

Internalising Traditional Ecological Knowledge in the Application of Precautionary Principle in Natural Resource Management*

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Abstract

The precautionary principle remains one of the most contentious principles in international environmental law. The very fact that it is a principle of international environmental law has been questioned by many legal scholars, however does not take away the fact that the precautionary principle continues to be applied widely across sectors both internationally and nationally. The nature and scope of its application has varied widely according to the context and sector within which it has been applied. Within the field of natural resources management (and more specifically for the purpose of conservation and protection of biological diversity), the application of the principle has been far more implicit than others. Extraordinarily the early application of the precautionary principle was far more widespread in the natural resources sector than in the others. It is however only now that studies have brought into fore the equity and social impacts of its application which in turn have called into question the successful implementation of the entire project i.e. the application of the precautionary principle in natural resource management. A possible remedy would be to internalise traditional ecological knowledge within the decision-making structure underlying the application of the precautionary approach within this sector. This would have a positive impact on equity and access to justice in terms of lowering

costs of collection of evidence and facilitating a consultative framework for stakeholder participation within the decisionmaking structure.

Part I: Introduction

There is yet to be consensus amongst the international legal community on the meaning, rules of implementation and methodology of application of the precautionary principle.¹ Quite simply, precautionary principle ensures that a substance or activity posing a threat to the environment is prevented from adversely affecting the environment, even if there is no scientific or conclusive proof establishing a causal connection between the particular substance or activity to environment damage.² A classic case of use of the precautionary principle is that of the prohibition of human activity in forest reserves. In such a case the argument forwarded is that human activity poses a risk to forests and that though there is no conclusive proof establishing a causal linkage – it should be banned.

Uncertainty is therefore a crucial prerequisite for the precautionary principle to be applied. Uncertainty in this context refers to the relative lack of consensus in the scientific community.³ The scope of application of precautionary measures must however be based on a minimum of knowledge i.e. on the basis of scientific results representing a degree of consistency.⁴ Thus one of the inherent

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1 Herein reference to the PP does not relate to its textual inclusion within any of the international environmental agreements or treaties.

2 Cameron and Aboucher; "The Precautionary principle: a fundamental principle of law and policy for protection of the global environment" (1991) Boston College International and Comparative Law Review

3 Ibid

4 Chazournes; "The Precautionary principle" in, Precaution from Rio to Johannesburg (Proceedings of the Geneva Environmental Network Roundtable)

requirements of the application of this principle is that of constant reevaluation of the risks, and as a “consequence a regular adjustment and revision of those decisions, relating to protection of the environment or of public health”.⁵

Within the specific context of this sector this characteristic of uncertainty is further exacerbated in terms of threat construction and the persistency of those threats. The threats emanate from not only natural systems but also from socio-economic and political factors that to a large extent determine resource management with the aim of conservation and protection of biological resource. The multiple source of these threats also complicates the decision-making terrain. The decision-making process underlying the application of the precautionary principle however, focusses extensively on gathering of scientific evidence that facilitates value-based balancing between the evidence gathered and the persistence of that threat on the face of uncertainty. This kind of an approach is however limited both in its ambit and in its scope of application. It is reduced to a simplistic collection of scientific evidence which fails to appreciate the complex nature of interaction between each of the sources of threats. We should also be sensitive to the distribution of the costs in terms of identification of threats – the removal of which – would have specific poverty and livelihood security impacts. More fundamentally there has been a number of documented evidences of the operational failures resulting from this kind of decision making framework that overvalues some variables over others.

There is therefore an urgent need to revisit the process and methodology of application of PP within this context. This would necessarily imply the following: firstly to ensure that it is not only scientific knowledge that is relied upon as a basis for decision-making, we should incorporate other sources of information viz. traditional ecological knowledge that has been validated over centuries and is based on experiential learning. This would make the structure more robust and broadbased as it would also include the socio-economic impacts. Secondly procedurally speaking the admittance of evidence should be liberalised to include oral evidence, this would not only result in the lowering the cost of producing evidence but would also facilitate access to justice for stakeholders that are adversely impacted by such decisions – who however due to resource constraints are unable to represent themselves, though they invariably are the the worst affected by such a precautionary decision.

