embeddedness of science

Studies on the sociology and history of science emphasise the embeddedness of science in its social and historical context. In particular, they argue that all observations and statements of fact are theory – and value-laden. Scientists are socially situated reasoners rather than bearers of universal truth. Specific orderings are constructed – rather than revealed – in sequences of activity which, however attentive to experience and to formal consistency, could nonetheless have been otherwise and could have had different results.

Even more specifically, several sociologists and philosophers of science point out that what is 'seen' and selected as relevant evidence, and how such evidence is interpreted, is conditioned by a variety of factors. Among them are the organisation of laboratory practices and scientific work; the influence of previous theories and schools of thought; the impact of peer review and criticism of relevant expert communities; the constraints imposed by financial resources allocated to research and the technical equipment available; and the value attributed to scientific knowledge in different cultural and political systems (see Barnes and Edge, 1982; Hesse, 1974; Knorr-Cetina, 1981; Kuhn, 1962; Ravetz, 1971).

Scientists are in many cases aware of these issues, as is proved by the debates within the scientific community on the limits of science, the social responsibility of scientists, and so on. However, the diffusion of these debates is constrained by two factors. On the one hand, certain scientific institutions continue to defend the absolute objectivity and neutrality of science, in order to preserve a status of 'bearers of truth' they might otherwise lose. On the other hand, this attitude is reinforced by policy makers who ask scientists to provide 'certainties' that can guide or justify policy decisions.

The social embeddedness of science reveals itself rather clearly in the provision and use of policy-relevant evidence. In analysing the process of standard-setting, Giandomenico Majone (1983) notes that such processes can be regarded as a micro-cosm reflecting conflicting epistemologies, professional values, regulatory philosophies and national cultures. Moreover, Sheila Jasanoff (1987) emphasises that the very border between science and policy is often controversial and socially determined. It is in fact difficult to define where science stops and politics starts in order to determine, for example, which air or water quality standards would best protect health and the environment. Always value judgements must be made regarding the degree of protection to be achieved.

With regard to this last point another important element, stressed by Brian Wynne (1987) and other scholars, is the credibility of scientific experts (see Box 1). Only if experts are credible can they influence policy decisions and provide advice that will be listened to by governmental and non-governmental actors. In turn, the credibility of experts is based on social relationships by which trust or distrust is developed and through which the authority of experts is at the same time institutionalised (in research, professional and advisory organisations) and challenged (for example, in cases of major technological accidents that challenge experts' ability to deal with the unintended effects of the products of their own knowledge).

Trans-science, half-knowledge and the management of uncertainty

The influence of expert advice in the policy process is documented by other case studies that reveal not only the power of expertise in defining problems and identifying possible solutions, but also the use of specialised knowledge by policy makers to legitimise their decisions (see Barker and Peters, 1993). The potential legitimating function of science in the policy-making process is addressed by the concept of 'half-knowledge' first introduced by Lazarsfeld (1967) and developed by Marin (1981). According to these authors, decision makers do not necessarily try to obtain all the information which is or could be made available and is relevant to the problems and the identification of solutions; rather, they select the information they need on the basis of their goals and resources. In other words, they look for a half-knowledge that can be safely organised into politics, avoiding the knowledge that could provoke embarrassment and conflicts. The attempts made to underplay the impact of major technological accidents or the long-term and transboundary consequences of pollution problems such as acid deposition are cases in point. At the same time, the selection of half-knowledge is not completely arbitrary. For example, politicians cannot pretend that certain data do not exist if these data are widely known within and beyond scientific communities or national borders. In other words, the available knowledge



Experts' credibility and the protection of the Mediterranean

An illustration of the importance of expert credibility in the definition of environmental problems is offered by the case of the protection of the Mediterranean Sea. Expert groups, mainly ecologists and marine scientists, have played a crucial role in defining the problem. In fact, they were the ones to suggest that the Mediterranean is a vulnerable ecosystem to be protected as a whole. Moreover, the lobbying by experts – or by 'epistemic communities' as Peter Haas calls them (Haas, 1990) – through scientific advice to governments and international organisations was instrumental in launching the Mediterranean Action Plan of the United Nations Environment Programme.

The concept of the epistemic community may be regarded as problematic, since it seems to take for granted the objective nature of the 'episteme' knowledge and the legitimate role of expert 'communities' in proposing camps of action. The point of interest here is, however, the major influence of experts in the policy process. The Mediterranean case shows that if the experts involved had not been credible, both within the respective professional communities and in the eyes of policy makers, they could not have had this influence in defining the problem and suggesting actions aimed at coping with it. At the same time it must be stressed that other extrascientific reasons, particularly the economic and strategic interests of some coastal states in the Mediterranean area and the interest of some international agencies in playing a leading role with regard to environmental issues, favoured the emergence of the idea of developing international co-operation to protect the Mediterranean.

limits the discretion of politicians in the choice of half-knowledge. Such discretion appears to be greater in cases where the knowledge available is controversial and uncertainties are more evident.

With regard to this last point, a concept that must be taken into consideration in analysing the interaction between policy making and controversial science is the concept of 'trans-science'. This concept was introduced by Alvin Weinberg (1972) to characterise those questions that can be stated in scientific terms but that are, in principle, beyond the proficiency of science to answer. Following Weinberg, questions such as the risks of low doses of radiation transcend science. Getting answers to such questions would be prohibitively expensive. In any case the matter might be too variable to enable research to proceed according to the generally accepted methods of scientific inquiry. A further problem, and one which was debated in the previous chapter, is that questions often involve moral or aesthetic judgements to be made in seeking answers.

The distinction between science and trans-science points to the important issue of the limits of science and the need to live with scientific uncertainties and controversies. At the same time, such a distinction is problematic. It assumes in fact that a clear-cut distinction can be made between facts and values, object and subject and this is at least controversial. Furthermore, the distinction between science and trans-science raises the problem of institutional power, that is, who should determine where the line

between science and trans-science is to be drawn and, once a line has been drawn, who should decide the controversial trans-scientific issues.

The discussion on half-knowledge and trans-science brings us to a crucial aspect of the interaction between science and policy in defining environmental issues and formulating possible solutions, that is, the management of scientific uncertainties. As Jerome Ravetz and Silvio Funtowicz (1989) write, 'We now face "hard" policy decisions (involving huge investments and the fates of many people) for which the necessary scientific inputs will be irremediably "soft", uncertain and contested'. The debate on climate change is a highly significant example of this situation. Scientific uncertainties characterise the identification of the causes and, even more, the understanding of the mechanisms and the forecasting of the scale, timing and impact of climate change. At the same time, the development of policies aimed at stabilising or reducing the emissions of greenhouse gases would require huge financial investments – including financial aid to assist developing countries in controlling their emissions – and the restructuring of entire economic sectors such as energy production and transport. Uncertainties also characterise the assessment of the various policy options in terms of their economic costs, social acceptability and political implications at the global, national and local levels. In other words, social science uncertainties, as well as natural science ones, must be dealt with.

