

## Workshop Final Report

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# The Precautionary Principle in Natural Resource Management and Biodiversity Conservation



Jeremy Holden/FFI: Lucia Lashimosa & captive-bred Panay Cloud Rat (*Crateromys haeneyi*).

Held as part of the Fourth Regional Session for Asia of  
the Global Biodiversity Forum, South-East Asia  
Manila, The Philippines  
June 20th-23rd 2004

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## **WORKSHOP STATEMENT**

### **TOWARDS BEST-PRACTICE GUIDANCE**

**The following points emerged from discussions at the workshop on “The Precautionary Principle in Biodiversity Conservation and Natural Resource Management”, Manila, The Philippines, Asian Regional Session of the Global Biodiversity Forum: Southeast Asia. 20th-23rd June 2004**

#### **Uncertainty**

Uncertainty is characteristic of complex systems, including ecosystems. In NRM/biodiversity conservation in general, and particularly in developing countries, decisions must typically be made on the basis of great uncertainties, and in the face of multiple risks. Requiring all information to be in place before making conservation/NRM decisions, and knowing exactly the outcomes of those decisions before undertaking them, is not practical or feasible, especially where resources/capacity are limited. In these circumstances it is helpful to adopt an adaptive management approach, which includes monitoring and periodic review to provide feedback, and amendment of decisions in the light of new information. The involvement and consultation of stakeholders is an important element of this process. The precautionary principle should be implemented and understood in a manner consistent with this approach.

#### **Explicit and implicit uses of the precautionary principle**

Some instances of application of the precautionary principle are explicit and unambiguous, while others are implicit. However, examining the use of the precautionary principle where it is not explicit requires examining the context and motivations for decisions and management interventions. It is not always easy to determine whether decisions or management interventions have been implicitly precautionary, especially as many decisions in biodiversity conservation/NRM, take place in the face of some uncertainty.

#### **What is serious or irreversible harm?**

The question of what constitutes serious or irreversible harm may be dependent on context and circumstances. For instance, this will vary widely according to sector, and on the objective(s) of management. Irreversibility alone may be an inadequate criterion, as many changes, including the deaths of individual organisms, are clearly irreversible. Determination of serious or irreversible harm is likely to vary according to the scale at which precautionary action is being applied/considered. For instance, it may vary from the international, to the national, to the local level. At each level, the background of other laws, policies, objectives etc. need to be considered.

Determining serious or irreversible harm will always be a question involving judgement and values. However, judgements should be informed, rather than arbitrary. All available information should be taken into account, including indigenous and traditional knowledge as well as science.

Perceptions of risk and harm will vary, including according to the urgency of other priorities, such as poverty alleviation.

#### **How should ‘serious or irreversible harm’ be determined?**

Because this determination necessarily involves judgement, perception and values, the question of “who decides” is extremely important. In many cases it will be appropriate for decisions to be made by those responsible for management, including, in particular, national and local levels of management.

Decisions on what constitutes serious/irreversible harm should be consultative and involve relevant stakeholders. These include in particular those who bear the costs of environmental harm, and poor or marginal groups who may bear costs of precautionary action. Where decisions involve

shared or transboundary resources, such as fisheries in transboundary river basins, all relevant management units should be involved.

### **Application of the precautionary principle: assessing costs and benefits**

The precautionary principle is often understood and applied in ways that emphasise averting potential conservation threats. The potential conservation benefits that may result from a particular intervention may be ignored. This can lead to “missing out” on conservation benefits that can be gained by actions that pose some level of conservation risk. In making judgements and decisions based on the precautionary principle, the costs and the benefits of both action and inaction should all be taken into account. These costs and benefits should not be limited to conservation, but should include livelihood, socio-economic, food security and relevant “intangible” costs and benefits.

### **Indigenous and traditional knowledge and management practices**

Indigenous and traditional knowledge and management practices are very important in the context of NRM and biodiversity conservation. These are frequently ignored in “precautionary” decision making based only on the science available to policy/decision-makers. Applications of the precautionary principle should be based on understanding of indigenous and traditional knowledge as well as scientific information.

