



What are the core ideas behind the Precautionary Principle?



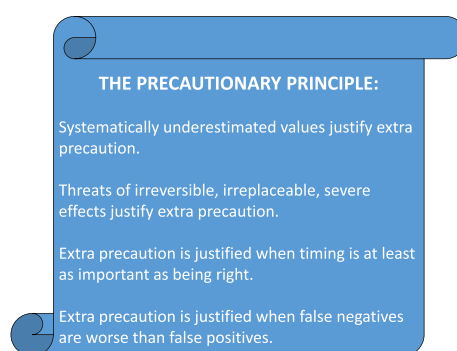
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HIGHLIGHTS

- Identification of the core ideas of the Precautionary Principle.
- Systematically underestimated values justify extra precaution.
- Threats of irreversible, irreplaceable, severe effects justifies extra precaution.
- Extra precaution is justified when timing is at least as important as being right.
- Extra precaution is justified when false negatives are worse than false positives.

GRAPHICAL ABSTRACT



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ABSTRACT

The Precautionary Principle is both celebrated and criticized. It has become an important principle for decision making, but it is also subject to criticism. One problem that is often pointed out with the principle is that is not clear what it actually says and how to use it. I have taken on this problem by performing an analysis of some of the most influential formulations of the principle in an attempt to identify the core ideas behind it, with the purpose of producing a formulation of the principle that is clear and practically applicable.

It was found that what is called the Precautionary Principle is not a principle that tells us what do to achieve extra precaution or how to handle situations when extra precaution is called for. Instead, it was found to be a list of circumstances that each justify extra precaution. An analysis of some of the most common and influential formulations of the Precautionary Principle identified four such circumstances: (1) When we deal with important values that tend to be systematically downplayed by traditional decision methods – such as human health and the environment. (2) When we suspect that the decision might lead to irreversible and severe consequences and the values at stake are also irreplaceable, (3) When timing is at least as important as being right. (4) When it is more important to avoid false negatives than false positives.

This interpretation of the Precautionary Principle does not say anything about what kind of actions to take when extra precaution is called for, but it does provide a clear and practically useful list of circumstances that call for extra precaution and that is not subject to the most common objections to the Precautionary Principle.

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1. Introduction

The *Precautionary Principle* has become an important tool for decision making. This principle is recommended or even prescribed by many official sources. These include international declarations

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and treaties such as the Rio declaration, Agenda 21 and the constitution of the European Union, and also national as well as regional and local legislation in many countries (Ambrus, 2012; Beltrán, 2001; Commonwealth Consolidated Acts, 1999; Cooney and Dickson, 2005; Gignon et al., 2013; Gollier and Treich, 2003; Grandjean, 2004; Grandjean et al., 2004; Herremoës et al., 2001; Lin, 2001; Melin, 2001; O’Riordan and Jordan, 1995; Osimani, 2013; Purnhagen, 2014; Rio Declaration, 1992; Raffensperger and Tickner, 1999; Sandin, 2004a, 2004b; Steel, 2015; Turner and Hartzell, 2004; Walsh, 2004; Whiteside, 2006). It has, however also been criticized from a variety of sources and it remains controversial (Cooney and Dickson, 2005; Gignon et al., 2013; Gollier and Treich, 2003; Grandjean, 2004; Grandjean et al., 2004; Hermele, 1995; Munthe, 1997; O’Riordan and Jordan, 1995; Osimani, 2013; Sandin, 1999, 2004b; Sandin et al., 2002; Steel, 2015; Turner and Hartzell, 2004; Whiteside, 2006). The problem that is most commonly raised is that the principle is unclear (Ambrus, 2012; Gollier and Treich, 2003; Graham, 2001a, 2001b; Manson, 2002; Mayer et al., 2002; Osimani, 2013; O’Riordan and Jordan, 1995; Purnhagen, 2014; Sandin, 1999; Sandin, 2004a; Sandin et al., 2002; Steel, 2015; Turner and Hartzell, 2004; Whiteside, 2006). In order to deal with that problem, I will here present a more “tidy” and transparent version of the Precautionary Principle with defined boundaries for its applicability. This version of the principle was derived from an analysis of the most common formulations of the Precautionary Principle, with the aim of identifying the most basic ideas behind the principle.