Part II: Application of the Precautionary Principle in Natural Resource Management – focussing on for conservation and protection of biological diversity

The variance in meanings has not only permeated the substantive usage of the precautionary principle but has extended itself to the issue of terminology. It has been contended that the usage of precaution as an “approach” or principle would impact differently on the state parties involved in the application of precaution. Some analysts have raised issues like whether “precautionary approach” is a weaker version relative to that of the “precautionary principle”. The precautionary approach is the term used to describe more organised attempts by risk managers to evaluate the likelihood of specific risks prior to commercialisation. The precautionary principle on the other hand is characterised by a subjective approach to dealing with risks, which involves a search for reassurance in face of uncertainty over a supposed risk.⁶

This explanation seems to suggest two possible outcomes. Firstly that the precautionary approach functions like an environment impact assessment, wherein in the face of there being a risk of environmental consequences resulting from any activity, one should undertake risk assessment and the decision must be based on the scientific data produced. This is unlike that of the application of the precautionary principle, which involves a policy decision in the context of insufficiency of scientific data. Secondly the precautionary approach obligates government agencies to undertake risk assessment studies so as to gather scientific data to support any policy decision taken. On the other hand precautionary principle very clearly shifts the burden of proof on the person undertaking to change the status quo.

Within the specific contexts of conservation and protection of biodiversity, it is largely the “precautionary principle” that has been followed. The CBD refers to it under Principle 15 of the Rio Declaration. It has also been included extensively within the Biosafety framework (Cartagena Protocol on Biosafety), invasive alien species (Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that threaten eco-systems, habitats or species⁷) and the CITES.⁸ There are several other forums or specific resolutions in which the principle⁹ has been reiterated. Its adoption and implementation however remains mired in controversies – which in turn has delayed its usage and

5 Ibid

6 Supra note 5

7 Annex, Decision VI/23 of the CBD.

8 Precautionary principle is a criteria determining the listing of species under CITES appendices (Res. Conf 9.24 Rev)

9 See International Law Association, London Statement of Principles Relating to the Formation of General Customary International Law (London: ILA, 2000).

active implementation in specific contexts/issue areas within biodiversity conservation.

Principle 15 of the Rio Declaration:

In order to protect the environment, the precautionary approach shall be widely applied by the states according to their capabilities. 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.

Despite the considerable confusion over both the substantive and procedural aspects of application of the precautionary principle; one can however preliminarily delineate certain characteristics of the principle (though the nature and scope of these are largely determined by the context and issue area in which it is applied). Following are certain such aspects:

- Threats: The presence of threat is an unqualified condition for the application of the precaution. The extent of threat and the level of evidence however, varies according to specific contexts of application.
- Lack of full scientific certainty: This is the most contentious point of the debate. Most policy documents stress on the fact that there should be an a priori scientific stock taking. Others have however pointed out that the threshold of decisionmaking for marking a scenario as one that is scientifically uncertain is entirely subjective. In this context the SPS¹⁰ version of the precautionary principle under which there is a regular process of information gathering in order to validate the decision taken at the pre-information stage, is seen to be as a more nuanced version.
- Cost-effective measures: this is one of the aspects of the application methodology which takes into account the relative costs and if contextualised within the national context – this would mean that the firstly there would be a calculation of the costs of its application, also on the allocation of the costs between the various affected parties.
- Reversal of burden of proof: procedurally this is one of the outstanding features of the application of the

precautionary principle: under this the persons undertaking activities that may result in harm (environmental and health) have to provide absolute proof that their activity are safe. This procedural aspect is also related to the above point of calculation of costs. Since the cost of proving an activity to be environmentally benign may be prohibitive for those who are going to be affected by such a decision. There is therefore access to justice issues that are intrinsic to the whole question of the nature and costs of evidence to be produced to fulfill the shift in the burden of proof. The standard of proof demanded is also very high and the consequences may include complete prohibition of activities.

