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# WATER LAW AND GOVERNANCE

## Three Parallel Processes | By Joyeeta Gupta

FOCUS:

LAW

*How can water law make life easier for these Indian women?*

### INTRODUCTION

➤ **Fresh water is a crucial issue at local through to global levels as it is a basic neces**sity for humans and a non-substitutable resource on which the health of ecosystems depends. Water is, hence, closely related to most global environmental issues as well as globally recurring environmental issues, including desertification, deforestation, biodiversity and climate change. It is also related to social and economic themes such as agriculture, industry, health, transport, energy and tourism. Its importance has been recognized politically in the UN's WEHAB agenda and economically since water has also become big business.

The above has three implications. First, managing water inevitably revolves around the question of who gets what, how, and why; and the question of rights and obligations. These questions lie at the fundamental core of the disciplines of politics and law. Hence, an institutional perspective is vital to understanding how water should be managed. Second, what is often seen as water law and policy is only part of the picture of the laws and policies that apply to management and use of water at national through to global levels. This article highlights the key legal issues that are relevant in governing water. Third, there is an inevitable need to focus on cross-disciplinary fertilization.

In the area of water, three parallel governance processes can be distinguished. The first is the 2000 year bottom-up process of law and policy making. The second is the top-down process of water policy making that has developed over the last fifty years. The third is not a conscious process of water governance but is the result of the forces of globalization which have led to the liberalization of markets, finance and investments and these too have had impacts on water management.

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## EDITORIAL

Law is a special case of norms that regulate human action. Besides law there are other rules, based for example on customary and traditional or on religious and moral principles. These special sets of rules or norms orient and limit, even sanction, human action. Law, and rules in a broader sense, are of key relevance for central questions of IHDP: mitigation, adaptation, and human responses in face of global environmental change in general. In order to develop more sustainable measures we have to understand the dynamics between rules and action or, more generally, between agency and structure.

In this UPDATE's edition on law in the context of global environmental change, the analytical themes of „fit", „interplay" and „scale" play a central role in all research articles. And they all stress the integration of rules, their intelligent adjustment to a given situation and an open governance process. Makane M. Mbengue, in his article on the precautionary principle, writes: the very concept of global environmental governance requires a holistic and systemic treatment of its underlying components.

Merrilyn Wasson analyses the weaknesses and institutional interplay of several regimes with regard to the protection of intellectual property rights and traditional ecological knowledge. She also points out the developing countries' ambivalence towards traditional ecological knowledge as they seek to profit from its exploitation. Meanwhile, Western companies make immense profits on natural products and whole systems of products are becoming the subject of Western patents. Elinor Ostrom stresses the urgency of developing a better scientific foundation for the fit of institutional arrangements to the particular ecological problem under consideration. Universal blueprints do not work, and no single set of rules is equally effective in governing all common-pool resources. She also states that formal rules have to be monitored and enforced in order to remain effective.

Joyeeta Gupta's article on water law and governance reflects on the different customary, political and scientific layers which influence water law. She gives an insight into the complexity and diversity of water institutions and calls for prioritizing the water issue at global level. Marjan Peeters writes about the question of how and to what extent states should adjust their national law systems in order to implement international environmental agreements. She emphasizes integration of rules, in particular with regard to ecological unity of the environment. Finally, the interview with John Scanlon gives us an interesting insight into the work of the Environmental Law Programme of the World Conservation Union.

Special Thanks to Marjan Peeters from the University of Maastricht for her valuable suggestions that helped structure this UPDATE.

THE EDITOR

### THE HISTORICAL EVOLUTION OF WATER LAW: A BOTTOM-UP APPROACH

Since water law exists in a variety of contexts, it differs from region to region. This is because the regional and fluvial circumstances are different; the cultural context is different, the bargaining power of the countries concerned is different and the uses of water have developed at different speeds.

And yet, water law in different parts of the world is quite similar. This is because ideas have moved around the world throughout history. The fundamental principles of ancient Hindu and Islamic water law permeated societies through the spread of religion. Subsequently, Roman water law principles were brought to Continental Europe by Napoleon. In the last three to four centuries, British, French, Spanish and Dutch water law spread to the developing countries through colonization. In the 20th century, communist water law principles spread to the communist bloc of countries. Codification, or the legal process of writing the state of the art of international law, then influenced the drafting of text in new regional water treaties. For example, the Helsinki Rules developed in 1966 by the International Law Association was used as reference material by negotiators in recent decades working on regional treaties. New scientific concepts such as the hydrological unity of water and integrated water resources management are spread by epistemic communities or scientific networks. New legal concepts such as sustainable development are being developed by scholars and these too influence the law making process by being a secondary source of law. And now finally with globalization, concepts such as private sector participation and liberalization are influencing water law.

Hence, water managers in different parts of the world essentially choose from the same menu of choices in relation to water management which includes the concepts of ownership (riparianism, prior appropriation), rights and responsibilities, principles, non-compliance mechanisms and liability at national level; and the principles of restricted territorial sovereignty as well as no-harm, equitable and reasonable utilization at international level.

In other words, water law is multi-layered, where some layers are common and some are different leading to unique situations everywhere. There is a layer of custom and religion; which is then influenced by conquest and colonization, by legal codification, modern scientific concepts and globalization. These layers are superimposed on one another, but do not imply that in fact only the latest text on paper is a true reflection of the situation in the region. Hence, in order to design effective water laws and policies, it is essential to understand the complexity, diversity and dynamism of the existing water institutions.

*Figure 1. Local, national and regional water law is multi- layered*

The similarities in water governance in different regions of the world were codified in the 1966 Helsinki Rules prepared by the International Law Association and more recently in the 1997 UN Law of the Non-Navigational Uses of International Watercourses although the latter has yet to enter into force.

Despite such a long history, there are major water problems and these can be attributed to failures in governance since, first legal institutions from local through to global levels have not been able to keep up with the changing nature of the use and abuse of water resources. Second, while water governance was centralized, decision-making was scattered in different ministries. Third, water institutions have been influenced by mono-disciplinary insights. Fourth, river basin governance was fragmented along administrative boundaries.

## THE PROGRESS IN GLOBAL POLICY MAKING: A TOP-DOWN APPROACH

The urge to think and act globally led politicians and water experts to meet at the first UN Conference on Water at Mar del Plata in 1977. Since then, there have been meetings, inter alia, in Dublin, Rio, Marrakesh, The Hague, Johannesburg and Kyoto. But it was the Millennium Declaration in 2000 and the World Summit on Sustainable Development in 2002 that finally articulated global goals on water access and sanitation. A key goal is to halve the proportion of people without access to water and sanitation by 2015. However, this goal is not included in a legally binding document, nor is it accompanied by concrete measures. Thus we have goals but no clear implementation options and the legal and policy world go their individual ways. All these documents have also elaborated on a number of concepts of water management including integrated water resource management (IWRM).

Today, at the global level, 1.1 billion people do not have access to potable water of which 63% live in Asia and 2.4 billion people do not have access to sanitation of which 13% live in Africa. Access to water and sanitation is thus a serious problem in the South, and that may be why the motivation to make it a global agenda item has been weak. One might argue that if the right to water is seen as a human rights issue, this would justifiy internationalizing the problem of water. Neither the Watercourses Convention nor the Water and Environmental Summits have adopted this concept, focusing instead on the non-legal concept of human needs. However, in 2002, a General Comment on the Right to Water was adopted by the Covenant on Economic, Social and Cultural Rights, the concept of the right to water has now become enshrined in law. But whether this will have mainstream effects remains to be seen.

Another argument to prioritize water at the global level is the global problem of climate change and its impacts on the global hydrological cycle. The third critical argument for globalizing water is the effect of globalization itself on water which brings me to the next section.

## THE IMPACTS OF GLOBALIZATION: A DIAGONAL APPROACH

Globalization has marketed the ideologies of growth-oriented capitalism, liberalization and privatization. In effect, this implies that the more societies invest, produce and consume the richer they will become. Growth oriented capitalism and consumerism is based on the use of more and more energy and water. The former exacerbates the climate change problem while the latter exacerbates the existing water problem. At the same time, the social, environmental and water protection agendas argue instead that there are limited resources and these resources need to be used wisely. These two messages are inconsistent.

Two points can be highlighted. The first is that the message of privatization is also being incorporated in national and regional policy. Since most private sector involvements thus far have led to a monopoly control of water in a profit-making sector, the price of water has increased. This might make water unaffordable for the poor, those targeted by the Millennium Declaration, and this fear drives critics to talk in terms of „theft from the poor" and the need to revisit the discussion on a human right to water.

The second argument is that private sector involvement, by definition, implies a legal contract often not transparent or accessible to the public. Such contracts are governed by the rules of private (international) law, bilateral investment treaties and / or free trade agreements. Furthermore, private sector involvement in the context of developing countries often comes at the cost of demanding state guarantees for the profits to be generated. Although the legal situation is not yet crystal clear, scholars argue that once countries decide to privatize and liberalize water, they may in effect lose control over the management of water; and to the extent that they try to manage this water, they may be sued in foreign courts and possibly in hard currency.

