Ecological wisdom as a guide for implementing the precautionary principle

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Abstract

Many governments around the world have used the precautionary principle as the foundation in developing public policies since the late twentieth century. The principle stipulates that governments shall be obligated to restrict or ban activities that may cause serious and/or irreversible harm to human health and the environment, even without fully established scientific evidence of causal relationship. Further, the proposers of the activities must demonstrate that those activities will not cause serious harm. The precautionary principle has received criticisms, and these range from ignoring the benefits from proposed activities or overlooking the harm from inaction, having bias toward nature, to imposing an impossible burden of proof on the action proposers. Some of the debates have revealed the misuse of the principle and the need for clarification and specification. Other differences of opinion can be attributed to the uncertainties of the future since neither the proponents nor the opponents of the principle can be certain about the outcome of a proposed action. Therefore, socio-ecological practitioners need more knowledge implementation and impact research to produce actionable guidance on implementing the precautionary principle for sustaining human settlements. The recent progress of ecological wisdom has the potential to provide a fresh perspective for applying the precautionary principle. After describing ecological wisdom, this essay demands that pursuing benefits and avoiding problems are everyone's responsibility. All involved stakeholders have the same moral obligation to internalize knowledge, experience, and ethical values in decision-makings that affect humans and the environment they rely on.

Keywords Precautionary principle · Uncertainty · Decision-making · Ecological wisdom · Human health · Environment · Socio-ecological practice

1 Introduction

This Socio-Ecological Practice Research (SEPR) journal promotes knowledge generation and implementation in socio-ecological practice that represents one or any combination of activities of planning, design, construction, restoration, and management of human settlements and their support systems (Xiang 2018, p. 1). Those activities aim at sustaining and improving the complex socio-ecological system through different forms of change such as fine-tuning and modifying existing practices or formulating new practices. Although practitioners develop changes with good

intention, consequences of changes are inherently not always predictable due to the dynamic and uncertain reactions of system components. History shows that urbanization, an example of changes introduced by humans, has led to jobs and prosperity while at the same time induced poverty and environmental degradation that threaten human life and health as well as the urban environment.

In response to the increased disruptions from climate change and social, ecological, and economic breakdowns, scholars and policy makers have paid attention to the socio-ecological transitions that promote systems thinking of the interactions between social and environmental dimensions for sustainable future (Schatzenstaller et al. 2014, p. 377; Sanneh 2018, p. 8). One such example is developing public policies based on the precautionary principle. According to the precautionary principle, governments are obligated to restrict or ban activities that may cause serious and/or irreversible harm to human health and environment, even

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without fully established scientific evidence of causal relationship. Further, the precautionary principle claims that it is the responsibility of the proposers to demonstrate the safety of the activities (Burnett 2009, p. 383). The precautionary principle is relevant to the SEPR readers because it serves as a guiding principle for decision-makings in socio-ecological practice. The intent of the precautionary principle is to provide a foundation for governments to formulate policies regulating human activities with the potential to threaten human health and the environment. It represents a shift from reactive and problem-solving-based policies to proactive and preventive policies.

While the precautionary principle has gained recognitions from governments and international organizations around the world, debates about the principle and its implementation in decision-makings have persisted since its inception (Foster 2002, p. 10; Sandin et al. 2002, p. 289; Bratton 2003, p. 254; Feintuck 2005, p. 378; Peterson 2006, p. 595; Saunders 2017, p. 47). SEPR readers may find the debates about the precautionary principle interesting because of the differences are more on applicability and consequences of implementation than on the principle itself. While some problems could be attributed to the misuse of the principle or require further clarifications, other problems are related to the uncertain outcomes. The fact that neither proponents nor opponents of the precautionary principle are able to persuade the other side shows that socio-ecological practitioners need actionable guidance for implementing the precautionary principle to sustain human settlements under uncertainty. To resolve the issue, more knowledge implementation and impact research (knowledge I&I research) are needed. After reviewing the precautionary principle and its implementation, the paper introduces ecological wisdom and explains why and how ecological wisdom may serve as the guide for better implementation of the precautionary principle.

2 The precautionary principle and its implementation

Precautionary approaches have had a longstanding presence in human history, reflected in proverbs such as “better safe than sorry” and “an ounce of prevention is worth a pound of cure.” Harremoës et al. (2002, p. 7) give an example of controlling cholera outbreak by closing a water pump in London in 1854. At that time, the death toll from cholera was high, and Dr. John Snow had conducted studies that linked cholera to water supplies. While scientifically proven causal relationship was not available, the policy makers in London decided to close the suspected water pump and, consequently, prevented further cholera infection.