The precautionary principle has often been used as a rationale to support conservation interventions which are detrimental to indigenous people’s aspirations to use wildlife and biological resources to support livelihoods. Precautionary conservation interventions are likely to be more effective when indigenous and local people are involved in the decision-making process and in management. Many traditional and local people reliant on biological resources are likely to be supportive of a precautionary approach to resource management, when their needs and viewpoints are included in the process, particularly where communities have been negatively affected by resource degradation.

### **Information gathering**

Decisions using the precautionary principle should be accompanied by efforts to seek further information, and reduce uncertainties. The precautionary principle should be applied as part of a dynamic management process including monitoring the impact of the precautionary decision, and “revisiting” the decision regularly. However, constraints of resources and capacity need to be taken into account.

### **Tools for implementing the precautionary approach**

We need to establish tools to operationalise the precautionary approach in NRM/conservation. These could include information resources based on research findings and outputs, and experiential and indigenous/traditional knowledge, to assist decision-making and management.

## WORKSHOP PROGRAMME

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**Venue: Hotel Astoria Plaza**  
**Hosts: Department of Natural Resources (DENR)**

**Wednesday June 21st**

### OPENING PLENARY

#### ***Introduction to the Workshop by Dr Barney Dickson***

The Precautionary Principle in NRM and Biodiversity Conservation: Issues and Problems

#### **Dr Rosie Cooney**

The Precautionary Principle Project

#### **Mr Lorenzo Agaloos**

PAWB, Department of Natural Resources The Philippines

#### **Professor Bharat Desai**

(presented by Barney Dickson)

School of International Studies Jawaharlal Nehru University

The Precautionary Principle in Multilateral Environmental Agreements on Biodiversity

#### **Dr Brendan Moyle**

Department of Commerce, Massey University, New Zealand

Uncertainty, Complexity and the Precautionary Principle

#### **Mr Madhu Regmi**

Ministry of Forests and Soil Conservation, Nepal

The Precautionary Principle in Natural Resource Management and Bio-diversity Conservation (with special reference to Nepal)

**Tuesday June 22nd**

#### **Dr Barney Dickson**

The Precautionary Principle Project

Applying the Precautionary Principle in Biodiversity Conservation and NRM: Some Key Issues

#### **Dr Paul Teng**

WorldFish Centre, Malaysia

The Precautionary Approach (PA) in Living Aquatic Resource Management

#### **Ms Christine Casales**

WorldFish Centre, The Philippines

FishBase: towards building a tool to assess species invasiveness in a precautionary framework

#### **Mr Rezal Kusumaatmadja**

Marine Aquarium Council, Asia

Applying the Precautionary Principle for Coral Reef Conservation and a Responsible Marine Aquarium Trade through MAC Certification

#### **Dr Tonie Balangue**

Resources and Environmental Economics Foundation of the Philippines (REAP)

The Precautionary Principle in Biodiversity Conservation: Experience in the Philippines

#### **Ms Nanki Kaur**

Energy and Resources Institute, India

Meaning, Impact and the Implementation of the Precautionary Principle in biodiversity conservation: Perspectives from India

#### **Implementing the Precautionary Principle in Biodiversity Conservation and Natural Resource Management**

***How should the precautionary principle be implemented to support both biodiversity and livelihoods?***

Review and discussion of draft guidance for best-practice

**Wednesday June 23rd**

Final discussion and agreement of recommendations and outputs

Presentation to Plenary by Jim Sampulna, DENR

## **WORKSHOP SUMMARY by Rosie Cooney, *The Precautionary Principle Project***

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### **“The Precautionary Principle in Biodiversity Conservation and Natural Resource Management”, Manila, The Philippines, Asian Regional Session of the Global Biodiversity Forum: Southeast Asia. 20th-23rd June 2004**

During this workshop presentations were made by participants from a range of SE Asian and Asian countries, on a wide range of subjects in natural resource management and biodiversity conservation, including aquaculture, forestry, control of alien invasive species, decision-making under uncertainty, and conservation law and policy in The Philippines. Discussion was extensive, resulting in the general agreement of the Workshop Statement. Particular attention was paid to the following topics.

