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"Report on the methodology for the implementation of the precautionary principle"

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NEEDS RS1b

Technical Paper T7.3
Report on the methodology for the implementation of the precautionary principle
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1. Introduction

Whereas the precautionary principle is valuable as a general guideline, the difficulty lies in its application to specific situations because there are no implementation rules that are sufficiently explicit. In fact, it would be problematic if not downright impossible to formulate specific implementation rules because each situation requires an analysis of the specific circumstances. In choosing between two actions A and B, one person may invoke the principle to justify A, while the other may feel just as strongly that B is to be preferred by the principle, the difference arising from different perceptions of the respective risks. For example, for the choice between nuclear and fossil fuels there is no generally accepted ranking of the risks associated with nuclear power on one hand and global warming on the other, and either technology could be preferred in the name of precaution. In such cases subjective judgment cannot be avoided.

Another difficulty lies in the need to evaluate the consequences of all relevant alternatives. In many cases a choice may decrease a risk that is evident but induces increased risks elsewhere, so-called countervailing risks that may be less visible but more important. Sometimes the statement “absence of proof of a harmful effect is no proof of absence” is cited to justify the prohibition of a substance in the name of precaution. Whereas this statement is true it is very misleading: absence of proof is in fact the only evidence for absence of an effect that we can ever find. For reasons such as these there is a serious danger of misusing the precautionary principle.

With these precautionary remarks we proceed to examine the possibilities of applying the principle to the estimation of external costs when there is a lack of sufficient information for a reliable estimate.

2. Arguing by Analogy

Perhaps the least problematic use of the precautionary principle is to argue by analogy when evaluating a risk that has similarities with another risk that has already been quantified. A good example is the estimation of the damage cost of Hg emissions. The most important impact is brain damage, especially to the fetus and infant. The impact is similar to that of Pb, but the dose-response function is not yet sufficiently well established for the quantification of the damage cost, by contrast to Pb for which the damage cost has been estimated [Spadaro and Rabl 2004]. In such a case it may be prudent to assume the same damage cost per kg of Hg as per kg of Pb.

Of course, the similarities may not be sufficiently close. For example, many pesticides are also neurotoxic but their chemical nature and environmental pathways are so different from Pb, that the use of the damage cost of Pb may be problematic. The greater the extrapolation in an argument by analogy, the more the result hinges on subjective judgment.

3. Attributes of Risks and Risk Aversion

Some impacts have attributes that can render the quantification problematic, especially a quantification in monetary terms. In particular, an irreversible impact is more serious than one that is reversible. Consider for example the destruction of a landscape under two scenarios: a) the damage lasts only a finite duration, b) the damage is permanent. According to standard economic practice the damage cost for the latter can be calculated from the former by the rules of discounting; for typical discount rates and durations it is not dramatically larger than the former. Yet people would feel that the permanent damage is much more serious.

There are several additional attributes that can affect the perception of a risk or damage in ways that are not captured by of damage cost calculation, as can be seen by asking the questions:
Is the damage limited to some region or is it global?
and
Could the largest possible damage be very much larger than the expectation value of the damage?
A global impact can be perceived as more serious than would be obtained by simple scaling of a regional impact with the same damage per area, just like the relation between an irreversible and a reversible impact. In cases where there is a probability distribution of damages and the maximum potential damage could be very large, the expectation value does not capture the full severity. Global warming provides a good illustration of these considerations: the extent is global, it cannot be reversed for many generations, and there is a small risk of fairly catastrophic damages.

In such cases the loss of utility can be a highly nonlinear function of the duration, geographic extent or magnitude of the damage, and the precautionary principle would say that one should take the damage cost to be much larger than the result of the standard linear methodology. Unfortunately here again the principle fails to offer concrete guidelines. The answer would be straightforward only for impacts that are unacceptable, for example the end of mankind, in which case the answer is simple: the damage cost is infinite and a choice with such consequences must be avoided. In reality most impacts are not totally unlimited in time or totally catastrophic. Even loss of species may be sufficiently reversible thanks to genetic engineering.

Unlike temporal or geographic extent and magnitude of potential damage, the aversion to risks that appear especially frightening may not be an appropriate criterion for increasing a damage cost estimate. Whereas the former attributes render the utility function nonlinear, risk aversion affects the subjective perception even if objectively the utility function remains linear. For example, the health impacts of certain chemical pollutants, in particular dioxins, received so much media attention during the eighties and nineties that they were dreaded far beyond their real magnitude. A policy based on risk aversion would forbid waste incinerators because of their dioxin emissions, i.e. it would in effect set the damage cost at a prohibitively high level. But would that be rational if, as is the case now, these emissions have been reduced to the point where the impacts are no longer significant?

4. Implementation in decisions

Because of the subjective judgment in any application of the precautionary principle, if it has been used during the analysis, that must be pointed out when presenting the results in order to

allow critical examination by other analysts and by decision makers. Ultimately the application of the principle is the responsibility of the decision makers after analysts have provided all the relevant information. For example, in the event that a cost-benefit analysis indicates that a particular policy should not be pursued (i.e. that costs > benefits), decision makers may choose to disagree on the grounds that the analysis is not complete and effects that have escaped quantification are potentially serious enough to justify taking it forward. Alternatively, in a case where a policy passes a cost-benefit test, decision makers may choose not to adopt it because of concerns about unquantified but probably negative impacts.

Whilst the burden of application of the precautionary principle should fall on those appointed or elected to make decisions, analysts at all levels need to be aware of the need to provide sufficient detail of the quality of their analysis and any doubts that they may have about it. Without this, the ultimate decision makers may have a very skewed impression of the issues relevant to a precautionary stance.

References

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