An examination of how uncertainties have been managed in the context of the debate on climate change helps us understand the interaction between the framing of environmental issues and the way decisions on environmental matters are made.

In the face of uncertainty three possible courses of action can be identified. Decision makers may either:

- decide to wait for more information
- take a decision while taking uncertainty into account
- take decisions while neglecting or even hiding uncertainties.

The first two alternatives were those most commonly advocated in the climate change debate. The Bush administration in the USA strongly advocated – especially during the negotiations of the climate change convention that took place before and at the UNCED Conference – the need to reduce scientific uncertainty before deciding upon stabilisation and reduction targets (option 1). This would enable the US to evade or delay the actions needed to meet targets. The European Community, the Scandinavian countries and the Alliance of the Small Island States advocated instead the need to take precautionary action (option 2), that is, setting targets and developing policies on the basis of the available evidence and uncertainties. They argued that postponing action could mean starting to act when it is too late.

In spite of the reference to opposing principles, 'wait-and-see' versus the 'precautionary principle', most of these governments agreed that 'no-regret policies' should be developed, that is, policies that may help combat global warming and at the same time are beneficial to the economy. In this context emphasis is put on energy efficiency measures. In other words, what is economically and politically more feasible and palatable determines the way uncertainty is actually dealt with. In this respect it is worth stressing the interaction between issue framing and decision making. On the one hand, the way a problem is framed influences the way that problem is dealt with. In our

case, the definition of the problem as a global environmental issue mainly caused by greenhouse gas emissions, but characterised by many uncertainties, influenced the formulation of policy actions. But the opposite is also true: the feasibility of certain actions influences the way a problem is framed. This is reflected, for instance, in the emphasis on energy efficiency measures to stabilise CO₂ emissions in the climate change debate.

This last remark points to the fact that natural science findings need to be ‘translated’ in political and economic terms to become policy issues. It was only when climatological models and theories started being translated in terms of the economic costs of possible impacts, and of the (economic and administrative) feasibility and social acceptability of policy options, that the risk of climate change became a policy issue as well as a research issue (see Liberatore, 1994).

3.3 The social construction of environmental problems

The example of ‘risk’

We turn now to a second theoretical issue of concern to sociologists, the argument that environmental problems are socially constructed. A good way of discussing this issue is to take the notion of ‘risk’, a notion that is widespread in debates and policies in the field of environment.

Within the framework of risk assessment studies, risk is seen as a measurable phenomenon. It is often defined as the predicted magnitude of a loss or damage multiplied by the probability of its occurring. In spite of this precise definition, several aspects can be identified that make risk assessment a far from objective procedure.

Subjective elements are first introduced in the selection of population samples, extrapolation functions and so on (see Fischhoff *et al.*, 1981; Renn, 1985). What is more, studies in risk perception show that whether something is regarded as a risk, and as a more or less acceptable risk, depends on several social factors. The list of these factors includes considerations such as whether the risk is taken voluntarily or not; whether the risk is controllable; whether exposure is a necessity or a luxury; whether the consequences may affect especially sensitive groups of the population, like children; whether the possible effects are immediate or delayed; whether they are reversible; and so on (Lowrance, 1976; Slovic *et al.*, 1982). Cultural studies also emphasise that the way people perceive risks cannot be separated from their position within society and from the way they experience and judge social relations and institutions (Douglas and Wildavsky, 1982; Reynier and Cantor, 1987) (see Box 2).

According to the reasoning presented above it can be stated that what is (or is not) regarded as a risk is a matter of perception, and this in turn is conditioned by social relations. In other words, risks are not objective entities but social constructs. This does not mean that risks are imaginary and that the probability of actual damage arising is just a matter of perception. Rather, to say that risks are social constructs means to acknowledge that a discussion of the risk of global warming or the extinction of certain species is the result of a complex process, involving the selection and interpretation of

Societal perceptions of risks

Issues such as waste disposal and the control of high-risk technologies like nuclear power and biotechnology provide useful illustrations of societal definitions of risks. Opposition to the siting of waste facilities (especially in the case of toxic and nuclear waste) often involves arguments regarding the unfair distribution of health and environmental risks over different sectors of society – those who live nearby and those who live far away from the site – and/or different generations. Those arguments in turn imply judgements – in this case judgements based on the category of fairness – about social relations. Likewise, perceptions of the controllability of high-risk technologies (see Perrow, 1984) involve judgements about the capabilities and the accountability of the relevant scientific and political institutions in dealing with the risk of serious, widespread and irreversible damages. In both cases, and in many others, different perceptions and judgements can emerge across societies and within the same society, depending on the prevailing social values and relations.

evidence, the emergence and diffusion of environmental awareness, and the willingness of certain actors to deal with the risk as a matter of environmental, economic, energy or other sectoral policies, international negotiations and/or media coverage.

A more detailed discussion of the construction and management of risks in a specific context is provided later in this chapter in the section on Chernobyl (3.5).

The framing of issues

The line of argument suggested with regard to the notion of risk also applies to the notion of *issue*. Several sociologists point to the social construction of issues, that is, the way certain events and experiences are interpreted according to ‘cognitive frames’. Such frames include perceptive abilities – such as memory – and judgements based on previous experience and/or socialisation processes. According to one of the most influential sociologists in this field, Erving Goffmann, some ‘primary’ cognitive frames are needed to render what would otherwise be a meaningless aspect into something that is meaningful (Goffmann, 1974). Cognitive frames are, in turn, developed through the interactions between actors living in a specific society.

With regard to environmental issues it is especially important to look at the way Nature and the interactions between Nature and human beings are perceived. According to Michiel Schwarz and Michael Thompson (1990) it is possible to distinguish four main ‘myths of Nature’: Nature benign, tolerant, capricious or ephemeral. These views influence the way actors frame environmental problems. For instance, if someone regards Nature as ephemeral, they will consider any form and quantity of pollution as dangerous and to be prevented or eliminated. By contrast, if someone thinks that Nature is benign, they will view certain forms and quantities of pollution as unimportant, since Nature will be able to cope with them.

It must be stressed that these myths of Nature are the result of social conditions. For example, the view of Nature as benign appears to be related to industrialisation processes characterised by the use of environmental resources as a mere basis of and