It was pointed out by many participants that in developing countries, decisions virtually always had to be made and management had to proceed under conditions of uncertainty. One participant referred to conservation as governed by “the principle of incomplete information”. In the face of this uncertainty, participants stressed that the precautionary principle should not be employed as a block to action wherever there were threats of uncertain harm. Considerable discussion emphasised ways of managing and dealing with uncertainty, including scenario planning as a way to assess and choose management strategies, and using adaptive management as a management approach. It was generally thought that when dealing with uncertainty a precautionary approach should be taken, but it should be interpreted and applied within an adaptive management framework.

The workshop discussed at length the question of what constitutes serious or irreversible harm, to which a precautionary approach should be taken, and through presentations and discussions it became clear that it was difficult to develop clear guidance on this question, and that it had to be answered on a case by case basis in a participatory manner.

It was stressed in several presentations that decision-making should seek to assess the costs and benefits of both action and inaction. One problem with the precautionary principle is that it is often understood as being passive, or blocking action. Participants were generally agreed that the costs and risks associated with the passive strategy, or the status quo, should also be brought into the equation.

Indigenous and traditional knowledge was highlighted in discussion, and there was a general viewpoint that this knowledge was often inadequately incorporated into decision-making. Scientific knowledge available to decision-makers often did not adequately reflect people’s traditional understanding of the resource and how to manage it. However, it was emphasised that not all local people reliant on resources have traditional, well established understanding of resource management.

The economic and livelihood context of conservation decisions involving the precautionary principle was heavily emphasised in presentations in discussion. There was agreement that the precautionary principle had to be understood and applied in ways that were realistic and pragmatic and took into account livelihood and economic goals and needs. For instance, in discussion about the use of the precautionary approach with respect to the introduction of alien species for aquaculture, the great and increasing contribution of this to the region’s protein was highlighted. It was clear that a precautionary approach to potential environmental harm would in practice have to balance uncertain risks against the food security and economic gains.

Finally, the workshop highlighted the lack of technical tools to operationalise the precautionary principle in various sectoral areas, and strongly emphasised the need for such practical tools for implementation.

## WORKSHOP PARTICIPANTS

| Participant Name            | Affiliation   | Country     | Email  |
|-----------------------------|---|-------------|--|
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## **PRESENTATION ABSTRACTS**

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### **1. Mr Lorenzo Agaloos (The Philippines Protected Area and Wildlife Bureau of the Department of Natural Resources)**

#### **Precautionary Principle in the Philippines Wildlife Act of 2001**

The Philippine's Wildlife Resources Conservation and Protection Act (RA 9147) of 2001 is an important legislative measure geared towards ensuring environmental sustainability. It aims to protect the country's fauna and flora from illicit trade, abuse and destruction, through (1) conservation and protection of wildlife species and their habitats, (2) regulation of wildlife collection and trade (3) pursue, with due regard to the national interest, the Philippine commitment to international conventions; and (4) initiate or support scientific studies on the conservation of biological diversity.

Emphasis of the Act is on the regulation of wildlife collection for scientific research, commercial and conservation breeding/propagation, bioprospecting, as well as traditional and commercial use. In a sense, the provisions of RA 9147 integrates the precautionary principle as provided for by the Convention on Biological Diversity, and as a response to the rapid decline of wildlife resources in the Philippines. This is evident in the provisions on 1) establishment of economically important species including schedule and volume of allowable harvest; 2) prohibition on the collection of threatened species except for scientific research and commercial breeding as may be authorized; 3) prohibition on the introduction of exotic species in protected areas and critical habitats; and 4) requirement for thorough evaluation of activities dealing with genetically engineered including pathogenic organisms.

Insufficient information on the status, distribution and population of wildlife species has rendered very difficult the formulation of specific regulatory measures for the utilization of wildlife species in the country. The Wildlife Act recognizes this lack of scientific basis for setting specific regulations. Nevertheless, it provided general measures that restricts detrimental utilization of wildlife resources and at the same time promotes the needed action to generate the required information in the formulation of specific measures i.e. seasonal collection, setting allowable harvest volume. Such information shall be made available in the future on the basis of scientific studies.