Environmental catastrophes related to human activities (Bratton 2003, p. 253) and the recognition of the lack of scientific certainty have led to the rise of the precautionary principle in contemporary public policy development. Literature shows that precaution was first used as an action principle in German environmental policies in the late 1970s in order to detect dangers early, to avoid damages, especially those caused by humans, and to promote consideration of the future (Harremoës et al. 2002, p. 4; Feintuck 2005, p. 374; Gardiner 2006, pp. 34–35; Burnett 2009, p. 379; Peterson 2017a, p. 112). The core of the precautionary principle is that when the threat of irreversibility is anticipated, actions should be taken before full scientific understanding is available (Boehmer-Christiansen 1994, p. 37; Sandin et al. 2002, p. 288; Burnett 2009, p. 380).

Since the 1970s, different versions of the precautionary principle have been included in international agreements such as the 1985 Vienna Convention for the Protection of the Ozone Layer (UN 1985), the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer (UN 1987), and national laws in various countries (Resnik 2003, p. 330; Kramer et al. 2017, pp. 32–33). The 1990 Bergen Declaration of European Ministers links the precautionary principle to policies for achieving sustainable development. According to the declaration, environmental measures must anticipate, prevent, and attack the causes of environmental degradation. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation (Wickson 2005, p. 122). The 1992 report from the United Nations Conference on Environment and Development in Rio de Janeiro, Brazil is among the early efforts to promote precautionary and anticipatory measures rather than reactive approaches by an international organization (UN 1992). The purpose of the Rio Earth Summit is to reduce the risk of long-term or irreversible adverse effects upon the environment by preventing marine environment degradation, addressing the environmental, social and economic impacts of climate change and sea level rise, and managing water quality and waste disposal. In reference to the role and use of science, the document states, similar to the Bergen Declaration, that “In the face of threats of irreversible environmental damage, lack of full scientific understanding should not be an excuse for postponing actions which are justified in their own right. The precautionary approach could provide a basis for policies relating to complex systems that are not yet fully understood and whose consequences of disturbances cannot yet be predicted” (UN 1992, p. 35.1).

Another influential development of the precautionary principle was the 1998 Wingspread Conference on the Precautionary Principle. At the end of the conference, more than 30 scientists, philosophers, lawyers, policy makers and environmental activists issued the Wingspread Consensus

Statement on the Precautionary Principle: “When an activity raises threats of harm to human health or to the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. In this context, the proponent of an activity, rather than the public, should bear the burden of proof. The process of applying the Precautionary Principle must be open, informed, and democratic and must include potentially affected parties. It must also involve an examination of the full range of alternatives, including no action” (SEHN 1998, p. 1). Two points the Wingspread declaration emphasized are about who bears the burden of proof and the consideration of no action as an alternative.

The European Commission’s communication on the Precautionary Principle in 2000 provides guidance on implementing the precautionary principle. The document further stresses that decision makers have the duty to make determinations in deciding unacceptable risk, accepting scientific uncertainty and understanding public concerns (CEC 2000, p. 3).

The precautionary principle has been applied in decision-makings in many fields, including but not limited to medicine, public health (safety of donor blood), biotechnology (genetically modified crops), food safety, climate change, species extinction, homeland security, environmental management, chemical regulation, nuclear power, marine and fisheries protection, conservation of the natural environment and biodiversity, and protection of ozone layer (Cameron and Abouchar 1991, p. 13; Stebbing 1992, p. 13; Foster et al. 2000, p. 979; Levidow 2001, p. 842; Hahn and Sunstein 2005, p. 2; Peterson 2006, p. 595; Peterson 2007, p. 5; Cousins et al. 2016, p. 334; Kramer et al. 2017, p. 33). The precautionary principle elevates the importance of prevention in decision-makings. It takes a critical view of the relationship between humans and the environment and institutionalizes caution and responsibility of human-induced harm. It broadens the narrow view of development as economic growth and provides an important approach to address the flaws in risk assessment and cost–benefit analysis in the face of uncertainty (Gardiner 2006, p. 35).