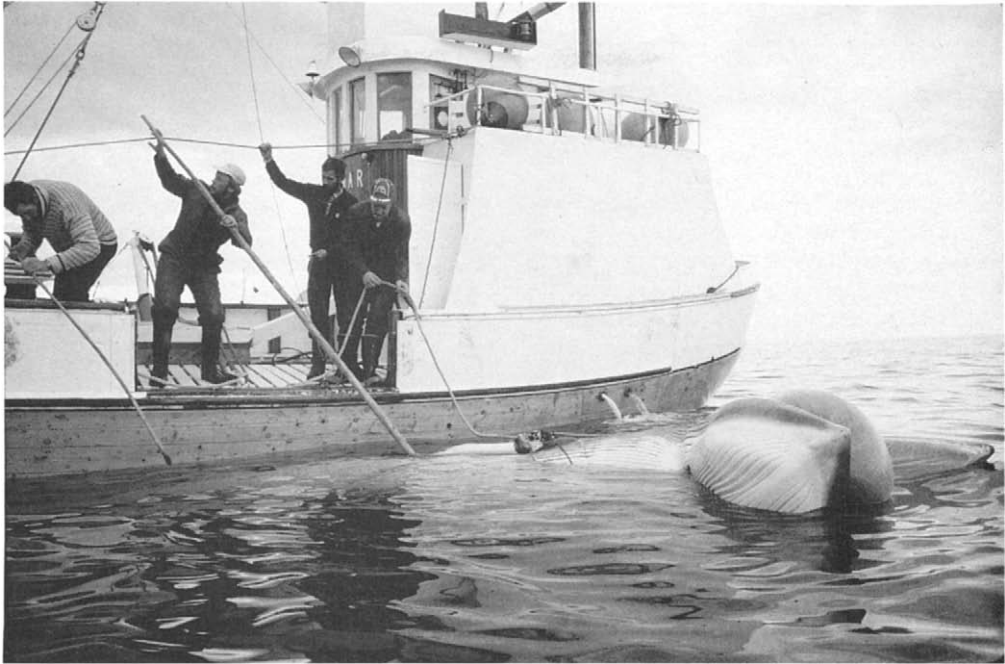


Plate 3.1 Issue framing: 100 years ago whaling was common practice. Nowadays, public opinion has changed. The photograph shows a slaughtered Minke whale being hauled aboard a Norwegian whaling boat on the Barents Sea. Photo: EIA/Lineair

material for production. Such views are mainly held by business actors or by low-income social groups interested in limiting the environmental constraints on economic activities in order to make profits or preserve jobs. The alternative view of Nature as ephemeral appears to be related to environmental movements, especially, though not exclusively, in industrialised countries.

According to Inglehart (1977) the adherence to ‘post-materialist values’, i.e. values that pay greater attention to ‘quality’ – including environmental quality – than ‘quantity’, characterises contemporary Western societies. This focus on quality must be understood as largely shaped by changes in economic structures (decline of heavy industry, growth of the services sector, diffusion of information technologies), and by social and political processes (such as education and democratisation) that favour the emergence of social movements, including environmental movements (see Box 3).

However, the attention paid to ‘post-materialist values’ in industrialised countries should not lead to the underestimation of consumerist attitudes and behaviour in these countries, nor should it lead to the assumption that people of lower-income countries are concerned only with material values and cannot be mobilised for environmental protection. It is true that poverty and economic development are the main concern of developing countries. It is worth stressing, however, that attention to environmental quality and opposition to instrumental views of Nature characterise citizens’ movements, like the Chipko movement in India or the Green Belt movement in Kenya, both mainly composed of women.

Green movements and environmental attitudes

The emergence and evolution of green parties and environmental movements as new and often influential social actors at the local, national and international levels have been extensively analysed (see, among others, McCormick, 1989; Rudig and Lowe, 1992). Green parties are generally seen as political actors that introduce not only new – environmental – topics but also different organisational forms and practices into the traditional political system. This also partly applies, but in a more ‘diffused’ way, to the role of environmental movements. Apart from parties and movements, the environmental attitudes of the broader public are being scrutinised through opinion polls and other means. The resulting data represent useful indicators of the spread and/or depth of concern about certain environmental issues in selected sectors of the ‘public’. However, the reliability and significance of these data are obviously very much dependent on the methods used and on the selection of samples. Therefore, the gathering as well as the interpretation and use (for example, by the media) of data on ‘public’ environmental attitudes is more problematic than the interpretation of more focused studies on green parties or environmental organisations.

These two movements point to the fact that environmental issues are framed not simply on the basis of the emergence of physical phenomena (like the depletion of certain natural resources) or according to objective cost–benefit calculations. They largely depend on the prevailing cultural values within different societies (such as the holistic view of Nature and the consideration of humans as components of Nature in certain cultures) and on the prevailing social relations, including the social conditions of women and their role as daily managers of the living environment (see Dankelman and Davidson, 1988; Shiva, 1988).

Another example of the way environmental issues are framed in different social contexts might be the way people look at trees and the deforestation issue (see Box 4).

The different framings of the deforestation issue mentioned in this example are the result of several factors, including the different social conditions, geographical location, economic interests and main values of the relevant actors. These different factors also contribute to making certain cognitive frames prevail in certain societies or in certain social groups. An ‘ecological cognitive frame’ will thus interpret the deforestation issue mainly in terms of environmental protection, such as the need to preserve biodiversity, combat climate change or prevent desertification and soil erosion. A ‘human rights cognitive frame’ will emphasise the view of deforestation as a danger for and crime against indigenous populations. An ‘economic growth cognitive frame’ will instead favour the emphasis on deforestation as an economic issue to be dealt with in terms of cost-benefit calculations, trade conditions, and contributions to the gross national product.

Why trees are not only trees

Trees are such concrete and obvious things that it may seem strange to realise that trees are almost never simply trees but may be timber for export/import to one person, carbon sinks to someone else, sacred symbols or aesthetic objects to others, and so on. If trees are viewed differently by different people, 'what happens to trees' is also a matter of different perceptions and evaluations. Cutting down or burning trees can be viewed as a terrible attack on the preservation of biodiversity or on the beauty of landscapes, as a factor that contributes to the risk of global warming, as an action required for the building of infrastructure or for decreasing the debt burden through timber exports, as a direct threat to the survival of populations living in the forest, and so on.

Changes and learning

The way issues are framed is not a static phenomenon. Changes occur all the time, a particular issue becomes more or less important, urgent or problematic, and more or less linked with other issues. At the same time, new issues enter the agendas of governments, international organisations, mass media, business organisations, environmental groups and other collective actors or individuals. These changes require certain conditions. For instance, for an issue to enter the political agenda of governments or international organisations it is necessary that someone pushes to get that issue there. In this respect, John Kingdon (1984) points out the important role of 'policy entrepreneurs', that is, persons who dedicate time, energy and financial resources to advocating the importance of a certain issue. Moreover, several feasibility conditions decide whether or not an issue enters the political agenda as well as the agendas of the mass media, environmental groups, business organisations or scientific communities. These conditions include the resources that can be allocated to addressing a certain issue, and whether the issue clashes with or meets the interests of the most powerful actors in the various contexts. Also, as was mentioned above, certain structural conditions like the transformation of the economy in certain countries and periods of time influence the emergence of new values and issues.

In addition to those conditions that influence the emergence of new issues within the agendas of different actors and within societies at large, the changes in the framing of issues and the very development of new frames involve learning. It is by learning from experience, from new information and knowledge, and from each other's views that new ideas emerge and old problems are looked at in a different way.