The analysis revealed that the basic ideas behind the Precautionary Principle contrary to popular belief, has nothing to do with where to place the onus of proof, how certain we need to be that a new invention is safe before we give green light to use, or how to prioritize between different risks. Instead, the basic ideas behind the Precautionary Principle was shown to deal exclusively with which circumstances that justify extra precaution beyond what would be called for by other decision procedures. I therefore suggest that the Precautionary Principle should be interpreted as a list of criteria for when we need extra precaution, not as a principle telling us what to do when we think (for some reason) that we need extra precaution. It tells us, in other words, when we need extra safety and why, not what to do in these situations. This does not mean that the Precautionary Principle is useless as a decision principle. Pinpointing in which situations we need extra safety, and why this is justified is extremely important. Although the formulation presented here is more limited, it is also clearer and more easy to use, which makes it more, not less, useful in practice than previous formulations.

2. What does the Precautionary Principle really tell us?

There are many different formulations of the Precautionary Principle. The most commonly quoted formulation is from the Rio Declaration (Referred to among others by Ambrus, 2012; Cooney, 2005; Gollier and Treich, 2003; Grandjean, 2004; Lin, 2001; Manson, 2002; Melin, 2001; Osimani, 2013; Sandin, 1999, 2004a, 2006; Sandin et al., 2002; Stijkel and Reijnders, 1999; Walsh, 2004; Whiteside, 2006):

Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

[Rio Declaration (1992)]

The Rio declaration in general leaves much room for interpretation, and the Precautionary Principle is no exception. There is a large flora of interpretations, and there is still no real consensus (Cooney and Dickson, 2005; Sandin, 1999, 2004a). The Rio formulation has also been criticized for being too weak, and for not really telling us what to do, but only what not to do (i.e. not to use lack of scientific certainty as an excuse for not acting) (Sandin, 2006). It is true that the Rio formulation does not actually tell us what to do but it does provide something

else. It points out two situations that differ from “normal” decision situations and therefore need to be treated differently. The situations that are pointed out are situations where there is a serious threat and situations where there is a risk for irreversible damage. What constitutes a serious threat is still unclear, however.

There are other competing formulations of the Precautionary Principle and they too are intensely debated (Cooney and Dickson, 2005). One formulation that is often referred to is the so-called Wingspread formulation (Grandjean, 2004; Osimani, 2013; Sandin, 1999, 2004b, 2006; Turner and Hartzell, 2004; Whiteside, 2006). It was formulated six years after the Rio formulation at a conference with a number of scientists, activists, etc. from different countries (though mostly from North America). It states the principle as follows:

When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically.

[Wingspread Conference (1998)]

Contrary to the Rio formulation, the Wingspread formulation is stated as a positive prescription. In practice this does not make much of a difference, however, since it does not tell us what kinds of measures we should take, other than that they should be precautionary. Like the Rio formulation, it concentrates on telling us which situations call for extra precaution. Here, it is somewhat more specific than the Rio formulation, however. It also includes human health among the relevant considerations. This was not mentioned by the Rio formulation.

Also other formulations seem to point in about the same direction even though they differ in the details (Gollier and Treich, 2003). Grandjean et al. (2004) interpret the Precautionary Principle as:

... a tool for avoiding possible future harm associated with suspected, but not conclusive, environmental risks.

Just like the Rio formulation and the Wingspread formulation, Grandjean et al. abstain from providing any advice on what to actually do to avoid possible future harm, not to mention a tool for doing so. Just like the two previously mentioned formulations, it instead provides us with criteria for when to take such measures. In this case, the criteria is that we stand before suspected but not conclusive future harm that is associated with environmental risk. Exactly what degree of suspicion is called for is not specified, however.

Per Sandin defines the core idea of the Precautionary Principle as follows:

... on some occasions, measures against a possible hazard should be taken even if the available evidence does not suffice to treat the existence of that hazard as a scientifically established fact (Sandin, 2004a, similarly stated in Sandin et al., 2002 and Sandin, 2004b).

Just like the others, Sandin does not specify which measures to take but he does give us a clue for under which conditions such measures are called for, namely when we face a possible hazard that is not scientifically established.

Whiteside presents an interpretation that is a bit more elaborate than the others, but the basic ideas seem to be the same:

... the precautionary idea in risk regulation is at work whenever authorities take early preventive measures to forestall a potential, irreversible danger, even though causal links in the chain leading to that danger have not yet been firmly scientifically established.

[Whiteside (2006)]

Again, nothing is said about which measures to take but it is indicated in which types of situations they are motivated. In this

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