In spite of the increasing acceptance by government and international organizations, the precautionary principle has also received a great deal of criticism. Some reveal the improper application of the principle. For example, one criticism is that the precautionary principle ignores both the potential benefits from an action and the harms that might result from inaction (Gardiner 2006, p. 37; Sunstein 2003, p. 1017). Burnett (2009, p. 395) uses an example of genetically engineered “Super Rice” to show that both approving or banning its development could result in famine and starvation. Therefore, the catastrophe argument must be applied to the banning and allowing of super rice. As shown above, the Wingspread declaration clearly demands the assessment of

no action, which should be sufficient to consider the danger associated with banning a proposed action. It is important that the no action option is considered in practice.

Burnett (2009, p. 393) cites a study showing that 99.9% of the chemicals a person ingests are natural and many of them are rodent carcinogens. Therefore, banning of new chemicals (such as pesticides) is an example of another suggested drawback of the precautionary principle: the bias the principle has toward nature. This argument assesses the principle outside its applicable domain. The precautionary principle is to guide decision-makings about a proposed human action, not to protect humans from non-human-induced danger.

Others believe that the principle is “unrealistically intolerant of risks and therefore requires unreasonable sacrifices in the name of safety” (Kramer et al. 2017, p. 33). These opponents claim that the precautionary principle prohibits any action that might be dangerous. Sandin et al. (2002, p. 291) suggest developing a required degree of scientific evidence in operating the precautionary principle or to set a threshold level for applying the precautionary principle. In response to the criticism that the precautionary principle is poorly defined and there are too many different versions of the principle, Sandin et al. (2002, pp. 289–290) propose four specifications in order to make the principle operational: the types of hazards, the level of evidence, the types of measures against potential hazards, and the forces recommended.

Some debates are around problems of justification, scope, interpretation, and definition, such as the consistency or coherence of the precautionary principle (Peel 2005, p. 2; Peterson 2006, p. 595; Boyer-Kassem 2017, p. 2027; Saunders 2017, p. 47). They can be attributed to uncertainties of the future since neither the proponents nor the opponents could be certain about the outcomes of a proposed action. It is reasonable to say that any disaster, including natural disasters, is always undesirable since it threatens the existence of human beings and the socio-ecological system they rely on. Meanwhile, no one can really plan for such crises even though each crisis is the result of one or more changes initiated by humans in the past (Lee 2016, p. 5). Any change has associated risk because a small change may lead to larger changes that may, in turn, lead to a disaster. The challenge is that we are constantly making changes without a full understanding of the consequences. Therefore, we are obligated to avoid problems while maximizing benefits when we implement changes.

In practice, it is often easier to find and solve problems after they arise than anticipate and avoid problems (Wynne 1992, pp. 111–112). This can be explained with the variable level of knowledge about outcomes of a proposed action that requires different guiding principles (Stirling and Gee 2002, p. 117)—certainty, risk, uncertainty, ambiguity, and ignorance. At one end of the spectrum is the case of “certainty” when rigorous scientific studies precisely predict the

outcomes of a proposed action. Decision makers can reach a preferable decision by following a set of rules. Although this may still be a challenging task because the outcomes affect stakeholders differently and stakeholders have different preferences and priorities, there are many principles available, such as the cost–benefit principle, the sustainability principle, the autonomy principle, or the fairness principle (Peterson 2017a, p. 168), to guide the practices of reaching a set of rules through a collaborative process. When we consider the incommensurability of benefits and costs and their distribution among different cohorts of people, the difficulty of making a right decision could be even greater. Aldred (2013, p. 133) provides more in-depth discussions on incommensurability.

In the case of “risk” when rigorous scientific studies can determine the probability distribution of possible outcomes from a proposed action, decision makers approve or reject a proposed action based on the level of acceptable risk and risk management principles. The approved action is often associated with risk mitigation plans and contingency plans to avoid or minimize the negative impact. There are many studies in the field of risk analysis and risk management (e.g., Resnik 2003; Wickson 2005; Aldred 2013; Todt and Luján 2014).

“Uncertainty” is a case under which we may know the nature of potential outcomes but do not know their associated probabilities. “Ambiguity” is a case when people do not know enough to agree on the nature of outcomes and/or their associated probabilities (Stirling 2007, p. 524; Wickson 2005, p. 119). Different social values, cultural beliefs, economic status, experiences, and many other features that influence our ability to perceive and understand outcomes, to calculate the associated risks, and to share the costs and benefits, can further complicate the decision-making process (Wickson 2005, p. 116). The principles available to decision makers under certainty and risk situations are no longer effective under uncertainty or ambiguity. Some of the relevant principles are “maximin” or “no regret” principles (Aldred 2013, p. 133), as well as the precautionary principle (Resnik 2003, p. 335; Stirling 2007, p. 312).