Learning is an intrinsically social process. As was pointed out by sociologists like Klaus Eder (1985) and Max Miller (1986), learning can only occur through the communicative experience that takes place in given social and historical contexts. Learning does not necessarily lead to improvements, since one can learn erroneous lessons and negative behaviours, as past and contemporary events (such as wars) have demonstrated. Moreover, learning can be constrained by several factors, such as the resources of the potential learners. For instance, one cannot learn from new scientific evidence or from the experience of others if information is not accessible because of

Learning and ‘sustainable development’

The evolution of the ‘sustainable development’ frame can be schematically summarised as a process in which the opposition between environmental protection and economic growth that was conceptualised in the early 1970s (especially in the 1972 Club of Rome report) is substituted by the idea that environmental protection and economic development are interdependent. Such processes have involved the participation of many organisations and individuals and have been marked by a number of important events, such as the Stockholm Conference on the Human Environment held in 1972 (where the core of the sustainability concept was advanced in the Action Plan), the work of the Brandt Commission and then the Brundtland Commission, the circulation of the Brundtland Commission’s report *Our Common Future* (suggesting the most influential definition of sustainable development) and the Rio Conference on Environment and Development. These events represented fora of communication where the individuals and organisations involved learned several, and often different, lessons.

In broad terms it can be said that environmentalists (see, for example, *Caring for the Earth* by WWF) learned that a clear-cut opposition between environment and development was neither acceptable – especially for people in developing countries – nor viable; nobody in fact seemed to be prepared to renounce economic prosperity for the sake of protecting the environment, even though some may be willing to limit it. Economic actors (such as the Business Council for Sustainable Development) learned that environmental concerns had to be taken into account and that the sustainability concept could be used as a means to tackle these concerns without too radically questioning certain economic activities. Policy makers learned that it was necessary to link environmental and developmental issues in order to develop feasible policies and conclude international agreements. A case in point would be the link between CFCs reduction and the transfer of CFC substitutes to developing countries in the context of the international negotiations on the convention for the protection of the ozone layer.

costs or political constraints. Still, learning must be taken into consideration when analysing changes in the framing of issues.

With regard to environmental issues, an especially significant case of ‘reframing’ that involves learning is represented by the emergence of the concept of ‘sustainable development’ (this concept is focused on in Chapter 7) (see Box 5).

While the reframing of the relations between environment and development in terms of sustainability represents a remarkable conceptual change with important practical implications, it has not yet led to visible improvements. In fact, putting into practice the idea of sustainable development requires an integration of political will, economic and technical resources, knowledge of natural and social processes and changes in social values and behaviours that is very difficult to achieve.

The theoretical sections have focused on the interaction between science and policy and on the social construction of environmental issues and policy making. We go on now to look at two examples of policy making in order to put some of these theoretical principles into an empirical context.

3.4 Why did the depletion of the ozone layer become a policy issue?

This section and the next attempt to decide whether the suggested theoretical discussion helps us understand why something becomes an environmental policy issue. The examples analysed are drawn from larger and more in-depth case studies on the responses in different countries and by different actors to ozone layer depletion and the Chernobyl accident. Of course, the short accounts and discussions offered in the following pages are necessarily selective. Readers can find more detailed accounts in texts included in the reference list and in other contributions to this book.

The discussion of the ozone layer depletion issue focuses on the cases of the United States, the European Community and the former USSR; moreover, reference is made to the position of some developing countries.

The USA case

In the USA the risk of ozone destruction was first addressed as a policy issue in a Congressional debate on supersonic transport aircraft (SSTs). Following this debate the Department of Transportation formed an advisory panel on atmospheric problems from SSTs. The risk of ozone depletion from SSTs (already indicated in studies by J. Hampson who worked on the possible impacts of nuclear weapons on the ozone layer) was discussed in the influential MIT-based Study of Critical Environmental Problems

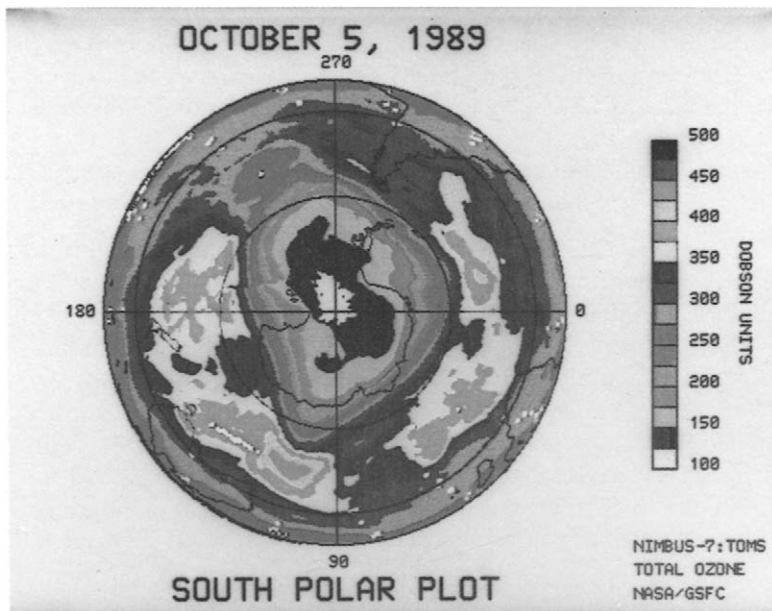


Plate 3.2 Scientific evidence of the hole in the ozone layer above the Antarctic, October 5, 1989. Photo: NASA

(SCEP) of 1970 as well as at Congressional hearings. At the same time, the development of the supersonic Concorde aircraft in Britain and France provided the practical issue to be dealt with; as was mentioned above, that issue was explicitly included in the transport policy agenda. Limitations on or even a ban of Concorde flights and the blocking of funds for SST development in the US were suggested (by governmental agencies and environmental NGOs as well) and were approved in the mid-1970s. In the subsequent years the risk of ozone destruction due to SSTs faded from the US governmental agenda. The fading out can be explained by new research that refuted the hypothesis of the impact of SSTs on stratospheric ozone depletion. It is worth noting that such results coincided with strong economic interests both within the US and abroad (mainly Britain and France).

While the impact of SSTs slipped down the agenda, the risk of ozone destruction due to human intervention did not fade away as a policy issue. In December 1974, a first bill on banning aerosols was presented to Congress. This happened a few months after the publication in *Nature* of the article by M. Molina and S. Rowland, which was the first to point out the role of CFCs in depleting the ozone layer. Besides scientific reviews, Congressional hearings were held on this topic. Since 1974, the depletion of the ozone layer due to CFCs – and other substances discovered later to have an ozone-depleting potential – remained an important policy issue on the US domestic environmental agenda. Local and state bans on CFCs, advocated by, among others, Rowland, were passed in 1974 and 1975, and a Federal ban on ‘non-essential’ CFC uses was jointly issued by the Environmental Protection Agency, the Food and Drugs Administration and the Consumer Product Safety Commission in May 1977. It also emerged as an important issue in the US external relations environmental agenda (the US led the adoption of the Vienna Convention and its protocols aimed at protecting the ozone layer). These measures had been enthusiastically supported by environmental NGOs and were not strongly opposed by the US chemical industry. (While still lobbying against bans on CFCs, Du Pont announced research on substitutes for CFCs as early as 1976.)