## CONCLUSION

There is a gradual convergence occurring between the three parallel processes in that some concepts are increasingly emerging as dominant in the national and regional water law developments that have been taking place in the last decade. But there are also some contradictory trends. The first trend is that while governments are seeking effective control over their water resources by designing new laws, the concepts of private sector involvement and management at river basin level is leading to an erosion of functional sovereignty over water. The second trend is that while IWRM includes the jargon of public participation in decision making, justified by the need to increase the legitimacy and effectiveness of policy, initial research shows, inter alia, that such local participation may lead to disintegration of policy and externalization of the policy interests of actors at other administrative levels.

**This paper is based on the Inaugural Address presented at UNESCO-IHE Institute for Water Education on the Occasion of World Water Day:**

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# NATIONAL ENVIRONMENTAL LEGISLATION AND THE INTERNATIONAL DIMENSION

## In Search of Legal Adaptation to Sound Regulatory Concepts [1] | By Marjan Peeters

### „LEGAL ADAPTATION", LEGAL TRANSPLANTS, AND A GROWING IUS COMMUNE

➤ **The legal entity called „the state" is still crucial for hav**ing an effective international environmental law. States are the connection between on the one hand the need for an international protection of the global commons, and, on the other hand, the real practical effects of international environmental policy. Nations must not only be willing to agree on international environmental agreements, but, subsequently, national legislators must also be prepared to implement and execute these agreements effectively in their own legal system. When new environmental problems (like the climate change problem) and new type of regulations (like emissions trading) find their place in international environmental agreements, those new developments that have to be included in the national legal systems „meet" the existing national legal frameworks, having their own, historically designed structures, principles, instruments and procedures. Especially the more developed countries already have elaborated law systems. As the world is confronted with global problems, the question arises how, and to what extent, (developed) states shall show flexibility in adjusting or altering their national law systems in order to implement and enforce international environmental agreements. In order to acquire more understanding of the effectiveness of international environmental law, it is necessary to identify which national cultural legal barriers for implementing the international provisions can be found, and how these barriers can be overcome. In this context, the concept of „legal adaptation", meaning that national legal systems need to be adjusted to the content of international environmental agreements, deserves attention. National legal cultural elements might hinder the process of adaptation to international provisions. Legal adaptation can concern several elements of the legal system, like institutions (the order and content of competences), principles, regulatory instruments, procedures, enforcement provisions, or private law provisions.

In the process of adaptation, so-called legal transplants can be part of the process. A legal transplant is a legal provision borrowed from another legal sphere. Legal transplants possibly occur as the result of comparative examination of two or more legal systems, aimed at finding attractable improvements of the legal system. Legal transplants can happen horizontally, between states, or vertically, between nations and international agreements or institutions, in a bottom-up direction or vice versa.[2] Of course, one has to consider carefully whether it makes sense to transpose a legal instrument from one system into another system with other characteristics.

After the process of adaptation, possibly including legal transplants, fewer differences will remain between the several national frameworks. In other words, international environmental agreements (and comparative legal research) lead to a certain extent of harmonization between national legal environmental frameworks. To some extent a certain *ius commune* of environmental law seems to be the result of this process. From an ideal point of view, this *ius commune* would include the most important and sound concepts of regulating environmental behaviour.

### REGULATORY CULTURES AND LEGAL COMPARATIVE RESEARCH

In the ongoing process of internationalization of environmental policy, a great deal of attention is and will be paid to the use of legislative instruments. Among other policy strategies, nations still use regulatory tools as a basic strategy for reaching (international) environmental policy goals. On the basis of legislation, prohibitions and sanctions can be imposed on citizens and firms. Financial duties, like environmental taxes, also need a legislative base. Furthermore, without a legal prohibition that no pollution may be caused without an emission right, emissions trading could not work. The choice and design of regulatory instruments seem to be closely related to the specific legal culture and political atmosphere of a country. The question what general criteria for legislation and particular criteria for environmental legislation exist in various nations, and how they are applied (and with what results) fits well in the agenda for legal comparative research. In addition, similar comparative research should be done on the evolving concept of „good governance." In the EU for example, this concept receives increasing attention.[3] Governance relates mainly to „openness, participation, accountability, effectiveness and coherence".[4]

### THE NEED FOR COHERENCY AND INTEGRATION OF ENVIRONMENTAL RULES

„Coherency" is thus mentioned as one of the conditions for (European) governance. Moreover, it can be argued in general that *environmental* regulatory measures must be part of a coherent legal network, aiming at an integrated regulatory approach with regard to polluting behaviour.[5] Coherency and – where possible – integration could be seen as particular criteria for environmental legislation, which the different levels of governance should take into account.

The motive for integration is not primarily a legal one: an integrative approach is ought to be suitable to the ecological unity of the environment. A sectional or fragmented approach would deny the ecological concept of connection, and could result in transpositions of pollution from one compartment (like water) to another (like air or soil).[6] With a fragmented approach, undesirable synergetic effects between substances could occur.[7]

From an economical point of view, an integrative approach seems also favourable as it allows a full internalization of environmental costs.[8] Additionally, the administrative costs of an integrated approach are supposed to be lower, both for government as for industry. For example, instead of permit-systems for

several compartments (soil, water, air, etc.), just one integrated permit is needed.

The strive for integration can include a desire for more freedom of decision for industry, in order to let them examine – through a complete assessment of their activities – what measures would fit best and would lead to the most efficient way of preventing environmental damage. For a real integrative approach, this integrative assessment should also address the efficient use of raw materials, or even the environmental effects of collecting the raw materials.[9] A very broad integrative assessment would include a discussion of the environmental effects of the product itself.[10]

It can be assumed that there are pragmatic limits to the ideal of integration.[11] It could be overly complex to integrate every environmental aspect into one decision. In addition, the use of integrative assessments can probably lead to undesirably long procedures for administrative decisions. The possibilities and limits of integration are still not fully clear, and more research has to be done. In addition, where a full integration would not be suitable, the possibility of co-ordination and harmonization can be examined. In this respect, the coherency of environmental law might be increased by harmonization, co-ordination and integration.[12,13]

## INTEGRATED ENVIRONMENTAL LAW IN PRACTICE

For instance in the Netherlands, the striving for an integrated environmental law is one of the main (cultural) topics in the debate on environmental legislation. This debate started with a discussion on harmonization in the seventies. An important step was the entry into force of the Environmental Management Act in 1993, aiming at an integrative approach in environmental policy. The creation of a fully integrated environmental legislative framework (or: an Environmental Code) seems however to be a rather difficult task. Besides the Environmental Management Act, some sector-oriented laws still exist, regulating specific compartments of the environment (like water and soil), or particular environmental problems (like dangerous substances).

Within the European Union, the quest for integration of environmental law seems to be less intense. On the European level a tendency can be seen towards so-called framework directives, aimed at integration of several rules concerning one particular environmental element (like waste, water, air, or chemical substances). Nevertheless, some very important developments towards integration have occurred: for major installations, an integrated permit system is included in the directive 96/61 concerning integrated pollution prevention and control.[14] In addition, some provisions relevant for the whole environmental policy area are enacted, like environmental impact assessment, and access to environmental information.

At the international level, there is a rather fragmentary collection of environmental agreements between varying Treaty-parties. At this level, a coherent systematic approach seems absent.

## A CASE STUDY: IMPLEMENTING EMISSIONS TRADING INTO A NATIONAL ENVIRONMENTAL LAW SYSTEM BASED ON INTEGRATION

Climate change and emissions trading are closely connected. Literature and experiences in the USA indicate that the emissions trading concept can be a useful instrument for non-local environmental problems. The emissions trading instrument can be seen as a „legal transplant": it originated in the environmental law of the Clean Air Act of the USA, and was already internationally adopted in the agreements for protecting the ozone layer.[15] The Kyoto Protocol includes international, interstate emissions trading, and two project based mechanisms derived from the theoretical emissions trading concept. Meanwhile, it is striking how fast the emissions trading concept has been accepted as one of the instruments for climate change policy within the EU. The emissions trading directive for greenhouse gases is ready, and has to be implemented by the Member States in their legal systems in a very limited time-schedule. In fact we can see that an amazingly quick transplantation of the concept of emissions trading will take place. Especially in the Netherlands the question arises how emissions trading should be fitted into the striving for a coherent or even integrated environmental law. With an approach followed by subsequent legislators aimed at harmonization and integration (combined with goals of deregulation), emissions trading means a radical new dimension in the environmental law of the Netherlands. For the national law system of the Netherlands, we must conclude that the (national) striving for integration cannot be strongly upheld for the (international regulatory choices for) greenhouse gases. We can see that – for the moment – the market-based attractiveness of the internationally accepted instrument of emissions trading prevails over the more holistic concept of integration. This development is an interesting example of a current adaptation of a national legal system towards a new tendency of international law.