At the end of the most uncertain spectrum is the case of “ignorance” when we are unable to conceptualize and characterize all potential outcomes (Wynne 1992, p. 114; Stirling and Gee 2002, p. 524; Resnik 2003, p. 332). One example is that the occurrence of some outcomes is dependent on the contingent behavior of people involved (Feintuck 2005, p. 390). Principles such as adaptation and resilience can help decision makers to recognize and accept the reality of ignorance and prepare for the surprises (Rivera-Ferre and Ortega-Cerdà 2011, p. 394). The precautionary principle is also proposed to provide guidance for decision-making by giving the benefit of the doubt to the protection of human health and environment (Stirling 2007, p. 314).

In the face of uncertainty, critics challenge whether the precautionary principle is a better choice (Burnett 2009, p. 407) and protest that the principle marginalizes science in decisions, stifles scientific-technological innovation and imposes an impossible burden of proof on the action proposers (Sandin et al. 2002, p. 295; Bratton 2003, p. 254; Todt and Luján 2014, p. 2163). The supporters proclaim that the precautionary principle provides the necessary guidance when scientific data are insufficient and promotes scientific discoveries to reduce uncertainty (Sandin et al. 2002, p. 296). Resolving the debate requires both sides finding a common ground to assess the principle and its context-specific implementation (Peel 2005, p. 28). The recent progress of ecological wisdom has the potential of providing a fresh perspective.

3 Ecological wisdom

In the context of socio-ecological practice, wisdom refers to one’s ability to think (*sophia*) and act (*phronesis*) on solving problems of the complex socio-ecological system (Xiang 2016, p. 55). “To think” means that an individual or a group of individuals are able and willing to select and integrate relevant principles based on experience, understanding, knowledge, insight, and common sense (Gugerell and Riffert 2011, p. 227). “To act” means that this individual or a group of individuals are able and willing to apply the principles in problem-solving actions. In addition, wisdom also requires an ability to justify the reasons for their beliefs to gain support from others. Wisdom is built upon a foundation supported by science, experience, and ethics (Fan 2008, p. 18; Fu et al. 2016, p. 80) and includes personal cognitive, reflective, and affective qualities (Ardelt 2004, p. 274).

Ecological wisdom is a special case of wisdom that pays particular attention to integrating ecological knowledge with site-specific knowledge in socio-ecological practices aiming at harmonious coexistence between humans and the environment (Fu et al. 2016, p. 80; Wang et al. 2016, p. 105). Guided by ecological wisdom, our actions must follow the laws that regulate nature, a philosophical idea promoted in Taoism (Daszak et al. 2008, p. 235). Since all scientific findings reflect the understanding of nature, ecological wisdom requires us to be able to identify the relevant findings in addressing a particular problem in socio-ecological practice. Because we do not have scientific understanding of everything that happens we must be able to integrate scientific knowledge with experience that reflects the relationship we observe but cannot yet explain. What obligates us to do so is the ethical values that consist of three responsibilities. First, species responsibility compels us to act with the goal of contributing to real and permanent good (Xiang 2016, p. 58) to the

ecosystem which we live in. Second, generation responsibility defines the real and permanent good as avoiding hurt to the current and future generations. While recognizing the difficulties from many problems previous generations left us, such as chemical pollutions and traffic congestions, we must act not to increase the threat to human health and the environment. Finally, competence responsibility calls for those who take actions (i.e., those who develop new technologies, who develop new policies, and who apply the technologies and policies) to appreciate and respect nature (Beatley and Newman 2013, p. 3329) and convey such messages to the public. For more detailed discussions on ecological wisdom, see Dubos (1973), Xiang (2016), Wang et al. (2016) and Wang (2017).