On the basis of this schematic account, the following points can be made with respect to the process by which ozone layer depletion became a policy issue in the US:

- Scientific models and theories played an important role in ‘pushing’ the risk of ozone layer depletion onto the US policy agenda; but a difference can be noted between the SST case and the CFC case. In the case of SSTs, it is likely that US economic interests in the transport sector favoured or even determined the introduction of the SST/Concorde issue into the (transport) policy agenda, which means that the reference to and appreciation of scientific evidence can be regarded as functional and ancillary to economic interests. In the case of CFCs, by contrast, scientific input appears to have been the main source of cognitive change, since powerful economic sectors had an interest in preventing, rather than facilitating, the depletion of the ozone layer becoming a policy issue at that time (i.e. before the development of alternatives to CFCs).
- The importance of scientific inputs cannot be separated from the communication patterns between the relevant actors in producing, selecting and using those data. Policy makers could learn from data because they could and were willing to learn

from scientists. This can be explained in terms of the authority and credibility of the relevant scientists, the reliance on science that characterises the US regulatory system, and the nature of a policy making process that involves not only experts and governmental actors but also the mass media – covering the scientific ‘news’ – and NGOs. These actors referred to scientific evidence to support the call for action.

- Another point worth stressing is that regulatory experience regarding the control of other health and environmental risks facilitated the transformation of ozone layer depletion into a policy issue. Particularly important in this respect was the previous experience of the Environmental Protection Agency and the Food and Drug Administration with policy instruments such as the banning of certain dangerous substances. An important element enabling a problem to become a policy issue is the possibility of doing something about it. Previous experience with certain instruments represents a valuable source of policy lessons.
- Finally, as regards the impact of the cognitive transformation of the atmosphere into a policy issue, two main elements are worth noting. First of all, the persistence (and related influence) of ozone layer depletion due to CFCs as a US and international policy issue can be partly explained by the strength of the scientific hypothesis first advocated by Molina and Rowland and then confirmed by monitoring data. Moreover, this persistence was also facilitated by the activism of Rowland himself and other scientists, several environmental NGOs, members of Congress and governmental agencies (and then international organisations, etc.) as ‘policy entrepreneurs’.

Secondly, the timing and weight of the policy actions taken in the US to protect the ozone layer once this had become a policy issue can be explained in the light of the viability (administrative, economic, political, social and technical) of the actions proposed. The reasons why those actions were viable in the US context and not in others require explanations in terms of interest, power relations and institutional structures as well as social perceptions and cognitive change. The USA case is explored in more detail in Dickson *et al.* (1992).

The EC case

The first emergence of ozone layer depletion as an EC policy issue was the EC Commission’s proposal for a Council Recommendation on ‘Fluorocarbons in the Environment’, issued in August 1977, that is, a few months after the US ban on non-essential uses of CFCs. In this document the Commission proposed to regulate production capacities of CFCs. In May 1978, the Council issued a Resolution (a non-binding EC measure) based on the Commission proposal. In 1979, a new proposal for a Council Decision on the same subject was made by the Commission. This proposal became the basis of the Council Decision of 1980 on CFCs and the environment, the EC’s first binding regulatory action on the subject.

Unlike the US ban, the EC Commission’s proposals and the related Council Resolution and Decision focused on limits to the production capacity of fluorocarbons. This was mainly a result of pressure from chemical industries based in EC countries and organised at the EC level, which opposed strict measures. References to the US ban were avoided in the Commission proposal; reference was made instead to actions

taken within EC member states (such as voluntary agreements on the reduction of CFCs in aerosol cans adopted in the FRG in 1977). Moreover, the international scientific debate – and especially the existing scientific uncertainties – on the risk of ozone layer depletion from CFCs (including its impact on human health) was mentioned by the EC institutions. Reference was made to studies published by the World Health Organisation and UNEP, and later on to various assessments made in the US and UK on ozone layer depletion (the second questioning the reliability of the first). EC-sponsored research activities relating to ozone layer depletion followed, rather than anticipated the emergence of the ozone issue on the EC policy agenda (unlike the US case and the EC context with respect to other issues such as climate change). The first EC scientific conference on the ozone problem was held in 1981, and EC-sponsored research in the area started in the late 1980s.

The pressure by environmental NGOs on EC institutions with respect to the ozone issue also followed rather than stimulated the start of work on an EC ozone policy. Criticisms and pressure on the EC Commission by groups such as the European Environmental Bureau started in the mid-1980s, especially on the occasion of international events such as the Vienna Convention.

Interesting differences between the EC and US cases emerge from the reconstruction outlined above:

- First of all, it can be argued that ozone layer depletion became an EC policy issue as a reaction to previous policy actions in the US, in other non-EC countries and in some EC member states. Existing economic interests and the link between the ozone issue and the EC trade policy, rather than reliance on and learning from scientific evidence, appear mainly to explain the emergence of the atmosphere as an EC policy issue. Scientific evidence was referred to in order to justify the response to previous regulatory actions rather than to learn about the nature and seriousness of the risk.
- At the same time it must be noted that exchange of information and communication between scientists and between governments at the international level favoured the emerging of an awareness of the problem (as the EC Commission proposal of 1977 expressed it, the Commission ‘feels that something has to be done’ about the ozone layer depletion problem) and the consequent evolution of the EC response. International fora such as scientific and intergovernmental conferences diffused information about the actions taken or planned in some countries regarding CFCs, and spread the scientific, political and/or economic arguments used to support those actions. In this way these channels of communication contributed to the modification of the perception of the interests at stake for the EC countries and institutions, even though the EC initially remained sceptical about the seriousness of the environmental dimension of the ozone issue.
- Another striking aspect is that, unlike the US case where environmental policy and agencies such as Environmental Protection Agency and Food and Drug Administration were rather well established, the comparatively recent development of EC environmental policy (the first EC environmental action programme was adopted in 1973) limited the EC’s opportunities to draw lessons from previous regulatory experience. The as yet weak institutional structure of EC environmental policy (in terms of personnel, budget, etc.) also limited its bargaining power with respect to

strong interest groups and the opportunities to make use of lessons that could be 'unpalatable' to those groups.

- Finally, it must be stressed that EC policy making is a relatively closed process, based on bargaining within and between the different EC institutions, between them and the member countries, and between EC institutions and governments and powerful interest groups. Environmental NGOs, citizens' initiatives and the mass media have easy access to the public aspects of these bargainings, but limited access to and little influence on the informal negotiating process. This situation represents a constraint on the communication process and influenced the way the ozone issue was framed in the EC context. A detailed appraisal of the EC case is provided in Huber and Liberatore (1993).

The USSR case

It is interesting to compare the previous cases with that of the former USSR. Two questions must be asked: 'Why did ozone layer depletion not become a policy issue in the USSR in the 1970s?' and 'Why did it become a policy issue later on?'. These questions can help us improve our understanding of the conditions which allow something to become an issue.