## COHERENCY AND CHOICE OF INSTRUMENTS: IN SEARCH FOR SOUND CONCEPTS AND EMPIRICAL RESULTS

On the international level, the striving for maximum coherence of international environmental standards and procedures will continue to be a challenge. In this respect, more insights have to be gained into the ambition of integration balanced against the preference for a mix of instruments. This relationship or even tension between on the one hand the striving for coherency and integration, and, on the other hand, the choice between instruments, needs further elaboration. Coherency must not be reached at any price, but must really make sense. Integration must be balanced against the wish to use the most suitable regulatory instrument for every type of problem. Maybe we should try to learn bottom-up: empirical research on both sectional and integrated national environmental law-systems can show us how workable they are, and what the costs of regulation are.[16] From these examinations, sound regulatory concepts might be derived that could subsequently be considered within other international or national legal frameworks.

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References to this article are included on the IHDP website at www.ihdp.org/updatelaw04/references.htm

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# TRADITIONAL ECOLOGICAL KNOWLEDGE AND INTELLECTUAL PROPERTY RIGHTS

## EXPROPRIATION OR PROTECTION?

By Merrilyn Wasson

### INTRODUCTION: THE NATURE AND VALUE OF TRADITIONAL ECOLOGICAL KNOWLEDGE

➤ **From the perspective of traditional and indigenous** people throughout the world, it is knowledge of specific ecosystems and biota that defines and legitimates the boundaries of their physical ownership over an area of land, or of coast and adjacent sea, known as the communal domain (Baker, 1999; Wells and Edridge, 2001). As a consequence, any regime or policy that devalues the status of a community's traditional ecological knowledge (TEK) is likely to undermine the basis of the community's right to domain and to resource use within it.

**It is the nexus between traditional knowledge and communal property ownership which has resulted in the right of traditional and indigenous people to ownership of their knowledge systems becoming one of the most controversial ethical and legal issues of global environmental governance.**

The United Nations World Intellectual Property Organisation (WIPO) summarises the situation in these terms:

*Indigenous knowledge is threatened by the loss of the Indigenous peoples' territorial base. This makes it impossible for many indigenous communities to sustain their knowledge base.*

*Indigenous knowledge is increasingly endangered by the misappropriation of this knowledge by outside researchers (WIPO 1999).*

TEK is not static, but accumulates, adapts and changes through prolonged familiarity with the dynamic ecosystems and biota of the communal domain (Akimichi, 1991; South et al., 1994). An international Intellectual Property regime (IP), which acknowledges the dynamic nature and worth of traditional ecological and ethno-biological knowledge as IP is essential if traditional communities are to profit directly from any commercialization of their knowledge systems. With caveats, the benefit to the environment is an increase in the capacity of traditional and indigenous communities to maintain, rehabilitate and sustain the ecosystems of their communal domain.

### INTERNATIONAL INSTITUTIONS AND THE EXPROPRIATION OF TRADITIONAL ECOLOGICAL KNOWLEDGE

It is precisely because traditional ecological and ethnobiological knowledge is a guide to the biota that are likely to be of value in medicine or genetic biotechnology, that the possessors of that knowledge have become enmeshed in the debates over IP regimes and genetic resource ownership (Wells and Eldridge, 2001)

It is the institutional interplay of two regimes, the Convention on Biodiversity, 1994 and the WTO's Agreement on Trade Related Aspects of Intellectual Property (TRIPS) 1995, and a global phenomenon – the commercialization of knowledge – which is driving the misappropriation of TEK (Adhury, 2001).

TRIPS requires Intellectual Property protection for genetic resource use innovation, a requirement that stems from the TRIPS Agreement as a whole and from one specific article (Art 27 3 b) which is open to varying interpretations (Tejera, 1999). ).

Article 15 of the Convention on Biodiversity (CBD) recognizes the sovereign right of states over their own genetic resources and institutes equitable benefit sharing arrangements between owner and the users of those genetic resources. Article 16 mandates that part of equitable benefit sharing shall be the transfer of biotechnology, from user of the genetic resources to the supplier. The transfer of patented biotechnology from user to supplier of the genetic resources does contradict the patent and IP laws of the US and other IP exporting nations (Weismann, 1996).

Equity considerations have dominated the dispute over the provisions of the two regimes, since most suppliers of genetic resources are biota rich but impoverished developing nations, while the IP exporting nations are five of the wealthiest economic and technological powers (Bass, 2002; Cahill, 2001). A current estimate is that over 75% of all patents based on biological resources that originate from the Asia Pacific are owned by OECD nations outside the region (Wells and Eldridge, 2001)

At the Doha Conference of the WTO member states in November, 2001, India and Malaysia led the G77 group of developing nations in forcing changes to TRIPS. The G77 demanded a review of the entirety of the TRIPS regime and required the WTO to rewrite Article 27 3 b of TRIPS ' *to be supportive of, and not run counter to the provisions of the CBD*' (Bass, 2002).

Moreover, a resolution was put to the WTO to include in TRIPS a mandatory requirement that all products based on genetic resources must state the place of origin of the genetic resources used and whether consent was obtained.

### THE INADEQUACY OF THE CONVENTION ON BIODIVERSITY REGIME FOR THE PROTECTION OF TRADITIONAL ECOLOGICAL KNOWLEDGE

With the uncertainties surrounding the TRIPS agreement in relation to genetic resource ownership since Doha, the impact of the Convention on Biodiversity on traditional ecological knowledge is coming under scrutiny.

Initial research was appreciative of Article 8j of the CBD as an attempt to value traditional ecological knowledge. Article8j states that each contracting party shall.... *Subject to its national legislation, respect, preserve and maintain knowl-*

*edge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of the biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage equitable sharing of the benefits arising from the utilization of that knowledge, innovation and practices.*

Contrasted with Western concepts of Intellectual Property, which consign accumulated and shared traditional knowledge to 'prior art' and therefore open to expropriation, this provision appears to offer some protection for traditional knowledge. Yet there are three aspects of Article 8j which make it an inadequate regime for these purposes.

Firstly, it is entirely in the power of the nation state whether to enact Article 8j.

The primary interest of the G77 is in ensuring national sovereignty over genetic resources. In all nations, developed and developing, legal acknowledgment of traditional knowledge, which is used in the production of biotechnological and prophylactic health products, is conspicuously absent and the extent of expropriation of that knowledge is egregious (Blakeney 2001, Carhill 2001, WIPO 2002).

Secondly, in asking only for equitable benefit sharing for traditional knowledge, Article 8j circumvents the necessity to accept that traditional knowledge is the *intellectual property* of the community that generated it. In addition, what is 'equitable' between the genetic resource user, the nation of genetic resource origin and indigenous providers of relevant knowledge, is left undefined (Carhill 2001).

Thirdly, Article 8j values the resource rights of indigenous people only if they meet conservation criteria. Traditional ecological knowledge, like all traditional knowledge is evolving. As it must adapt to dynamic ecosystem change, there will be circumstances when the knowledge and practice will be inadequate to prevent ecosystem deterioration, when measured against sustainablility and conservation criteria (WIPO 2002).

## KNOWLEDGE COMMERCIALIZATION AND THE AMBIVALENCE OF DEVELOPING NATIONS TOWARD TRADITIONAL ECOLOGICAL KNOWLEDGE

The core problem for traditional ecological knowledge is that it is currently up to national governments to ensure some *sui generis* legal acknowledgment of indigenous rights to their ethno-biological knowledge systems.

Two contradictory responses are evident in the reaction of governments to the commercialization of knowledge to their biodiversity and to traditional knowledge systems. This ambivalence results in a simultaneous increase in national legislation seeking to control biopiracy on the one hand, and Memorandums of Understanding with pharmaceutical and biotechnological companies for access and research on the other (Cahill, 2001; Kate and Laird, 1999).

The reason for the ambivalence is straightforward. In the Asia Pacific region, for example, there are a block of nations who are developing biotechnological and pharmaceutical industries based on their national biota and genetic resources. Hence the desire for assistance with research and development from OECD pharmaceutical and biotechnological companies

***Harvesting seaweed species used for medicinal, cosmetic and nutritional purposes, coastal community, Kupang, Indonesia***

on the one hand, and a desire to control access to their territorial genetic resources on the other. (Wells and Eldrige 2001).

However, India has adopted a different strategy. India either legally challenges alien Intellectual Property claims over expropriated endemic biota and traditional ethno biological knowledge, or simply ignores those claims. It is also the most legislatively active nation in protecting its traditional knowledge.

How extensive is the expropriation of traditional knowledge by the commercial enterprises using alien IP regimes?

In the case of herbal and other prophylactic products, the expropriation of traditional knowledge from the Asia Pacific region has reached staggering proportions. Whole systems of knowledge, such as Ayurvedic medicine from India and Jamu medicines from Indonesia, as well as herbal treatments from countries as disparate as Bhutan and Vietnam are becoming the subject of US, Japanese or UK patents. (Cahill 2001)

The companies whose expropriation is the most subtle are the cosmetic companies. Exploiting a drive to use 'natural products' that is a tangential effect of concern for the environment, the cosmetic companies have become expropriators of biota as well as traditional knowledge from the Asia Pacific.