According to the anthropocentric view, human values are the most important component in deciding what to do. The non-human components only have service value to humans. The ecocentric view is at the other end of the spectrum, stating that humans are just one of many species and do not have more rights to do things than other species. There are variations of views between the two, which are labeled as weak anthropocentric views or shallow ecologic views (Epting 2017, p. 132; Næss 1973, p. 7). Anthropocentric and ecocentric views are opposite to each other around the premise that there are values of humans and values of non-humans, such as human's interests and the integrity of ecosystem (Curry 2006, pp. 54–60). Therefore, the debate is centered on which group of values are more important than the other group. The dichotomous perspective leads to approaches aiming at trade-offs, balancing, and compromises (Wang et al. 2016, p. 103).

Ecological wisdom calls for the integration of both anthropocentric and ecocentric ethical perspectives. Ecological wisdom represents a philosophical idea derived from rethinking the relationship between humans and the environment as the relationship between components of the same ecosystem. There should not be competition of intrinsic values and utilitarian values of the environment. The stewardship approach to achieve the human–environment harmony is to link human desires to ecological integrity and recognize human impact on the environment. Efforts should not be spent to find the center of the socio-ecological system. Ecological wisdom inspired socio-ecological practice, then, is a process of searching and pursuing the right way to do the right thing (Schwartz and Sharpe 2010, p. 5; Xiang 2014, p. 67) with the recognition of the limits of human knowledge. In this context, the right thing is the responsibility of protecting the integrity of the earth system that humans rely on. Wisdom arises from observing the outcomes of actions. The debate about the implementation of the precautionary principle lends itself to the contribution of ecological wisdom.

4 Ecological wisdom as a guide for implementing the precautionary principle

Although various organizations have provided many different definitions, the core of the precautionary principle in those definitions appears to converge around four conditions for applying the precautionary principle. (1) Threat: there should be scientific evidence of serious and irreversible threat to human life and health or harm to the environment (Gardiner 2006, p. 36), (2) Uncertainty: the impact and causality are not fully established scientifically (Gardiner 2006, p. 36; Aldred 2013, p. 133), (3) Responsibility: the agents who propose the action bear the burden of proof that the action is safe (SEHN 1998, p. 1), and (4) Decision: the authority agencies must make a decision on the proposed action (CEC 2000, p. 3).

Saunders (2017, p. 47) makes an analogy of debates on the precautionary principle to debates in criminal courts. Because courts do make mistakes and it is worse to convict an innocent person than to acquit a guilty one, the prosecutor has the burden of proof that the defendant is guilty. The proposer of an action in the precautionary principle debates plays a similar role as the prosecutor in court, and therefore should bear the burden of proof that the action is safe. This process is based on the belief that there is always the possibility of making a wrong decision to ban or not to ban an action. It is worse to execute an action that may cause serious and irreversible impact than to prohibit a safe action. This analogy clearly shows the flaw in the precautionary principle opponent's argument that the principle is invalid because the adverse effect of banning the action could be greater than taking the action. Likewise, there is a flaw in the precautionary principle's supporters' perspective that decisions based on the principle are always correct. No one proposes to throw away the criminal court because the court makes mistakes and we would not defend the criminal court by claiming court decisions are always correct. Similar to how different judges might make different decisions while applying the same principles, a decision-maker's attitude plays an important role in determining a preferred decision based on the precautionary principle (Miller and Engemann 2018, p. 20).

From this criminal court analogy, we also learn that both sides of the debate accept that the two parties involved in a proposed action pursue two separate goals. The goal of the action proposer is to take the action with the argument that the action will provide benefits to people. The goal of the government is to ban the action with the argument that the action posts threat of serious and irreversible impact on people or the environment. This separation of goals is a problem itself. The action proposers should

not only pursue the benefits of the action without assessing its threat. The decision of applying the precautionary principle should be taken at the level of a society and be a rational action justified on the basis of ethical and socio-political grounds (Saunders 2017, p. 47). The implementation of the precautionary principle is political (Whiteside 2006, p. 151), and it is everyone's responsibility to find the grounds of consensus in pursuing benefits and avoiding problems in the global context.

When we take a closer look at the debates related to the precautionary principle, we see that many of the debates simply reflect different interpretations of threat, uncertainty, responsibility, and decision. When the proponents consider a threat serious enough for taking the precautionary approach, the opponents argue that the threat is within tolerable range of risk. In another example, Peterson (2006, p. 595, 2017b, p. 2037) contends that the precautionary principle is not a reasonable rule for rational decision-making because it does not satisfy some well-established decision desiderata and Boyer-Kassem (2017, p. 2033) challenges Peterson's justifications. They argue theoretically and cannot convince each other. The reality is that in practice under uncertainty, the meaning of "fatal outcome" considered in making decisions is the responsibility of decision makers. The fact that different people implement the precautionary principle differently is not an indication of the problem of the principle. Because the impact and causality are not fully established, we cannot expect everyone reaches same decision under uncertainty.