In the USSR, the ozone layer failed to reach the policy agenda in the 1970s. One reason for this is that no one tried to get it there. Scientists studied the problem but did not advocate policy measures to cope with it as Rowland did in the US. Scientific research on stratospheric ozone had been conducted in the USSR since the 1930s, while theories about the risk of ozone destruction by nitrogen components and by freons were discussed in the early 1970s, and a book dedicated to the ozone depletion issue was published by Alexandrov and Sedunov in 1979. The latter referred to the views of those who denied the existence of an ozone layer depletion problem. The late 1970s and early 1980s can be regarded as the turning point in the attitudes of officials in the influential state committee on hydrometeorology, Hydromet. Previously sceptical risk assessments were being gradually transformed into a recognition of the seriousness of the risk and of the need for further research. While environmental protection laws were in place in the USSR at that time, a comprehensive environmental policy and specialised institutions did not yet exist. Thus, there was no governmental agency in charge of environmental protection which could pick up ozone layer depletion as a policy issue, as the EPA did in the US and the Directorate General for the Environment did within the EC Commission. Furthermore, in the 1970s (and up until the late 1980s) the Soviet press did not pay any attention to the ozone layer depletion issue, and environmental NGOs were not in evidence in the USSR in that period. Given this situation, ozone layer depletion was hardly perceived as a risk by large sectors of society. It mainly remained a scientific, 'abstract' issue, dealt with by experts.

On the basis of these remarks, three main elements appear relevant with respect to the framing of the ozone issue in the former USSR:

- First of all, such framing was determined and constrained by the number and kind of actors involved in the debate on ozone layer depletion. As emerges from the case studies relied upon, the 'ownership of the ozone problem' – as Joseph Gusfield would call it (Gusfield, 1981) – was held by a specific actor group, government

scientists. Such 'ownership' was in turn favoured by the hierarchical power structure and the very restricted communication channels (channels mainly linking party and governmental bodies, but inaccessible to most citizens). In other words, structural elements and the tendency on the part of the 'owners' of the problem to regard it as a merely scientific one blocked the transformation of ozone layer depletion into a policy problem in the USSR in the 1970s.

- With respect to the debate within the scientific community, it can be argued that the competition between different well-established scientific traditions and communities in the USSR and the USA probably limited the willingness of Soviet scientists to acknowledge the importance of results originating in the US. At the same time, this element and some reciprocal diffidence between scientists in different locations limited the circulation of criticisms by Soviet scientists that could have been constructive in the international debate.
- As regards the later emergence – in the late 1980s – of the ozone layer as a policy issue, the most important factor appears to have been that the new foreign policy agenda formulated by Gorbachev, Shevardnadze and others picked up global environmental issues as a component of the new collaborative view of *perestroika*. The perception and use of global environmental problems within such a context appears to be an interesting case of learning how to reframe and use an environmental problem in a foreign policy context. This process was not limited to the former USSR; it also happened in other countries (including the US and the EC) and characterises the development of an 'environmental diplomacy' worldwide. More detail on the USSR case can be found in Prokop (1990) and Nikitina *et al.* (1992).

Developing countries

The ozone issue was framed in a different way in developing countries like China and India.

During the negotiations on the Montreal protocol on substances that deplete the ozone layer, some Indian officials framed the problem as a 'rich man's problem – rich man's solution'. Chinese and Indian delegates argued that it was unacceptable for developing countries either to have to forego necessities such as the use of products containing CFCs for food preservation and air conditioning or to pay more for CFC substitutes and enrich the very chemical industries of rich countries that had created the ozone problem in the first place (see Benedick, 1991). It was only after a revision of the drafted protocol, a revision that included financial aid and technology transfer provisions more favourable to developing countries, that China and India announced they were ready to accede to the Montreal protocol.

It can be noted that the core of the debate during those international negotiations was the finding of solutions to the problem, rather than the existence of a problem *per se*. Chinese and Indian delegates did not question that ozone layer depletion was occurring and should be dealt with. What they questioned was a universalistic definition of a problem that in practice tended to be an 'industrialised countries-centred' definition. Ozone layer depletion is a global risk caused by CFCs and other chemicals, therefore everybody must stop using CFCs in the same way. Pointing to the differentiated responsibilities for causing ozone layer depletion and to the different resources

available to cope with it, Chinese and Indian delegates pushed for the explicit inclusion of questions of equity in the framing of the problem and of its possible solutions.

Summary

The analysis of the way in which ozone layer depletion became a policy issue in different contexts highlights some general points that relate to the discussion offered in the previous, 'theoretical' sections.

With regard to the interactions between science and policy, the case studies indicate that the way scientific evidence is selected and utilised depends on factors such as the credibility of scientists, the features of regulatory systems, the openness of the scientific and political debate and the economic and political interests at stake.

Another element worth pointing out is that the perception that something could and should be done to combat the depletion of the ozone layer emerged soon after the first scientific hypotheses on this phenomenon were circulated. Regulatory actions and technological options were advocated and implemented at national and international levels. At the international level, the different evaluations of constraints and potentials for action represented a major point of negotiation between developing and industrialised countries.

The last aspect also indicates that, even when a certain problem is acknowledged, the perception of its urgency, priority and links with other problems may differ substantially in different contexts. This aspect is particularly clear in the Chernobyl case.

3.5 Why did the Chernobyl fallout become a policy issue?

The different responses to the Chernobyl fallout represent another interesting illustration of the interplay between science and policy in defining a certain event as a problem or a non-problem. The Chernobyl fallout also represents a transboundary environmental problem that had a 'regional' dimension in terms of actual health and environmental damage, but was global in nature as regards the management of nuclear risks.

During the night of 26 April 1986, an occurrence calculated as extremely unlikely by refined risk assessment studies nevertheless took place. The meltdown at the fourth reactor of the Chernobyl nuclear plant was the beginning of an unfortunately still ongoing story of actual illnesses and deaths, together with deep uncertainties about the longer term consequences of the fallout. Unlike the ozone layer depletion, the Chernobyl accident was an immediately visible event. But, while the catastrophic dimensions of the Chernobyl accident were evident with regard to the impact on the population and the environment in the area near the plant, the transboundary consequences of the fallout gave rise to different interpretations and responses in different countries. A brief account is offered below of the responses to Chernobyl in Italy, the Federal Republic of Germany and France, in order to illustrate the reasons why the same phenomenon was framed differently in these neighbouring countries. More detail will be found in Liberatore (1992).