1) Annual global sales of products derived from genetic resources have now reached circa US $800 billion. The expropriation of traditional knowledge has been invaluable in providing leads as to which products contain natural anaesthetics, hallucogenics, anti-pollution agents and poisons to species other than humans (Kate and Laird, 1999)
2) Sales of herbal and other prophylactic products have now reached US$30 billion per annum (Drahos and Braithwaite, 2002)
3) Sales of cosmetics that use natural products are incalculable (Drahos and Braithwaite, 2002)

## SOLUTIONS: A REPRESENTATIVE INTERNATIONAL INTELLECTUAL PROPERTY REGIME AND *SUI GENERIS* LEGISLATION

The controversy that ignited as a consequence of the conflict between TRIPS and the CBD over ownership of genetic resources has been super-ceded by controversy over the commercialization of knowledge and the expropriation of traditional ecological knowledge. Resting as it does on a form of property right, Intellectual Property, the commercialization of knowledge has resulted in the expropriation of traditional

knowledge over biodiversity, as a source of medicine, health and cosmetics. Increasingly, lawyers are accepting that where traditional knowledge either leads researchers to biota with potential for pharmaceutical drugs, biotechnology, herbal remedies or cosmetics, it should be treated as IP (Blakeney 1997).

Coming at a time when the nexus between traditional knowledge = indigenous ownership of resources and ecosystems = indigenous conservation ethics and practice are breaking down, the exploitative nature of the commercialization of knowledge has not been helpful, so far. But since institutions of the commercialization of knowledge appreciate and use, but do not pay for, TEK, there are avenues opening by which the indigenous innovators of that knowledge may circumvent both expropriation by commerce and the uncertainties of national 'equitable benefit sharing'.

The critical measure is to have TEK defined as a patentable IP right. At the international level, it will mean the modification to an existing regime, which clearly states that traditional knowledge to biota and ecosystems is an internationally recognized IP right, or the negotiation of a new and representative international IP regime At the national level it will require *sui generis* law to the effect that traditional ecological knowledge is Intellectual Property, especially in developing nations rich in both indigenous knowledge and biodiversity.

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# RULES WITHOUT ENFORCEMENT ARE BUT WORDS ON PAPER

BY ELINOR OSTROM

➤ **Over the past three decades, substantial research has** been conducted by anthropologists, economists, engineers, geographers, historians, political scientists, psychologists, and sociologists on institutions as a key link between social systems and the ecological systems they use. A key lesson acquired from in-depth analyses of the research record is that no single set of rules is equally effective in governing all common-pool resources. An equally important lesson is that formal rules that are not monitored and enforced by someone – the participants, officials, or both – are ineffective and do not change behavior that adversely affects ecological systems. Further lessons are summarized in literature cited in the footnotes, but limited space necessitates a focus on only two of the core findings. These two lessons are particularly important given various policy proposals currently under discussion[1].

## THE LACK OF EFFECTIVE, GENERAL-PURPOSE BLUEPRINTS

The diversity and complexity of ecological resources are immense. Ecological systems also differ greatly in spatial extent. If an institutional arrangement is to enable humans to utilize or protect a resource sustainably over the long run, especially in changing environments, rules must be well tailored to the attributes of the particular resource involved. The question of „fit" is a central theme of the IDGEC Research program, which has demonstrated the diversity of institutions at multiple scales. The types of rules that will work effectively in managing a groundwater basin, for example, may not work well in a multispecies fishery. In fact, the specific kinds of rules that will work well in one groundwater basin are not guaranteed to work well in another groundwater basin with different rainfall pattern, spatial extent, economic use, and the culture of the individuals using it. Similarly, rules that work well related to inshore fisheries are unlikely to be effective in regulating the use of ocean fisheries. Successful agropastoral systems located in semi-arid regions are not likely to work as effectively in desert or tropical environments[2].

When scholars, officials, and donors have identified a successful, linked social-ecological system, whether deduced from a theoretical model or in the field, the temptation often exists to make a recommendation of adopting it as a universal, blueprint solution. Some advocates propose that a centralized government agency solve all ecological problems within an entire nation. Others recommend decentralized solutions, but many of these involve applications of top-down „solutions" rather than assigning local groups substantial autonomy within a system of larger governance units[3].

When colleagues and I conducted a study of irrigation systems in the plains of Nepal, for example, we were amazed to find that a donor providing modest funding had required irrigators of over 50 different irrigation systems to adopt a standard set of rules. The single blueprint was prescribed without regard to whether the irrigators had been organized for a long time using different rules, whether they were composed of 25, 250, or 2,500 households, or the abundance of available water. The blueprint stipulated that the rules could be changed only if the farmers on a system unanimously approved a change. Unanimity! Institutional analysts have long identified the undesirable consequences of authorizing either a one-person rule or absolute unanimity – both allow a very small minority to extract unfair advantages from others[4].

In contrast to the effort by external authorities to impose uniform rules, scholars repeatedly have documented the multiplicity of rules used by farmer-organized irrigation systems in Nepal (and elsewhere) and the higher performance achieved by many of these systems when compared to donor-financed,

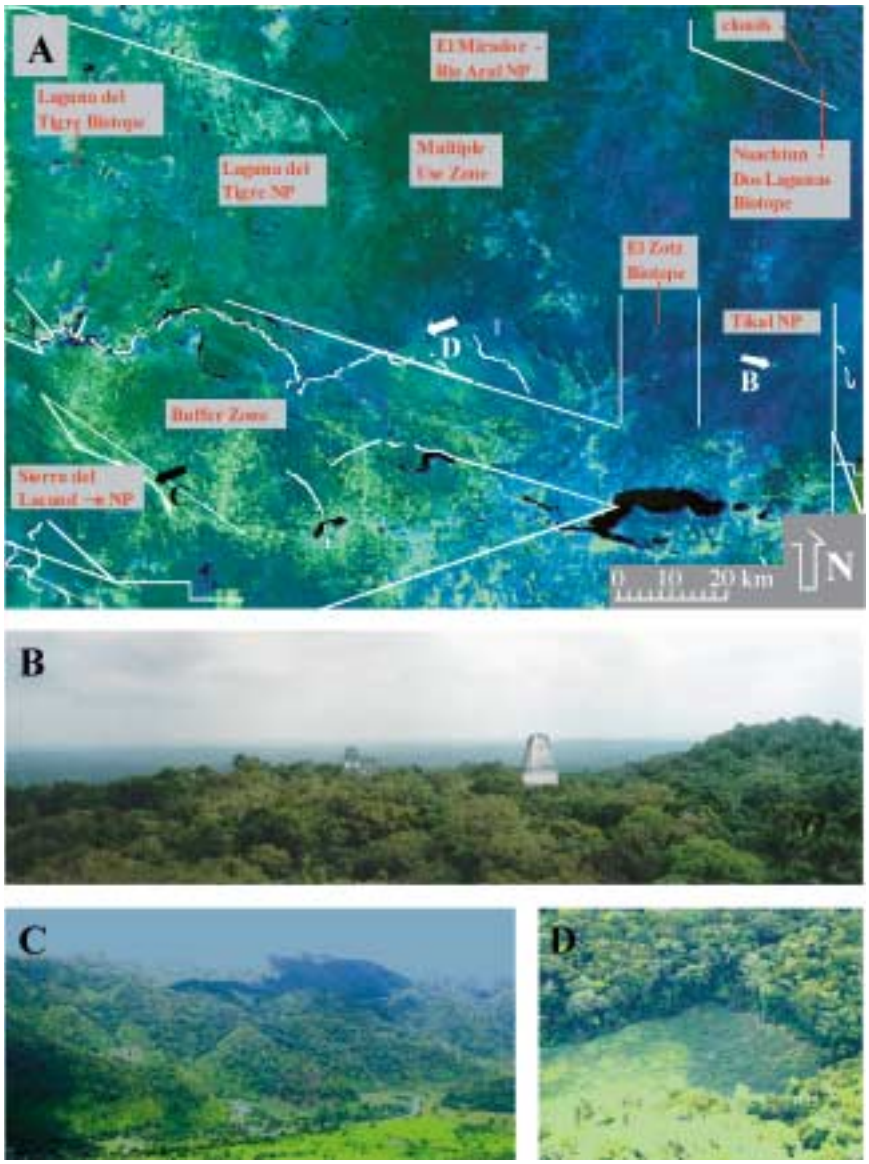


*Figure 1*

***A multitemporal color composite of the seven protected areas (national parks and biotopes) and multiple use and buffer zones in the Maya Biosphere Reserve in northern Guatemala (from the Online Supplement to Dietz et al., 2003, Science 302:1907). Tikal National Park has been monitored effectively, and the forest cover is stable (evidenced by the uniform dark color). Two other northern areas are also stable, due to their inaccessibility. The other four protected areas have experienced substantial illegal logging, conversion to agriculture, and other uses (evidenced by the extensive inroads shown in red and yellow). Official designation as a Biosphere Reserve is not sufficient to protect biodiversity unless substantial investments are made in maintaining and enforcing boundaries.***

agency-managed systems. Farmers with the autonomy to change rules in light of learning from experience appear to fit their rules to relevant ecological systems. Water allocation rules, for example, tend to be adapted to differences in rainfall in regions with sizeable rainfall variation[5].