Ecological wisdom has the potential of providing a fresh perspective for applying the precautionary principle. Everyone has the moral obligation to internalize ecological knowledge in decision-makings that affect human health and the environment. Separating benefit maximization and problem minimization is not a holistic approach to reach any decisions. Pursuing different goals will most likely reach decisions that are different or incompatible with one another. However, everyone should realize that we all live on the same planet and will have to face the consequence of our action together, regardless the position toward the action. The Earth formed more than 4.5 billion years ago. Compared to her history, human history is only about 200 thousands years. The Earth can sustain without humans while humans depend on the earth. What keeps this planet livable for humans is its ecological, social, economic, and cultural diversity, as well as the dynamic interactions among organic and inorganic components. The threat to human health and the environment is then the threat to the survival of human species. Therefore, avoiding such threat should be the purpose of "doing the right thing in right way".

Built upon ecological wisdom, the debate about the precautionary principle can be geared toward collaboration rather than finger pointing. The literature shows that the precautionary principle proponents and opponents all

agree with the value of precaution. The differences are in the implementation of the precautionary principle. Opponents do not suggest ignoring the threat of a proposed action to human health and environment. They challenge that decisions based on the precautionary principle fail to provide sufficient rationales that the threat is real, that the tolerance level of the risk is appropriate, or that the cost-benefit analysis is favorable for banning the proposed action. Opponents guided by ecological wisdom would accept that the reason for applying the precautionary principle in the first place is the uncertain consequences of the proposed action. Facing uncertainty, action proposers have the same responsibilities as action approvers to assure that the proposed action would not harm human health and the environment. The criticism that the precautionary principle discourages scientific-technological innovation can only be true if the new technology proposers withdraw from further scientific-technological investigation. However, this would not happen in ecological wisdom guided practice. Those who propose new technologies will take on the responsibility of protecting the human settlement voluntarily and will not consider scientific investigation of "doing no harm" as a burden.

Another critic of the precautionary principle is the misuse of the principle, such as using it as an ad hoc political response to public controversy (Foster 2002, p. 13). In this regard, the precautionary principle should not be blamed. The problem is in the implementation of the principle. All principles, including the precautionary principle, are subject to misuse. This shows the importance of doing the right thing in right way. Ecological wisdom requires government officials and all involved stakeholders integrate scientific knowledge, local knowledge, experience, and ethical values in their decision-making, which includes using the precautionary principle and other principles appropriately.

5 Conclusions

This inaugural issue focuses on the overarching theme of socio-ecological practice research: from practice, for practice, and beyond practice (Xiang 2018, p. 4). The debates around the precautionary principle demand more such research. Rigorous scientific methods are appropriate for cases of certainty when the outcomes of a proposed action are known and cases of risk when the probability distribution of possible outcomes from a proposed action is known. Decision-making under uncertainty, ambiguity, and ignorance is a type of problems that are too complex to expect a single robust set of scientific findings (Stirling 2007, p. 312) and "messy and confusing and incapable of technical solution" (Schön 2001, p. 191). These problems are often wicked (Xiang 2017, p. 2242) and at the same time, very important to the socio-ecological system in which human beings live.

Consequently, policy makers turn to the precautionary principle for guidance when they have to make decisions before researchers can fully anticipate the outcomes of proposed actions.

While the precautionary principle has been widely adopted by various governments and international organizations, it is always associated with debates about its value in decision-making. The review of the debates in this paper reveals that the core of difference is not on the value the precautionary principle stands for. Rather, people debate the implementation of the precautionary principle—whether it can provide specific guidance to decision makers, whether it can provide scientifically robust and consistent results, or whether it halts the advancement of science and technology. More than two decades ago, O’Riordan and Cameron (1994, p. 293) pointed out that “humanism and capitalism need not work at cross purposes” and we need guides for the practice of precaution to evolve. This is still true now. This article proposes that ecological wisdom can provide a necessary and competent guide for implementing the precautionary principle. As more real-world cases of decision-making under uncertainty in socio-ecological practice are well researched and become readily available, we should be able to assess the efficacy and impact of this ecological wisdom guided implementation of the precautionary principle.

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