### **2. Dr Tonie Balangue (Resources, Environment and Economics Centre for Studies)**

#### **Impacts on Livelihood and Poverty of Precautionary Approaches in Forestry and Protected Areas in the Philippines: an Inventory and Case Studies.**

This talk presented the plans for a case study to be carried out investigating this topic. The aim of the study was to review NRM & Biodiversity Policies, in order to identify provisions that demonstrate precautionary approach (PA) in managing biodiversity and natural resources, and also those that impact on livelihood and poverty of the stakeholders. The effectiveness of these provisions as implemented in real situations would also be assessed.

In order to do this, three specific objectives would be considered. Firstly, the risks and irreversible impacts on natural resources and biodiversity would be identified, and the sufficiency of policies affecting precautionary measures (PMs) in the Philippine forestry and protected services sector evaluated. Secondly, pro-poor policies and programs that implicitly invoke precautionary approach to NRM and Biodiversity Conservation would be assessed and evaluated for the existence of a mechanism to effectively prevent adverse NRM and BC decisions. Thirdly, two on-the-ground case studies of precautionary approaches would be carried out, with focus on the impacts on livelihoods and poverty under a BCA framework.

### 3. Ms Christine Marie V. Casal (WorldFish Centre)

#### **FishBase: Towards Building a Tool to Assess Species Invasiveness in a Precautionary Framework**

The precautionary approach to species introductions has been espoused by several organizations like the FAO, ICES and IUCN. This is to partly address the uncertainty of a species becoming established in the country and environment it has been brought in as well as the irreversible ecological impacts alien species may bring. At present risk screening protocols for introduced species are largely based on qualitative categorizations or expert opinions, however, quantitative, repeatable and transparent assessments are being promoted by the National Research Council of the United States as the next generation of risk assessments. This entails having biological information about the species proposed for introduction as well as impacts of the species where they have been introduced available in electronic format and freely accessible to users.

FishBase, an information system which contains biological, ecosystem and country data on finfishes has also been developing and incorporating global information on introduction of fish species. This is being developed with FAO which initially provided Fishbase with information from their DIAS (Database of Introduced Aquatic Species). FAO gather introductions data from their member countries through questionnaires. FishBase introductions data come from published information sources including books, journal articles and project reports. Together, these data sets become powerful tools to show the magnitude and breadth of the movement of fish species as well as the impacts of species introductions.

There are over 3,300 records of species introductions globally as recorded in the database, roughly 60% of which have established in the wild. In the ASEAN region comprising of 10 member countries (Brunei, Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand and Vietnam), 348 introduction records have been logged, 39% of which have been reported as established in the wild. This is by no means complete as there has been no exhaustive assessment of fish species which have been introduced to the different countries to date. The importance of aquaculture in the ASEAN region cannot be overemphasized. Indonesia, the Philippines and Thailand rely heavily on introduced species for aquaculture, with 72%, 77% and 46% of aquaculture production from non-native species in 2000. Increased trade and tourism has also exacerbated the movement of alien species. The aquarium industry has been identified as the probable source of marine introductions like the Indo-Pacific lionfish *Pterois volitans* in the Western Atlantic.

Presently, there are several reports related to alien fish species which are accessible on CD-ROMs, DVD and web interfaces of FishBase ([www.fishbase.org](http://www.fishbase.org)):

1. The matrix of species introductions provides the overall view of global introductions.
2. List of species introduced into particular countries.
3. List of species which have reported adverse introductions where they have been introduced.

The biological characteristics of the species and its environmental requirements play a major role in species establishment. Species introduced for aquaculture almost always escape aquaculture facilities and make their way to natural waters, others released from aquaria are also able to thrive in natural waters.

4. The species summary page provides information on the taxonomy, distribution, biological characteristics and environmental characteristics among others in one page, another report which is available for over 28,500 fish species in the database.

In the near future, a customized species summary page from FishBase (on species invasiveness) will be available and it will show only characteristics which are useful to assess species invasiveness, where the species have been introduced and their impacts. It will also provide linkage to other databases which have similar information to allow users ease of access to related

sources. Nothing would be better than an exhaustive study done on the field assessment of a species probability of establishing and being invasive after introduction but for several countries this is not possible. Developing countries can not afford field assessments while other countries may not be willing to spend for the exercise.