In the water-deficit months, for example, only 1 of 88 systems sampled in a low-elevation district of Nepal allowed a free flow of water in the canals, while 38 (43%) of the 88 switched to authorize free flow during the water surplus time of year. Using another rule, 79 systems (90%) rotated water among farmers' fields, but only 5 (6%) used a rotation rule during the water-surplus time of the year. In contrast, over half of the 160 systems sampled in the middle hills of Nepal (where water is not as abundant) allocated water using a strict rotation system the entire year[6].

The number of variables identified by scholars as potentially affecting the capabilities of individuals to design sustainable institutions far exceeds simply the amount and timing of rainfall. In addition, slope, aspect, type of soils, number of species involved and their trophic levels, predictability, size, and location in relationship to urban and economic centers are among the most frequently mentioned biophysical factors affecting institutional performance. The diversity of systems is compounded by the large number of users' attributes, including their number, location in space, type of leadership present if any, levels of trust, past history, and heterogeneity in regard to economic assets, social connectedness, ethnicity, etc.[7].

The central lesson of this extensive body of research is, however, not to replace „one size fits all" with either „anything goes" or „any size fits any"[8]. Rather the core finding is that advocacy for either specific rules (e.g., the universal optimality of Individual Transferable Quotas (ITQs) for fisheries) or broad abstractions (e.g., centralization, privatization, or decentralization) actually can be the problem rather than the solution. Nor is the central lesson that resource users left alone will always develop well-matched rules that sustain ecological systems. We need to recognize that crafting and modifying effective social institutions is closer to an evolutionary process than a top-down, engineering design process. Social institutions evolve as humans build on existing structures of rules to add rules regarding some activity, modify others, and drop others. Rarely are resource users or government officials able to create an entire set of rules in their first effort to organize so as to sustain a resource over time. Also, the temptation to avoid paying the costs of joint efforts or to seek excessive power or benefits is always present at all levels of human organization and may come to dominate when information is not generally available about processes used and performance achieved.

Institutions themselves provide information and incentives that shape behavior leading to improving or to worsening conditions. Many current environmental challenges require substantial institutional innovation. We face local problems with global causes (e.g., deforestation to meet global market demand), global problems with local causes (e.g., stratospheric ozone depletion traced to chlorofluorocarbons produced at only a handful of sites), and global problems with global causes (e.g., carbon dioxide emissions from fossil fuel consumption). In each case, the information and incentives provided locally may be incongruent with environmental consequences. Similarly, highly aggregated information may average out meaningful local variations that provide important clues to future problems. Thus, providing information that matches the processes occurring at multiple scales is essential, but many ways exist to accomplish this. Unfortunately, many planners do not even think about the need to generate accurate information about actions taken and outcomes affected.

### THE LACK OF ENFORCEMENT

A second major lesson learned from more than three decades of research is that simply passing a law or writing a treaty is not the equivalent of creating an effective institution. Scholars have documented the existence of many paper parks where the boundaries are drawn on an official map in some distant city without the local population knowing that a park had even been created. While this lesson seems obvious to many, it frequently has not been used in the design of institutions for protecting valuable ecological resources[9].

Effective national parks do indeed exist where boundaries are clearly demarked and enforced. A multitemporal color composite derived from satellite images for 1986, 1993, and 2000 portrays seven protected areas located in the Maya Biosphere Reserve in Guatemala (see Figure 1). The uniform dark color within three of the areas – Tikal National Park, El Mirador Rio Azul National Park, and Naachtun Dos Lagunas Biotope-represents stable forest, with minimal deforestation during this 14-year period. In contrast, four of the protected areas-Laguna del Tigre Biotope, Laguna del Tigre National Park, El Zotz Biotope, and Sierra del Lacandón National Park – have been heavily impacted as illustrated by the extensive recent incursions (the red areas) and earlier incursions where forest has not regrown (yellow areas)[10].

Tikal National Park was created in 1955 and declared a UNESCO World Heritage Site in 1979 due to its unusual biological characteristic and unique archaeological treasures. Tikal receives substantial revenues from entrance fees, which cover the entire park budget and enable employment of a large staff, including a substantial number of guards. The fees also generate a hefty annual surplus that is sent to the national government. Thus, the park can afford to monitor and enforce its boundaries, and the government is highly motivated to hold park officials accountable for protecting this forest. If the guards were not effective and forest cover was lost, government officials would lose a major source of revenue.

The two other stable areas – El Mirador National Park and Naachtun Dos Lagunas Biotope – are protected due to their inaccessibility rather than rule enforcement. Neither of these protected areas can be reached by road, and traveling there by foot or horseback takes three to five days. Thus, only one of the seven protected areas is actually protected by the rules written to safeguard them.

The official purpose of all seven national parks and biotopes is to be completely protected from human intervention, aside from research and low-impact tourism. As can be seen from the extensive red and yellow inroads in Figure 1, it has been difficult to restrain human encroachment within four out of the seven protected areas. New settlements, agriculture, plantations, oil drilling, forest fires, and illegal drug trafficking all threaten four of the protected zones even though their formal rules are similar to those of Tikal National Park. Government officials do not allocate major budgetary support to the other parks and biotopes, nor is there a major effort to control immigration and land-use conversion. A small group of underpaid park rangers are unable to enforce the paper rules, and major incursions are occurring at a rapid pace.

➤➤➤ The urgency of developing a better scientific foundation for the fit of institutional arrangements to the particular ecological problem under consideration is highlighted by a major article in Nature. Using several global data sources to calculate the distribution of species around the world, the researchers asked how many endangered species are covered by protected areas (PAs). They compared maps of over 100,000 PAs in the world with maps of over 11,633 threatened species. Any threatened species that had at least part of its geographic range in a region overlapping a PA was considered „covered." They reported that 1,424 species were not covered to any extent by any PA and that the amphibians were the most likely to be outside the range of a protected area[11].

The authors then urged an expansion of the PA network to include all of the endangered species and the creation of more PAs in tropical areas where a larger proportion of endangered species exists. While the protection of endangered species in the world today is certainly laudable, the researchers – like many others making sweeping institutional proposals – turned to a single blueprint solution for the problem they had identified. Further, they did not face the fact that there are many more unprotected species than they measured, since many protected areas, like the four shown in Figure 1, are officially designated as protected areas but are not effectively monitored and thus are unprotected in actuality.

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# SUCCESSFUL IMPLEMENTATION IS INNOVATIVE

## Interview with John Scanlon

➤ **John Scanlon is Head of the Environmental Law Programme (ELP) and Director of the Environmental Law Centre in Bonn, Germany. The ELP is a programme of IUCN – The World Conservation Union. It plays a crucial role in the development and implementation of the world's international environmental conventions.**

*Q: What can you tell us about the Environmental Law Programme?*

Let me start with the World Conservation Union (IUCN) of which the ELP is a part. The IUCN is an open, democratically-based organization whose members are from governments as well as from non-governmental organizations. The IUCN Secretariat consists of the main office situated in Switzerland and a number of global programmes as well as country and regional offices. One of IUCN's global programmes is the Environmental Law Programme which was created in the 1960s. The ELP is based in Bonn, Germany, at the Environmental Law Centre.

In addition to IUCN's Secretariat we have six volunteer commissions that have been created by our members. The Commission on Environmental Law (CEL) is one of them. It has over 950 members from 138 countries and a steering committee that represents all regions around the world. CEL is a volunteer network of experts who work with IUCN and, in particular, with the Environmental Law Centre, to deliver its Environmental Law Programme.

*Q: Who are your partners?*

Our partners at international level comprise many UN institutions, in particular UNEP and FAO. A joint initiative with them is the ECOLEX data system, the „Gateway to Environmental Law". We also have many partners at regional, national and local levels. In addition, we have set up a global network of collaborating centres, called „partner centres". There are now 13 of these centres in 11 countries, mostly based at the law faculties of universities. Institutional partners include the Environmental Law Institute in Washington D.C. The underlining philosophy of the Environmental Law Programme is to be a very strong global network and to work in partnership with others to add value to our work and to lead in areas where leadership is needed.

*Q: How would you describe your work?*

Our work has evolved over the past decades. Initially, the „cutting edge", the new and innovative legal thinking needed to be developed and then put down in conventions. A lot of that happened through our programme and that is where the ELP made its name. While this work is still going on, the brief has expanded. Implementation has become increasingly important. Therefore, capacity building and also legal research on environmental law & policy is important now. We do a lot in that regard and have developed a capacity building matrix that sets out the capacity building needs in the context of environmental law and policy. Both areas, capacity building and research, are being developed in close collaboration with over 50 participating universities – this network has been created by our Commission and is called the IUCN Academy of Environmental Law.