The scope and nature application of the precautionary principle in biodiversity conservation is also influenced by the characteristics and nature of the sector that are intrinsic to the sector. Some of these include the nature of uncertainty – ecosystems are characteristically the most diverse and therefore the quotient of uncertainty is difficult to gauge. It is therefore suggested that the guidance for the application of the principle should not only be derived from the experimental ex-situ learning of the scientific laboratories but should equally (if not give more weightage to) rely on the experiential learnings of traditional ecological knowledge that is local specific. Also in the context of threats – its nature in this sector is distinct from those within industrial applications. The other relevant aspect, is that of the existence of multiple sources of risks that would need to be addressed within any decision making framework. More implicitly, one needs to take into consideration the distributional and other equity consideration of the application of precaution in NRM and biodiversity conservation.¹¹

In this context, the efforts of government agencies to stop jhumming and its condemnation as a single major cause of deforestation and environmental degradation is an illustration of the unilateral application of the precautionary principle that is at once unsustainable and having grave negative equity impacts. Several scholars have provided anthropological evidence that has shown that under conditions of stable population growth, shifting cultivation is in fact a highly efficient and supports an ecologically sustainable use of resources.¹² Others have contended that “some of largest natural forests exist in areas inhabited by

10 Article 5.7 Agreement on Sanitary and Phytosanitary Measures (one of the covered Agreements under the WTO); states that: “In cases where relevant scientific evidence is insufficient, a member may provisionally adopt sanitary or phytosanitary measures on the basis of available pertinent information, including that from the relevant international organizations as well as from sanitary and phytosanitary measures applied by other Members. In such circumstances, Members shall seek to obtain the additional information necessary for a more objective assessment of risk and review the sanitary and phytosanitary measure accordingly within a reasonable period of time.” Emphasis added.

11 See Cooney R. (2004). The Precautionary Principle in Biodiversity Conservation and Natural Resource Management: An issues paper for policy-makers, researchers and practitioners. IUCN, Gland.

12 Gadgil, M. and R. Guha. (1997). This Fissured Land: An Ecological History of India. Oxford University Press, New Delhi.

slash-and-burn cultivators for centuries, whereas intensive plough-cultivation has destroyed forests wherever it is practiced".¹³ Thus notwithstanding ground evidence of the fact that regulated jhumming is in fact a highly sustainable exercise, the present framework of decisionmaking (underlying the application of precautionary principle in the context of conservation of biological resource) is inherently constrained from incorporating such nuances and evidence.

Another case in point of the detrimental effect of the present framework of application of the precautionary principle; is the stopping of grazing activity in protected areas. In 1982, the Nanda Devi Biosphere Reserve (NDBR) in Chamoli district of the Garhwal Himalaya, several hundred Bhotiya tribals living in the peripheral villages of Lata, Tolma Peng and Rini were deprived of their livelihood when the grazing ban came into effect. Subsequently in June 1998, they went on a hunger strike and forcibly entered the park's core zone to reclaim their traditional rights of gathering forest produce and grazing their cattle. "The people claimed that when they entered the protected area, they were shocked to see the dismal state of the forests that the forest department claimed to have maintained for the last sixteen years. Incidentally, the tribals themselves always used to enter these regions on barefoot, since they have traditionally considered the Nanda Devi park area as sacred territory. The villagers also found that the medicinal herb base, which they have been harvesting in a sustainable manner over the centuries, had also been recklessly plundered."¹⁴ The other repercussions of the ban on grazing has been an explosion in the growth of weeds resulting in the destruction of the herbs – the very purpose for which the ban was applied in the first place. This illustrates the crux of the problem; that is of an over reliance on scientific evidence in the application of the precautionary principle; crucially ignoring historically and anthropologically validated traditional ecological knowledge – which not only has grave socio-economic consequences but is also inherently unsustainable and therefore ultimately unsuccessful in the long run.

Part III: Traditional Ecological knowledge and NRM

Traditional ecological knowledge (henceforth TEK) forms a component of the concept of traditional knowledge. It is that part of the larger concept of traditional knowledge that is specifically related to the ecological processes that

underlies the natural world (flora and fauna). It shares the characteristics of traditional knowledge in terms of beings experiential in nature, local specific, have been validated over several years and transferred over generations primarily orally. Traditional ecological knowledge refers to a "body of knowledge built by a group of people through generations living in close contact with nature. It includes a system of classification, a set of empirical observations about the local environment, and a system of self-management that governs resource use".¹⁵

Traditional ecological knowledge has historically been one of the chief guiding principles in the development of a sustainable resource management policy at the local level. The primary carriers of TEK has been the tribals and other groups those are primarily dependant on forest resources to meet their subsistence and livelihood needs. In that sense these groups not only derive their daily food intake but also their subsistence economy is based on these natural resources. Access to these resources and their sustainable usage is therefore intrinsic to their existence themselves. Over several centuries these groups have developed deep knowledge of the various seasonal patterns, vegetative processes and the habitats of the flora and fauna and therefore are uniquely situated in terms of their understanding of the entire ecosystem in which they live. The other important characteristic of this knowledge is that since it is based primarily of experiential learning it is intrinsically aligned to the changes in the eco-system and therefore is quick to internalise such changes (otherwise barely perceptible) into the value system that underlies the decisionmaking framework on natural resource allocation at the local level.