Developing an information system and decision making tool which provides biological data to assess species behaviour prior to introduction is of vital importance. This would provide a cost effective way of getting information on species being assessed for introduction into a specific country. This desk top decision making tool could provide a system to better plan and manage natural resources. Organizations can work towards this pooling resources and institutional strengths for a risk assessment tool which can warn managers and decision makers of species which are likely to establish and become invasive in their proposed ecosystems.

#### **4. Dr Rosie Cooney (The Precautionary Principle Project)**

##### **The Precautionary Principle in Biodiversity Conservation and Natural Resource Management**

The precautionary principle is a central and important principle of sustainable development law and policy, and has been widely incorporated into law, policy and management at multilateral and, increasingly, national level. However, it remains highly controversial, and has sparked dispute within arenas such as the WTO, the CBD, WSSD and CITES. Precaution raises a number of issues, including potential conflicts between environmental protection and trade/development, abuse for trade-protectionist ends, and debates around sustainable use vs protectionist conservation approaches. Currently there is little consensus on its acceptance, little shared understanding of its meaning, inconsistency in its implementation between different sectors, issues and regions, and little information on its practical impacts. This leads to confusion and controversy, and can result in poor conservation outcomes and negative livelihood and development impacts. The Precautionary Principle Project is a collaborative initiative of research, dialogue and policy development. It seeks to develop better understanding of issues surrounding precaution, and develop best-practice guidance for its application in NRM and conservation in a manner that respects both conservation and development priorities. While substantial debate and dialogue has focused on the precautionary principle in recent years, comparatively little attention has been paid to its use in the context of “green”, biodiversity-related issues, and little analysis of precaution in the context of sustainable development, livelihoods, and poverty alleviation has been carried out. This workshop will review and discuss case studies and analyses of precaution in practice across a range of NRM areas, including fisheries management, alien invasive species, utilisation and trade of wild species, protected area management, and sustainable forest management, and develop recommendations for its operation. The outcomes will contribute to the development of “best-practice” guidance for application of the precautionary principle and feed into ongoing project activities including development of case studies, further regional consultations and workshops and inputs into relevant policy arenas, including the IUCN World Conservation Congress.

#### **5. Dr Bharat Desai (School of International Studies, Jawaharlal Nehru University)**

##### **Some Legal Reflections with Reference to Biodiversity Related MEAS**

This presentation seeks to assess the use of the precautionary approach in the efforts of global regulation to address emerging environmental challenges (with focus on biodiversity related conventions). The use of a precautionary approach in regulation is novel, but after gradual introduction through ‘soft law’ instruments, and prominence at the Rio Earth Summit, it has even begun to be used in some ‘hard law’ instruments. It seems precautionary measures have helped states to act together on some environmental issues, despite scientific uncertainty. However,

these instruments may be less robust than they seem? In addition, developing these new treaties is now a process taking years, while the effects of any regulatory actions by states may still be unclear. To give legal value to the precautionary approach, the insertion of the word 'precaution' may be less important than the intention of committed states and the precise phrasing of a legal instrument.

## **6. Dr Barney Dickson (The Precautionary Principle Project)**

### **Applying the Precautionary Principle in Biodiversity Conservation and Natural Resource Management: Some key issues**

This presentation addresses the question of how to develop guidelines for operationalising the precautionary principle. As the formulation of the principle that appears in Principle 15 of the Rio Declaration shows, the principle is very general and quite modest. On its own it does not determine what is to be done in specific situations. Hence guidance is needed. The European Commission has developed some guidelines for implementing the principle. Three key issues that need to be addressed by any proposed guidelines are: What counts as serious and irreversible damage? How should the costs and benefits of action and inaction be taken into account? How does the search for better and new information relate to the application of the principle?

## **7. Ms Nanki Kaur (The Energy and Resources Institute)**

### **Meaning, Impact and the Implementation of the Precautionary Principle in biodiversity conservation: Perspectives from India**

The Precautionary Principle has been applied extensively in the context of natural resource management and biodiversity conservation. However its application to biodiversity conservation, through management approaches like 'protectionism', the ecosystem approach and adaptive management have led to varying degrees of socio-economic impacts on local livelihoods. Such livelihoods, based on traditional practices and institutions, are believed to have in place mechanisms for sustainable resource use, which effectively address conservation and livelihood priorities relating to income generation, security (based on ownership and access to natural resource use) and equitable benefit sharing of resources.