*John Scanlon*

*Q: Can you give some examples of your current work programmes?*

A strong focus at the moment is energy. We have an excellent network of specialists working with our centre here. They look at how to reform legal instruments in order to make the shift towards sustainable energy happen, including which international laws are in any way limiting the opportunity to promote renewable energies. The legal work comprises research and promotion of policy change. In particular we look at it from a biodiversity conservation perspective – how can you meet energy needs without having such a great impact on biodiversity, and on the environment in general. We are also doing work in relation to climate change through this network. We look at practical issues. For example, if you are going to look at carbon sinks and trade in carbon, how do you actually acknowledge and recognize legal title to carbon.

*Q: What are examples of your „cutting edge" work?*

In the early years of the programme, the ELP has been instrumental in the development of a number of international conventions that today set a lot of the governments' frameworks. I'm referring to the Convention on Migratory Species, the World Heritage Convention and then more recently to the one on Biological Diversity. A draft was worked through the Secretariat and the Commission. So, key international instruments on environmental issues had a lot of their early thinking and drive coming through this programme.

Quite an interesting convention is the Africa Convention which goes back to the 1960s and first emerged through the ELP's work with African counterparts. This convention was revised over the past five years, drawing upon the technical expertise of the ELP and UNEP, and it is now open for ratification. The initial Africa Convention was ahead of its time, and so is the revised one. Providing technical assistance to both processes shows a continuity in our work.

Another important example of our „cutting edge" work is the draft „International Covenant on Environment and Development". This draft convention deals with all environmental issues – biodiversity, water, energy etc. It remains a draft and will probably never be adopted. However, it is seen as a valuable instrument that guides people in their thinking about where international environmental law finds itself at the moment and where it could be heading.

*Q: These international conventions have been adopted but implementation at country level remains a problem. Do you cooperate with governments in order to improve this situation?*

We work on the implementation of conventions including the synergies between conventions. Each convention is its own legal instrument and has its own processes and one convention cannot require another convention to do something else. If you look at the domestic context, for example here in Germany, there are many laws dealing with different aspects of the environment that may not be well coordinated. The parliament can then amend these or appeal them. There is the capacity at a national level to deal with your own laws and try and get things done. There is no equivalent at an international level, there is no international parliament that can decide on amending these conventions. They are all individual legal instruments answerable to their parties to that convention.

But we have to find effective ways of looking at them collectively. What are we trying to achieve through all of this, how do we get synergies which will make implementation more practicable? The true test of success is resolved on-ground. One officer of our secretariat here in Bonn has been working on how to achieve synergies between CITES (The Convention on International Trade in Endangered Species) and the Convention on Biological Diversity, for example. And we have worked with many governments to assist them in developing legislation to give effect to these conventions.

We help to build capacity of countries in two ways. At the international level, with regard to the Climate Change Convention and the Kyoto Protocol, we are working with countries from South America, Africa and Asia. We work with the countries' delegates to the conferences of the parties and other meetings in order to build their capacity so that they can negotiate more effectively and can make informed policy choices.

Then, we are also doing a lot of work at the national level to help build domestic capacity. With regard to the Cartagena Protocol on Biosafety we have developed, with partners, a guide to that Protocol to assist national governments to implement biosafety regulations at a national level. We realized that a guide was not enough. To build capacity, you have to work people through this guide. We are now looking at training trainers – people that can actually take on the role of building capacity. We did a very good programme at the National University of Singapore training 70 trainers for Asia on environmental law. So, building necessary capacity for implementation but also connecting policy to practice has been an increasing work area over the past years.

*Q: The practical approach has become ever more important. In the past, international processes used to be 'top-down' and did not have much to do with the real life 'down there'.*

I agree. You can also see this in the evolution of the ELP's work programmes. Initially, new instruments had to be developed and innovative thinking was important. While this is still a necessary trait of our work, we now have to look more at implementation. I think it's a mistake to see innovation as new instruments or big global ideas only. How do you effectively implement these instruments and how do you achieve on-ground change? How do you engage with the local community? This is where we are taking a much broader view on innovation. It requires a lot of conceptual thinking.

*Q: Can you talk about access and benefit sharing?*

We have a large programme on this. The emphasis is on the benefit sharing side. The principle of access and benefit sharing is based on the Convention on Biological Diversity. We are looking into what has been tried and tested at the national level. Are things working or not working? What are the obstacles to achieving a regime which in theory sounds excellent? If you think philosophically, it is easy to accept that you should not obtain access to a genetic resource without prior informed consent and that the benefits should be shared amongst those who are the custodians of that resource. But how do you actually make that a reality with the genetic resource existing in more than one country? And how does contract law apply to this idea of access and benefit sharing? Do normal contractual principles apply or do they not easily fit? How do you fit it within a national legislative context and are the examples that are being tried working? Are they actually working to distribute the benefits as the principle intends? The work on all that is going on. One of the difficulties is: how to get access to contracts? Ultimately, the contracts between a commercial body and those holding a resource set out how the benefits are identified and shared. But to obtain access to contracts is difficult because they are regarded as confidential.

So, part of the project is not only looking at the instruments and speaking to people who may be the custodian of the resource but also to look at engaging with the private sector and to speak with those who are seeking to gain access to the resource. From our perspective, engaging with the private sector is a critical part of our business. We're not going to achieve our goals without this.

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The Webpage of the ELP is: **www.iucn.org/themes/law/**

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INTERVIEW BY ULA LÖW

# TOWARDS A PRECAUTIONARY INTERNATIONAL LAW

## About Uncertainty, Interdependence and Anticipation in Global Environmental Governance

By Makane Moïse Mbengue

➤ **Precaution starts from the premise that the absence of** scientific certainty should not be used as a pretext to postpone decisions if there is a risk of serious or irreversible damage to the environment. Precaution is a key concept in international sustainable development law. The 1992 Rio Declaration on Environment and Development has had a pioneering role in the process of the crystallization of the concept of precaution in international law. Its Principle 15 stipulates:

*In order to protect the environment, the precautionary approach shall be widely applied by 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.*

Precaution favors the emergence of paradigms which support the development of the legal aspects of global environmental governance. The most important ones of these are uncertainty, interdependence and anticipation. Precaution influences the philosophy of law in its entirety and a new kind of international law is thus being created.

### REGULATING UNCERTAINTY

Precautionary thinking appeared with concerns over the regulation of uncertain ecological phenomena. International law has been based for a long time on the dogmas of Cartesian rationality. As a result only those phenomena which were enjoying a certain scientific certainty were covered by international regulation. Precaution challenges Descartes' famous aphorism cogito ergo sum (I am thinking therefore I exist) by replacing it de facto with dubito ergo sum (I doubt therefore I exist).

When the Vienna Convention for the Protection of the Ozone Layer was adopted in 1985, the extent and the nature of the human impact on the ozone layer were largely shrouded in uncertainty[1]. In the same vein, scientific uncertainty was widely prevalent in 1992 when two of the key multilateral environmental conventions were opened for signature in Rio, namely the UN Framework Convention on Climate Change and the Convention on Biological Diversity. At that time, little was known about nature and the seriousness of human activities' impacts like greenhouse gases, on climate systems[2] or on biological diversity[3]. Furthermore, one could mention the Cartagena Protocol on Biosafety which was adopted in 2000 at a time of major scientific uncertainties regarding the risks of genetically modified organisms for the environment and public health, and which in fact persist after its entry into force in 2003[4].

### INTERNATIONAL LAW AND THE CHALLENGE OF INTERDEPENDENCE

A precautionary attitude emphasizes the interconnections and intersectoral aspects which are to be regulated. Thus it redefines the methods which lead to the development of law at two levels. First of all, it excludes a compartmentalized approach of regulation because of the intrinsic and extrinsic linkages among the phenomena which are to be controlled or managed. This is where the notion of ecosystem finds its sense. The lawmakers cannot limit themselves to the known impact of a human activity on certain elements of the environment but they must also take into consideration uncertain and potential forces which may diminish other environmental components. For example, an effective and adequate regulation of the ozone layer cannot ignore desertification, climate change and atmospheric pollution. These four elements are inherently linked among themselves. This new kind of complexity will therefore call, as its corollary, for a new and more comprehensive kind of law. Indeed, the very concept of global environmental governance requires a holistic and systemic treatment of its underlying components.

At the second level, a precautionary attitude also assumes a flexible and open-ended view of law. Traditionally, international law is based on a straight and focused legal reasoning which makes it difficult to take into consideration emerging and interconnected issues. Precaution on the other hand as a technique of managing uncertainty is very different from any notion of a finite law. It is built upon a foundation that allows adjustment and openness. The procedural technique of the framework convention that is completed through the addition of protocols to the extent as scientific knowledge progresses, facilitates this kind of „legal openness". The 1994 Protocol to the 1979 Convention on Long-range Transboundary Air Pollution regarding *newly introduced* reductions of sulphur emissions represents a typical example of this[5]. This new reduction is essentially based on precaution as the protocol's preamble shows clearly: „Resolved to take precautionary measures to anticipate, prevent or minimize emissions of air pollutants and mitigate their adverse effects [...]".