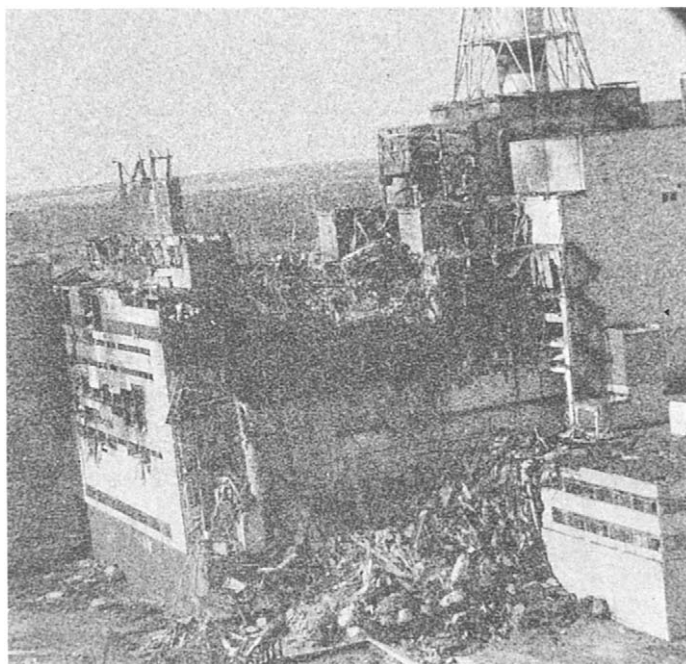


Plate 3.3 The damaged nuclear reactor number 4 at Chernobyl after the accident on 26 April 1986. Photo: SIPA Press/Sunshine

Italy

The first news of the Chernobyl accident dominated the front pages of the Italian newspapers on 29 April. Data and comments from Scandinavian, Soviet and US sources were reported, together with some reassuring statements from the Italian Minister of Civil Protection regarding possible consequences of the accident in Italy. On the previous day – as the first data on abnormal increases in radioactivity levels in Sweden reached Italy – a meeting had been organised by the Ministry of Civil Protection with experts of the National Health Council (ISS), the Agency for Nuclear and Alternative Energy (ENEA) and its safety division (ENEA-DISP). In spite of some disagreements on the evaluation of the available data, it was agreed to monitor radioactivity levels over the entire national territory.

On 1 May, the newspapers announced that radioactivity levels were increasing in Italy. The following day, the first countermeasures decided upon by the Minister of Health were announced. These included prohibiting fresh milk for children, no selling of leaf vegetables, plus some restrictions on the import of foodstuffs from Eastern European countries. Starting from that day, controversies over the necessity and suitability of countermeasures arose between different Ministers (especially between the Minister of Health and the Ministers of Agriculture and Industry, with the Minister of Civil Protection taking a midway position) and between experts (both between different governmental experts and between them and scientists associated with the

environmental movement). Furthermore, in some cases divisions and contrasts between central and local authorities emerged concerning the implementation of countermeasures. This arose partially as a result of the different levels of radioactive contamination detected in different areas, but it was also influenced by different attitudes (more or less prudent) of advisors and politicians in the various regions and municipalities.

Disagreements and conflicts among political authorities and among experts were reported by the mass media, which were, in turn, accused by some politicians and scientists of 'creating' confusion and of alarmism. The media also covered the initiatives taken by the environmental movement, like the mass demonstration (about 150,000 participants) held on 10 May in Rome.

In the meantime, Parliament also addressed the problem of the possible consequences of the Chernobyl accident in Italy and the actions to be taken. During parliamentary sessions in late April and May, leftist parties demanded inspections to verify the safety of the three operational Italian nuclear plants, together with a revision of the national energy plan. These parties, together with the Greens (who were not yet represented in Parliament) and various environmental associations, also promoted a referendum on nuclear power that was held the following year.

Controversies regarding the suitability of the measures adopted by the government at the request of the Ministry of Health continued over the entire period of emergency. The emergency was officially declared over by the Ministers of Health and Civil Protection on 20 May.

On the basis of this account, it can be noted that the Chernobyl fallout was framed in Italy as a national public health emergency. This 'frame' was proposed by some governmental experts (mainly those of Istituto Superiore di Sanità) and authorities (the Ministers of Health and Civil Protection). The antinuclear movement and 'counter-experts' supported it by stressing the danger of radioactive contamination and asking for countermeasures. The mass media covered extensively not only the news concerning the consequences of the accident in Ukraine but also the results of monitoring and the debate on the consequences of the fallout in Italy. In this way they contributed to the definition of the problem as a domestic, as well as foreign, emergency to be dealt with by the public authorities.

This 'emergency frame' was challenged by other governmental authorities (the Ministers of Agriculture and Industry), experts and interest groups (especially farmers). The reasons why it prevailed in spite of the opposition of powerful actors are to be found in several institutional and social factors.

As for the institutional factors, the Health Ministry had a clearly defined legal competence in the protection of the public against ionising radiation. This was very important, given that fallout due to a nuclear accident beyond the national borders was not provided for in the Italian legislation (nor in that of most other countries before Chernobyl). Besides having the legal resources, the Health Ministry also had the scientific ones, in the form of the ISS and the scientists of this institute persuaded the Minister to adopt a precautionary attitude in the face of the uncertainties about the risks due to low doses of radiation. Moreover, the Minister of Civil Protection took a leading role in co-ordinating and centralising information, something that in itself denotes a case of civil emergency.

As regards the social factors, the antinuclear movement was very active in organising demonstrations and debates on the risks of nuclear power and could rely on experts able to challenge the view of those governmental and non-governmental scientists who argued that there was no danger from the fallout in Italy. The mass media provided extensive coverage of the news on Chernobyl, thus rendering 'visible', through words and images, the invisible radioactivity. In this context, and because those most at risk were children, concerns over the possible consequences of the fallout were widespread among lay people. This was taken into consideration by politicians in need of legitimacy.

Federal Republic of Germany

In the FRG the first news on the Chernobyl accident also came on 29 April. In the afternoon, the Federal Minister of the Interior stated, after a meeting with the Radiation Protection Commission – Strahlenschutzkommission (SSK) – that there was no danger for the FRG because Chernobyl was far away. However, he asked the federal and state monitoring institutions to measure radioactivity concentrations. While monitoring was being undertaken, a highly politicised debate (extensively covered by the media) started on the consequences of Chernobyl. The most controversial issue was not so much the possible health and environmental consequences of the fallout, but the necessity and desirability of continuing or ending the production of nuclear power in the FRG. This debate – which was particularly heated also because of the nearness of elections – influenced the decisions on the countermeasures to be taken against the Chernobyl fallout and the different evaluations of the suitability of such measures.

On 2 May, the federal authorities decided, on the advice of the SSK, to control and limit the imports of certain foodstuffs from Eastern European countries, excluding the German Democratic Republic (DDR). Moreover, the SSK recommended a threshold of 500 Becquerel/litre of iodine 131 for milk. The setting of this and other thresholds did not prevent the authorities in the individual states from applying lower thresholds and implementing stricter measures in comparison with those decided at the Federal level.

These were the first signs of a problem that characterised the Chernobyl emergency in the FRG: the conflicts between the federal authorities and some state authorities in deciding about countermeasures, with the related differences in implementing federal provisions at the local level. This problem was only partially connected with the different levels of radioactive contamination detected in different areas. Political disagreements over the nuclear issue were much more important. In general, the states governed by the Christian Democratic Party (CDU), that is, the ruling party at the federal level, applied the recommendations issued by the federal government, while states governed by the Social Democratic Party (SPD) in several cases adopted stricter measures.

In an attempt to control this situation, the federal government asked the state governments on 8 May to implement the new SSK guideline that suggested maintaining a normal lifestyle and a normal diet. The reassuring statements of the government and the SSK were criticised by counter-experts and the Greens.