In this context, the aim of this paper is to facilitate dialogue that will either validate India's biodiversity conservation strategies, based on state initiated protected area management plans, and/or assess the potential and the means of adopting traditional precautionary natural resource management practices within current state initiated approaches.

Such a dialogue is expected to provide an insight into the meaning and the impact of the precautionary principle on conservation and local livelihoods; within protected and community conserved areas so that the three priorities of sustainable development – conservation, sustainable resource use and equitable sharing of benefits – may be addressed in implementation.

The paper will thus provide a brief overview of the meaning and the legal and institutional framework related to the application of the Precautionary Principle in India, from the national to the local level.

The second section of the paper will highlight how traditional mechanisms, related to jhum (shifting) based agriculture, which contributes significantly to tribal livelihoods and is practiced through traditional institutions in biodiversity rich areas surrounding the Kaziranga National Park in Assam, address livelihood and conservation priorities.

## **8. Mr Rezal Kusumaatmadja (Marine Aquarium Council)**

## **Applying the Precautionary Principle for Coral Reef Conservation and a Responsible Marine Aquarium Trade through MAC Certification**

A responsible marine aquarium trade that is based on well-managed resources and shared responsibilities through the trade chain provides a unique opportunity and model for establishing reef management and conservation in an extensive network of areas where the collection of marine ornamentals occurs. Stakeholders ranging from the collectors/fishers in remote coastal areas, and hobbyists as the end buyers, are beginning to realize that the trade's survival depends on the health of the coral reef ecosystems supporting the fishery.

A well-managed marine ornamentals trade, including trade in CITES listed "hard" corals, can create long-term ecological and socio-economic benefits, and also create incentives for the local communities to manage and conserve the coral reefs on which they depend for their livelihoods. MAC Certification, through the implementation of MAC Standards and Best Practices, offers a "win-win" situation, linking environmental, social and economic benefits. The Precautionary Principle is a key component of this.

Reef and fishery management and conservation are key requirements of the MAC Standard for Ecosystem and Fishery Management (EFM). Concerned parties in harvest areas are required to develop a Collection Area Management Plan (CAMP) through a multi-stakeholder consultation process. In practice, the development of the CAMP must employ the Precautionary Principle of because of the lack of information on target species, including: life-history characteristics, abundance and distribution, temporal and spatial variation, previous harvest levels. In addition there is usually no baseline data on reef conditions in harvest areas. This lack of information also extends to socio-economic aspects of the marine aquarium trade within a given community.

To improve the scientific basis for the management of marine aquarium fisheries and the reefs that support them, MAC has partnered with the Global Coral Reef Monitoring Network (GCRMN), via Reef Check, to develop the Marine Aquarium Trade Coral Reef Monitoring Protocol (MAQTRAC) methods, in order to assess and monitor coral reefs and populations of organisms harvested for the aquarium trade, and provide data for improved management. A baseline assessment using MAQTRAC is required as input to help ensure that best available knowledge is obtained and integrated into the management planning. To improve the socio-economic basis for working to ensure the marine aquarium trade contributes to sustainable livelihoods, baseline surveys of socio-economic conditions are also undertaken.

The Precautionary Principle is applied in a very practical and real manner in the development and implementation of the management plans required by MAC Certification. This includes the inclusion of no-take areas, thresholds for resource status and catch levels, documentation of catch per unit effort (CPUE), and continued resource monitoring using the standard methods. Further, the management plans are required to be adapted as improved information becomes available.

### **9. Dr Brendan Moyle (Massey University)**

#### **Uncertainty, Complexity and the Precautionary Principle**

The problem of strategic planning under uncertainty is not unique to wildlife management. The problem is ubiquitous whenever managers have to deal with complex systems. Most ecological, economic and social systems have the characteristics of complexity. Complex systems have special characteristics which are outlined. These characteristics prevent managers using models to describe the behaviour of the system. This in turn generates uncertainty about the optimal management decision.