### AN ANTICIPATORY INTERNATIONAL LAW

By definition, precautionary measures attempt to control events which have never occurred as yet and which maybe will never occur. Precaution is turned toward the future and therefore constitutes a technique of legal anticipation with regard to global environmental threats. The preamble of the Convention on Biological Diversity carries a very explicitly anticipatory message: „Noting that it is vital to *anticipate*, prevent and attack the causes of significant reduction or loss of biological diversity at source [...]". Precaution rejects a curative and preventive legal approach. Given that it is not characterized by a curative logic, precaution differs from the polluter-pays principle which is closely linked to compensation for environmental damages. Furthermore, precaution does not depend on a cause-and-effect relationship. Precau-

tion goes beyond the principle of prevention which ties environmental action to scientific certitude.

All aspects of precautionary international law are linked among each other. Indeed, how could we imagine anticipation without uncertainty? How could we take into account interdependence without uncertainty?

## PRECAUTION AND THE PREDICTABILITY OF THE MULTILATERAL TRADE SYSTEM

Risk is the foundation of precaution. Precautionary measures need to be applied to the whole procedure of environmental or health-related risk analysis. Precaution can be implemented through three distinct but often overlapping and interacting phases: assessment, management and communication of risk.

In multilateral environmental agreements with potential trade implications such as the Cartagena Protocol on Biosafety or the Stockholm Convention on Persistent Organic Pollutants(POPs) the trading rights and obligations are spelled out. These agreements imply *de jure* and *de facto* that a member country of the WTO may impose import restrictions regarding those products which pose a scientifically uncertain risk for the environment and *in extenso* for public health.

In the context of these restrictions, precautionary policies and measures that are used to endorse principles of global environmental governance may cause a conflict with the global trade system as it is institutionalized through the WTO. The WTO has built much of its credibility as the central arbiter and steward of the multilateral trade system on its claim of predictability. This perspective has determined a quite specific understanding of the notion of risk in the trade community. The concept of „scientifically identified risk" or „identifiable risk" which was developed by the panel in the *Hormones* case clearly prevails over the scientifically uncertain risk which is intrinsic to precaution. Nevertheless, the WTO's Appellate Body has recognized that precaution „finds reflection" in Article 5.7 of the Agreement on the application of sanitary and phytosanitary measures (SPS)[6].

This recognition of precautionary concerns, however, has a very limited impact as can be seen from the evolution of WTO case law since the *Hormones* case. Indeed, the criterion of scientific uncertainty which is situated at the core of precaution does not *per se* trigger the application of SPS Article 5.7. This has been shown particularly in the recent *Japan – Apples* case in which the Appellate Body has ruled that:

The application of Article 5.7 is triggered not by the existence of *scientific uncertainty*, but rather by the *insufficiency of scientific evidence*. The text of Article 5.7 is clear: it refers to „cases where relevant scientific evidence is insufficient", not to „scientific uncertainty". The two concepts are not interchangeable. Therefore, we are unable to endorse Japan's approach of interpreting Article 5.7 through the prism of „scientific uncertainty."[7]

## CONCLUSION

Activities covered under the concept of global environmental governance depend heavily on scientific information. Precaution avails itself of scientific evidence and in fact promotes the development of scientific knowledge. Furthermore, it may play a fundamental role in the integration of environmental and public health considerations within multilateral trade policy. The promotion of protectionism, discrimination and disguised restrictions to trade are not by any means the goal of precaution. Rather, its ultimate purpose consists in achieving a „sustainable quality of life", *i.e.* a socially equitable, economically viable and ecologically sustainable kind of development. It is only in this perspective that precaution can fulfil its role as a key instrument of global environmental governance and of international law of sustainable development.

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# PORTUGUESE-SPANISH SEMINAR ON GLOBAL CHANGE AND SUSTAINABILITY

➤ **IHDP participated at a seminar on „Global Change and Sustainability“** which was held at the University of Évora, Portugal, April 15-17, 2004. Organized by the Portuguese and Spanish National Committees of IGBP, the event aimed to address Global Change and its links to the major challenge of sustainability. It was assumed that sustainable development requires the correct perception of: the causes and processes responsible for environmental degradation and climate change at the planetary and regional scales, as well as the identification of scientifically based adaptation and mitigation measures to guarantee present and future quality of the environment and human life, either individually or socially.

The event was prepared in the year when IGBP enters its second phase to be developed around the concept of the Earth as a system, that is, as an integrated ensemble of components and between which complex processes, interaction and feedbacks take place that cannot be considered in isolation. Sustainability thus possesses an inescapable scientific basis and a wide scope, which were presented, analysed and discussed in the Seminar (see www.isa.utl.pt/igbp-pc/meetings.html for the scope).

The plenary session by Wolfgang Cramer was entitled „European Ecosystems: the Services they provide and their Vulnerability to Changes in Climate and Land Use“ and introduced the above-mentioned topics. The final Round Table on „Integrated Regional Studies“ counted João Morais (Deputy Director Social Sciences, IGBP Secretariat), Pep Canadell (Executive Director of Global Carbon Project), Barbara Goebel (Executive Director of IHDP) as well as the Portuguese and Spanish NC representatives among its participants.

The Seminar's programme comprised five major themes, organized by sessions: Oceans and Atmosphere, Forests and Desertification, Freshwater Ecosystems and Global Change, Coastal Zones and Sustainable Management of Ecosystems, and Climate Change and Carbon Sequestration. The choice of the Seminar's themes was the result of a broader reflection into what global change issues are more important for Portugal and Spain.

Photo: Bernd Decker

*Dryland agricultural production: Olive plantations near Ubeda, Spain*

In spite of the meeting's high scientific level and the interest shown in it, the lack of integration of the human dimensions was evident in the majority of presentations. Generally speaking, a social science approach was almost inexistent in the Seminar, which reveals that we are still far from developing interdisciplinary or, at least, multidisciplinary ways of working. The description of the principles and goals for the Integrated Regional Studies focuses on the need to understand the anthropogenic components as well as the biophysical and biogeochemical components. It is assumed that all of these components may produce considerable consequences for the Earth System dynamics at a regional and a global scale. But, even though the importance to study all the components of the system has been broadly recognized, it is necessary to improve the link between natural sciences and social sciences. The meeting thus reflected a huge need to improve the dialogue between natural and social sciences in global change research.

The recent creation of the Spanish IHDP is an important step to encourage the Spanish social scientists towards the international Global Change research agenda. We publicly want to recognize the role of Angeles Yuste, from the Ministry of Education and Research of Spain, in having made this possible. The current social sciences research organizations can benefit from the IHDP input, in terms of information, coordination, scientific debates, and others. We plan to distribute information about the IHDP programme at several national congresses of social sciences (sociology, psychology, economy, history, and philosophy) to be held this year.

Photo: Bernd Decker

*Campo de Tabernas, Spain*

This Seminar was also a great opportunity to discuss and plan new forms of collaboration between the Portuguese and the Spanish National Committees. It was planned that in the near future the two committees will make efforts towards building the „Integrated Regional Studies". The objective of this initiative is to promote and facilitate a set of integrated regional studies that[2]: i) are based on the concept of the region as a holistic entity in the context of the Earth System; ii) contribute sound scientific understanding in support of sustainable development in the region; iii) contribute to a quantitative and qualitative understanding of regional-global linkages and the consequences of changes in these linkages. It was assumed that, above all, the integrative regional studies must have relevance for people living in the regions and should provide a sound scientific basis for sustainable development of the atmospheric, marine, terrestrial and human resources of the countries in the regions.

In Portugal, the plans for the near future are to transform the National IGBP Committee into a Global Change Committee, which will integrate the IHDP and the IGBP.

In Spain, a National Committee on Global Change (CEICAG: Comité Español de Investigación del Cambio Global) has been recently established by the Ministry of Education and Science of Spain, integrating IGBP, Diversitas, IHDP, SCORE, SCOPE. This is an important step toward coordinating and integrating interdisciplinary analysis of the Global Change problems.

▼

References to this article are included on the IHDP website at **www.ihdp.org/updatelaw04/references.htm**

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# CLIMATE CHANGE AND HUMAN BEHAVIOUR

## NEW INSIGHTS IN GLOBAL CHANGE RESEARCH

Photo: Bernd Decker

*Global warming in the Alps: glacial lakes fill up while glaciers melt*

➤ On April 5, 2004, about 220 participants in the field of Global Change research met in Berne for the fifth Swiss Global Change Day organized by ProClim (Forum for Climate and Global Change at the Swiss Academy of Sciences). Participants represented a large field of disciplines, including not only geologists, climate experts and biologists, but also sociologists and psychologists.

The meeting was structured into a number of speeches followed by a round table of experts and a „provocateur" whose function was to kick off a debate by setting up a hypothesis or a few statements. The „provocateurs" were: Rudolf Burger from the Berne local newspaper 'Der Bund', Barbara Göbel, Executive Director of IHDP (International Human Dimensions Programme on Global Environmental Change) and Hans-Peter Fricker, CEO WWF Switzerland.