In the meantime, the federal government's information policy was heavily criticised by the SPD and the Greens for being incomplete as regarded the disclosure of data on the fallout and for being too reassuring about the 'absolute' safety of German nuclear plants. The SPD argued in favour of a moratorium and for a gradual abandonment of

the German nuclear programme, while the Greens suggested an immediate 'Ausstieg' (exit) and the antinuclear movement organised several demonstrations asking for the closure of all German plants. The Minister of the Interior and Chancellor Helmut Kohl (both members of CDU) defended the federal management of the Chernobyl emergency and the overall German nuclear policy.

On 4 June 1986, 40 days after the Chernobyl accident, the establishment was announced of a new Federal Ministry for Environment, Nature Protection and Nuclear Safety. This Ministry was given the task of dealing with the consequences of the Chernobyl fallout and with environmental problems in general. Thus, the worries and debates caused by Chernobyl produced, among other things, a new institution.

The German case presents some similarities and some differences with the Italian one. With regard to the way the problem was defined in the two contexts, the following points can be made. In both cases the fallout was regarded as a domestic as well as an external problem, to be dealt with by public authorities and in both cases health protection concerns were at the core of the definition of the problem and of the related measures decided upon by public authorities. These similarities can be attributed to the presence in both countries of scientific advisory institutions advocating precautionary action, as well as a strong antinuclear movement that asked for measures to be taken, and mass media coverage of the fallout contamination and of the debate on nuclear risks within the two countries.

A major difference between the Italian and German cases was over the definitions of the relation between the scale of the problem to be faced and the level of action to be taken. In Italy some contrasts emerged between central and local authorities, but the definition of the problem as a national emergency to be primarily tackled by national authorities was generally accepted. In the FRG, controversies over the proper level of action and responsibility characterised the management of the Chernobyl fallout, with the federal authorities emphasising the national dimension of the problems and the state authorities stressing the local differentiation of contamination and especially the states' responsibilities for dealing with nuclear emergencies. This difference between the German and Italian cases reflects the influence of different administrative systems (centralised vs federal) in shaping the framing of unexpected events.

Different social and institutional conditions caused a very different definition of the Chernobyl problem to prevail in France.

France

Chernobyl did not reach the French newspapers until 30 April. Side by side with the first news of the accident, the papers reported the opinion of some French experts who maintained that there was no risk of radioactive contamination in France. On 2 May an editorial in *Le Monde* commented on Soviet information policy and stressed the necessity for transparent information. Criticisms on the attitude to secrecy, regarded as a peculiarity of the Soviet system, were repeated during the days that followed by French authorities and journalists.

During the first week of May, the countermeasures decided upon in some Western European countries like Italy and the FRG were reported on. These measures were attributed by French commentators to panic and to pressure from the Greens.

Regarding the situation in France, the Central Laboratory for Food Hygiene asked its regional sections to 'double their level of attention' in analysing radioactivity levels in food, but no particular countermeasures were taken. The Central Service for Radiological Protection (SCPRI) centralised all the monitoring data.

In the meantime a less than heated debate on the safety of French nuclear plants began. The Greens (not represented in the Parliament), some environmental groups and the CFDT (trade unions linked to the Socialist Party) criticised the declarations made by the safety inspector of EDF (the state-owned nuclear industry), which claimed that accidents similar to that at Chernobyl could never happen in a French plant. But neither the ruling Socialist Party nor the opposition parties showed any doubt regarding the continuation of the French nuclear programme.

In a TV programme on 10 May, the director of SCPRI showed maps of the radioactivity levels in France between 30 April and 5 May. He declared that the radioactive fallout in France had been much weaker than the contamination detected in other European countries, thanks to favourable winds.

Over the following days, the information policy of the French authorities was harshly criticised by environmental groups and several journalists. The accusations previously addressed against the secretive attitudes of Soviet authorities were now levelled at the French ones. Furthermore, signs of widespread distrust in the public authorities started to appear; for example, sales of certain vegetables dropped sharply within a few days, even though no recommendations on this point had been issued by official sources.

Central authorities tried to remedy this situation. On 14 May, the Minister of Industry announced the establishment of an interministerial information structure on nuclear energy. He also decided to forbid the selling of spinach from Alsace. But this last measure raised even greater suspicions about the grounds on which precisely Alsatian spinach had been 'incriminated'.

News of minor accidents which had occurred in French nuclear plants in 1984 and May 1986 rekindled the debate on the French nuclear policy. However, only about 5000 people participated in an antinuclear demonstration in Paris on 24 May.

The most striking feature of the French case is the almost total lack of response, in terms of policy measures and social reactions, in comparison with the Italian and German cases. Evidence shows that this was not due to objective differences. Certain areas of France (Corsica, Var basin, Moselle valley) were as highly contaminated as certain areas in the neighbouring FRG and Italy. Different social and institutional factors favoured the construction of the problem as an 'external' one, and as a non-problem within French borders. These elements include the centralised structure of expertise and data gathering, the less precautionary attitude of French radiation protection authorities in comparison with the German and Italian ones, the relative weakness of the French antinuclear movement (which used to be one of the strongest in Europe in the 1970s) at the time of Chernobyl and the almost unquestioning acceptance of government statements by the French media for about two weeks. It should also be remembered that the nuclear industry provides about 80% of France's electricity. While this situation does not represent an explanation by itself (the German nuclear programme is also economically important), it did contribute to the shaping of the French response to Chernobyl.

Summary

As is clear from the different responses to the Chernobyl fallout, several social, institutional, economic and political factors shaped the framing of one and the same event as a different issue or non-issue in different contexts. It is worth pointing out that the uncertainties related to the risks due to low doses of radiation were differently perceived and used and this made an important difference with regard to the actual measures being taken. In Germany and Italy, influential actors emphasised these uncertainties and advocated the need for precautionary action. In France, the same uncertainties were either downplayed or used to criticise the adoption – on the basis of indecisive evidence – of countermeasures in neighbouring countries. Thus, the Chernobyl fallout proved to be a social construct as well as an actual dramatic event.

3.6 Conclusion

This chapter has discussed and illustrated the reasons why environmental problems should not be seen as given but as socially constructed. Some of the most influential conceptual instruments developed in the social sciences have been introduced and referred to in the context of specific examples.

We started by asking ourselves how something comes to be regarded as a problem, and why. In the discussion we stressed that the way an event is dealt with points to the social conditions that allow something to be seen as a problem at all. The definition of the nature of the problem is also socially constructed. The interface between science and policy has been focused on since it represents an important element in the social construction of environmental problems.

Important factors influencing the framing of environmental issues have been addressed, such as the features of the relevant institutions and political systems, the place of certain issues on policy agendas and priority lists, the communication patterns between different sectors of society, the economic interests at stake and the resources available in different social groups and countries.

A more detailed examination of political and economic factors shaping environmental problems and the formulation and implementation of their solution is provided in the following chapters.

* The views expressed are those of the author and do not necessarily represent those of the European Commission.