There are several decision rules that can be used to cope with this uncertainty. These range from expected payoff rules through to the precautionary principle. All of these rules have advantages

and disadvantages which are elaborated. The disadvantages of the precautionary principle are outlined. These stem from its extreme timidity in the face of uncertainty as well as discounting potential benefits from the management decision.

The precautionary principle can be usefully employed alongside other decision rules. The workshop concludes by explaining- with reference to extant conservation projects- how the precautionary principle can be made operational. This is based around complementary decision rules that preserve the risk-aversion of the precautionary principle, but avoiding its excessive timidity. These rules stress the need for robust and adaptable approaches rather than depend entirely on precaution as the basis for decision making.

#### **10. Mr Madhu Prasad Regmi (Ministry of Forests and Soil Conservation)**

##### **The Precautionary Principle in Natural Resource Management and Bio-diversity Conservation (with special reference to Nepal)**

Nepal is very rich in terms of natural resources and biodiversity. A broad range of ecosystems flourishes on relatively less area of land in Nepal. Its biodiversity is a reflection of its unique geographic position and altitudinal and climatic variations. A great deal of efforts has been made over the years in Nepal to protect and manage the biological resources and their diversity. It has been recognized that huge natural endowments are the mainstay of Nepal's economy and the well being of its people. If such resources are properly managed and utilized, the growth rate of economic development could be accelerated. Hence, Nepal's current development policies are geared towards poverty alleviation through wise and sustainable utilization of its natural resources.

Our desirable goal is, and should be, the attainment of sustainable development through the wise and rational use of available resources. The process of economic development without considering the regenerative capacity of the mother Earth may be disastrous to both present and future generations. Loss of biodiversity may eventually lead towards an irreversible damage to our own life support system. Use of environmentally unfriendly technologies mainly because of the inherent economic benefits lied therein, or avoidance of risk assessment and mitigation measures may lead towards an unpredictable increase in the cost of development in the long run.

The concept of sustainable resource management adopts the theory of carrying capacity of the natural ecosystem. Nature can recreate the resources consumed by human beings only to a certain limit. Therefore we should use such resources in such a way that it does not exceed their regenerative capacity. Especially, this principle is associated with the consumption of renewable resources. According to the concept of sustainable economic development, resource management means to fulfil the demands of the present and future generations without depleting the available resource stock. Therefore, resource management means not only protection, but also judicious utilization, which fulfil the need of existing generation and guarantees to fulfil the future needs. In this context, the principle of precautionary action deserves significance. The principle lays emphasis on the use of available resources or the application of the available technology in such a way that no significant harm is caused to the environment nor to the regenerative capacity of available resources.

Principle 15 of the Rio Declaration may be considered as a potential starting point for elaborating Precautionary Principle (PP), which provides: Where there are threats of serious or irreversible harm, lack of full scientific certainty about the cause and effects of environmental harm shall not be used as reason for postponing measures to prevent environmental degradation. Achieving sustainable development requires the policies pursued by the State to be based on PP. Environmental measures must anticipate, prevent and attack the causes of environmental degradation. In many instances waiting for scientific proof regarding the impacts of pollutants could result in irreversible damage to the environment and in human suffering. Hence, it is imperative for all the governments and other actors of development to adopt the principle of precautionary action

as the basis of their policy with regard to the prevention and elimination of environmental degradation.

The PP has now-a-days received widespread recognition from the international community. Although the 1992 Convention on Biological Diversity (CBD) does not clearly spell about the principle, its preamble clearly notes that where there is a threat of significant reduction or loss of biodiversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such threat. The principle requires activities and substances which may be harmful to the environment to be regulated, and possibly prohibited, even if no conclusive or overwhelming evidence is available as to the harm or likely harm they may cause to the environment. It also calls for a shift on the burden of proof. This means that where there is an identifiable risk of environmental harm or loss of biodiversity, it may be appropriate to place the burden of proof on the proponent, who wishes to carry out such activity to prove that it is not detrimental to the environment will not cause harm to the environment.

The legal status of PP is still evolving. However, there is sufficient evidence of State practice to justify that the principle has now received sufficiently broad support to allow a good argument to be made that it reflects the principle of customary international law.