Despite such obvious advantages of incorporating traditional ecological knowledge and mainstreaming it into the formal decision-making structure precious little has been done. This reflects the overwhelming belief and reliance on the western scientific discipline that is almost hegemonic in the nature of its adherents by its believers. Criticisms has been levelled at traditional knowledge that it is unscientific in its origins and cannot be validated. One cannot but disregard and reject such arguments as they are basically based on a monist construction of knowledge sources. Also one should also take into consideration the social costs and the distribution and equity aspects of NRM decisions that apply a version of PP that is almost unilaterally based on evidence gathered from western scientific laboratories.

13 Von Furer-Haimendorf. C; 1982 Highlanders of Arunachal Pradesh. Vikas Publishing House, Delhi.

14 Sarma; Kumar, U. (2004). Tribes and Forest Policy in the Light of Participatory Conservation. Paper presented at the National Seminar on Tribes, State Policies and NGOs. India International Centre; New Delhi. March 2004.

15 Studley (1998), Dominant Knowledge Systems and Local Knowledge; Mtn-Forum On-line library document, <http://www.mtnforum.org/resources/library/stud98a2.htm>. Accessed on 15th July 2005

The efficacy of the usage of traditional ecological knowledge in the process of decisionmaking is obvious. TEK is a body of knowledge that is experiential in nature and therefore the best attuned to the changes in the eco-system both over a short-term and more importantly over the long-term. Also since it is local specific it is adaptable to the changes in the specific eco-system. Moreover it is a body of knowledge that has been successfully validated over generations by users of the knowledge. It is also a knowledge system that is easily accessible and cost-effective in terms of transaction costs.

In the specific context of application of the precautionary principle in the NRM; TEK can become a crucial tool in dealing with the unique characteristics of the sector as was discussed above there are certain inherent characteristics on the natural resources sector that make it relatively more difficult to deal with the various variables in arriving at a precautionary decision. TEK in this sense is uniquely placed to enable the PP decision-making framework to work-out a logical variability chart in terms of weighing of variables that have to be taken into consideration while arriving at a decision based on the PP.

In terms of the procedural aspects, internalising TEK into the decision making framework underlying the application of the precautionary principle holds immense benefit in making the framework more broadbased and consultative in nature. This would allow the participation of stakeholders – not only policymakers, but those who will be affected by any such precautionary decision taken.

Conclusion

The application of the PP within NRM is still largely ad hoc in nature reflecting the deep inconsistency in the application of PP. One needs to undertake a stock taking of the situation in terms of realizing that there exists a separate body of knowledge that is experientially driven, local specific and cost-effective. Additionally one would also need to undertake a cost benefit analysis of the distributional aspects of a NRM decision that applies the PP solely based on scientific evidence. Studies have shown that this kind of an overt reliance on laboratory driven science has resulted in negative impacts that have further exacerbated the conflicts and lead to depletion of natural resources and impact biodiversity conservation negatively¹⁶.

Procedurally speaking the internalising of TEK within the PP decision-making framework would hold substantive benefits for tribals and other groups that are usually the most affected parties – in any PP decision – that usually result in prohibition of activities. These may be in terms of costs of

admittance of evidence – which will substantially decrease – if they are allowed to produce evidence from TEK. This would also address questions on access to justice that have become a sore point of contention amongst local persons affected by such decisions and the enforcement agencies that arrive at such decisions with little or no participation of the affected persons.

The above discussion supports the fact that internalising TEK in the application of the precautionary principle in NRM holds substantial benefits not only procedurally (significantly for those affected) but also for the decision makers; in terms of providing a historically validated, cost effective knowledge base that would provide real benefits and opportunities for developing a better and more methodologically effective decision-making framework.

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