Experiences in the past decades with environmental problems have tempted policy makers to reevaluate how we address potential environmental harms. At the centre of this reevaluation is the PP, which reflects the recognition that scientific certainty often comes too late to design effective legal and policy responses for preventing many potential environmental threats. It addresses how environmental decisions are made in the face of scientific uncertainty.

Nepal, as a staunch supporter to the global efforts made towards the protection of the environment and sustainable use of available resources, is fully committed to abide by the obligations set forth by a number of international legal instruments. It is party to a number of multilateral environmental agreements (MEAs). The provisions of such agreements are applicable within the national jurisdiction as the domestic law. Furthermore, our own environmental requirements call for the use of our natural and biological resources in such a way that no harm is caused to the environment. Various policy and legal measures are in place to ascertain that the proposals are implemented by the proponents in environmentally-friendly way. EIA has been introduced in the development projects since early eighties. After the enactment and enforcement of the Environment Protection Act and Rules in 1997, the process of environmental assessment has been made mandatory to the proposals, which are likely cause significant impact on the environment. Environmental impact has been considered as one of the factors to determine the implementability of the development activities with significant environmental impacts. HMG/N has established environment divisions in most of the development-oriented ministries, departments and projects to look after the environmental issues. Furthermore, the judiciary is also playing an active role in the development of a novel environmental jurisprudence. A number of verdicts have been issued by the Supreme Court, which may be considered as a milestone to translate the notion of PP into a living reality. Environmental education has taken place in the primary, secondary and tertiary level education. The level of environmental awareness is on rise. A number of NGOs and CBOs are taking leading role in environmental fora. This has paved the way for taking environmental concerns into consideration while making development decisions beforehand. Nepal, being a least developed country with very low per capita investment on research and development, cannot afford to make decisions based only on scientific certainty. In such a situation, the precautionary principle, as enunciated in a number of legally binding as well as non-binding instruments, may be an effective instrument to prevent the present and future generations of the people from the scourge of environmental disasters.

#### **11. Dr Paul Teng (WorldFish Centre)**

#### **The Precautionary Approach (PA) in Living Aquatic Resource Management**

Living aquatic resource systems have inherent buffering capacity but are also subject to disruptions which result in both reversible and irreversible changes in species composition and type. The PA is a response to uncertainty and inadequate knowledge in order to avoid or prevent changes which may impact ultimately on poor people who derive livelihoods from living aquatic resources. Areas in which it applies include fisheries management, alien invasive spp., spread of pathogens, utilization and trade of wild species, and protected area management. Aquatic resource systems to be considered include most of those which are considered priority by the WorldFish Center – Coral reefs and Coastal waters; Floodplains, streams and rivers; small water bodies, reservoirs and lakes; and ponds. It is necessary to ask what intervention instruments (guidelines, regulations, policies, international treaties/agreements) have potential applicability to each aquatic resource system. There is also a need to balance what is practical against what is desired, as it is easy to fall into the trap of desiring “zero risk”, an unrealistic status in natural resource systems. Supporting databases to benchmark species populations and types, geographic limits, and their relative ecological niches, are sparse for the regions commonly accepted as most bio-diverse. Detection and species monitoring techniques, technology and programs are not in place in most tropical developing countries, neither is the enforcement capacity for international agreements and national policies or regulations. As the global demand for fish increases beyond the supply of 93 Million Metric tons (1997), captured fisheries are projected to decline and aquaculture is anticipated to meet most of the demand for fish. The implications are that intensification processes will occur in both freshwater and marine ecologies, with freshwater ARs showing most growth. Part of the intensification will likely also be with genetically improved breeds of either exotic or indigenous species. Risk assessment techniques, such as those developed for crops modified using biotechnology, and Risk Management under imperfect scientific conditions, will both have to be modified for use on alien species and improved stock (and their pathogens). It is important that epidemiologic and population dynamic principles be taken into consideration in any risk assessment, together with the biological properties of individual species such as their diets, dispersal patterns, fecundity, and generation times. Lessons for LARs may also be taken from the introduction into Asia of many alien plant species for commercial purposes, and from the plantings of millions of hectares of improved crop species, with little to no measurable impact on indigenous related species. A common approach to applying the PA to LARM is feasible, which accepts that imperfect knowledge is the norm and not the exception in developing countries.