Two presentations specifically addressed human dimensions issues. Rik Leemans from the University of Wageningen presented outcomes of the Millenium Ecosystem Assessment which intends to comprehensively assess the consequences of environmental change in ecosystems, ecosystems services and human well-being. Hence, Leemans pointed out, it has become a scientific objective to better understand the complex linkages between global change phenomena and human well-being.

Heinz Gutscher from the University of Zurich outlined in his speech a social scientific approach to global change issues. He posits that a sufficient level of social thrust and social capital is a prerequisite for a transformation of traditional patterns and behaviours of individuals, groups and networks that may lead to solving our environmental challenges. Combining efficiency strategies with sufficiency strategies can help us spare natural resources. Efficiency can be increased by technological innovation. However, it needs to be ensured that efficiency gains are not outweighed by increased consumption. According to Gutscher, to some extent, it seems possible, that material consumption can be uncoupled from improvements in human well-being through the building of social capital. This thesis suggests that research into social behaviour cannot be neglected in the broad field of global change issues.

A variety of posters had been submitted by junior scientists, eight of these in the category of 'IHDP'. The IHDP poster award was given to Britta Allgöwer from the University of Zürich for her poster called: «Can Long-term Wildland Fire History help to Design Future Fire and Landscape Management? – An Approach from the Swiss Alps» ◄

# CONFERENCE REPORT: BRIDGING SCALES AND EPISTEMOLOGIES

## Linking local knowledge with global science in Multi-scale assessments

ALEXANDRIA, EGYPT, MARCH 17-20, 2004

➤ The conference was organized in the context of the „Millennium Ecosystem Assessment" (MA), a process started by the United Nations in 2001. Originally this conference was planned for 2003 in Kun Ming, China, but it was postponed because of the Sars epidemic. It was hosted by the Alexandrian Library under the directorship of Ismail Serageldin. Originally, the MA process was modeled after the IPCC process, only broader, including all ecosystems. The basic question was how human activities could be supported in the future by ecosystem services.

The real innovation of this process is twofold: there is a global and a local approach. The global approach is in a way rather traditional: trying to model ecosystems and their services and trying to balance this with human needs worldwide. But adding the local dimension created an entirely new perspective. Not only are local ecosystems and their services quite different from the global, but the connections are not simply one of scale; different processes and dynamics appear on the local, regional, and sub-.global levels.

It becomes even more interesting if the knowledge about ecosystems and their services from indigenous people are brought into the process. Indigenous people with their different and often more holistic worldviews and epistemologies have a different perspective on the interwovenness of nature, livelihood, and culture. Not surprisingly, this creates a big challenge.

In the plenary sessions, workshops and panels, a large number of themes were presented. To give a few examples of the concurrent sessions' themes: Linking the Local with the Global in the Millennium Ecosystem Assessment; Indigenous Knowledge, Environmental Assessment and Governance; Multi-Scale Assessments: Advances, Insights and Remaining Challenges; Rethinking Research and Assessment Methods in Indigenous Communities; and Bridging Epistemologies - Indigenous Views. The presentations and lectures were interesting and sparked lively discussions. The below selection of questions and statements gives a feel of how the debates in the conference were conducted:

- Local knowledge is not static; new knowledge is constantly assimilated
- Much knowledge is lost; sometimes lost knowledge can be regained in the research process
- How can the MA framework be used on the ground? Linking the local with the global
- Issues of top-down conceptual framework in which indigenous knowledge does not fit
- Validation of local knowledge
- What right do we have to tell others?
- Notions of power (indigenous knowledge and power relationships)
- Choices of scale are inherently political
- Alienation by language
- Are there similarities between different forms of ecological management?
- Are we doing the right thing?
- Indigenous knowledge is dispersed
- Sometimes vulnerability is increased
- Food security and fighting for survival a more relevant issue for local populations than ecosystems
- What can the scientific community supply?

At the same time, the MA approach missed a number of important aspects. These can be summarized under the headings: consumption, cities, economics, and multinational corporations. The main driving force for unsustainable development comes from increasing consumption by increasing population, mainly living in growing cities in the world, driven by the wrong incentives by the economic system and its institutions. Yet the MA process concentrates largely on remote rural areas, does not address consumption, and scarcely addresses economics. It starts with a framework in which ecosystems providing services for human beings are central. By this, the services to be provided are not questioned; it is essentially a functionalistic approach. These points have been made by participants increasingly towards the end of the conference.

It needs to be stressed that the organizers were very open to this and similar forms of critic. However, the MA process itself is already too far for these notions to be incorporated in the structure of the final reports. Yet, these issues are quite relevant for a possible MA-2 process in which, as the author states, it could be useful to include IHDP researchers from the beginning. Besides opening themselves to the issues of bridging scales and indigenous knowledge they could give valuable feedback from a IHDP-perspective, and address questions of consumption, urbanization, international trade and multinational business.

➤

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# IN BRIEF

➤➤➤ **Sustainability indicators** are used in a variety of different contexts. However, there has been no agreement or consensus on a common set of scientific and management criteria for evaluating indicators from several points of view. The „Assessment of Sustainability Indicators" is a joint initiative by the Scientific Committee on Problems of the Environment **SCOPE,** the International Human Dimensions of Global Change Programme **IHDP** and the United Nations Environment Programme **UNEP** to provide criteria for a science-based assessment of existing sustainable development indicators. This assessment will be presented in a monograph (volume) published commercially, and will also be available in the format of an executive summary for wider, complimentary distribution.

➤➤➤ **The Global Change Unit of the European Commission** organized a symposium on „EC Global Change Research: International Partnership", 6 – 7 May, 2004. The conference discussed research results to date and examined ways to reinforce the cooperation between European and global initiatives on Earth System Science. Opening speeches were given by Research Commissioner **Philippe Busquin,** by the Secretary-General, **M. Jarraud,** of WMO (World Meteorological Organization), by **R.K. Pachauri,** Chairman of the IPCC (Intergovernmental Panel on Climate Change) and by **Guy Brasseur** as representative of the Earth System Science Partnership. **Mr. Valette,** Director-General for Research at the EC also addressed the participants on the Group on Earth Observations (GEO) initiative. Chairs and Directors, as well as SC members, of all four Global Change Programmes participated at the conference, with **Barbara Göbel, Joyeeta Gupta, Frans Berkhout, Sander van der Leeuw** and **Eric Lambin** representing IHDP. It was recognized that close interaction between EC and ESSP was important in order to provide significant contributions to global change research.

➤➤➤ **Pier Vellinga** will step down as a Chair of the IHDP core project on Industrial Transformation as of 1 July 2004 . We are glad to introduce **Frans Berkhout** as his successor. Dr. Berkhout is Director of the Sustainable Techologies Programme (www.sustainabletechnologies.ac.uk) and Senior Fellow at the Science and Technology Policy Research Department, University of Sussex in UK (www.sussex.ac.uk/spru/environment). His research has focused on integrated approaches to environmental policy and analysis, including the relationship between innovation and environmental performance, environmental and sustainability indicators, integrated product policy and socio-economic futures scenarios research. Starting on 1 September he will serve as a Director of the Institute for Environmental Studies in Amsterdam, which hosts the IT IPO.

➤➤➤ **Penelope Canan** is the new Executive Director of the newly opened second International Project Office of the Global Carbon Project (GCP) in Tsukuba, Japan. She moved from the University of Denver, Colorado, where she is a professor of social sciences. She will bring a wealth of much needed expertise to the GCP including long-term experience in bridging natural and social scientists, and policy makers. The purpose of GCP is to develop comprehensive, policy-relevant understanding of the global carbon cycle, encompassing its natural and human dimensions and their interactions with climate. The Tsukuba Office is particularly focused on fostering the human dimensions of the carbon cycle and the challenge of linking such understanding to science on the other components of the Earth System.

*Penelope Canan*

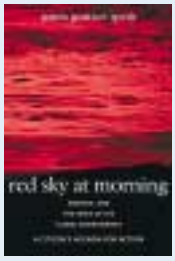
➤➤➤ **Elinor Ostrom,** member of the IHDP Scientific Committee and Arthur F. Bentley Professor of Political Science at Indiana University (and featuring in this issue of UPDATE), has received the John J. Carty Award for her exceptional contributions to the study of social science. In 2003, Elinor Ostrom received a lifetime achievement award from the Atlas Economic Research Foundation for her study of social organizations, urban governance and common-pool resources such as air, groundwater and forests. She also co-authored a new report, which appeared in the Dec. 12 issue of Science, examining the state of the commons and challenging humans to develop and maintain self-governing institutions to prevent tragic resource degradation. Ostrom was elected to the National Academy of Sciences in 2001.

➤➤➤ **Besides the most important IHDP event of this year,** the **IAI-IHDP Institute on Globalization and Food Systems in Costa Rica** (October 24 – November 6, 2004), IHDP is co-sponsoring a number of workshops. A National Workshop on Human Dimensions of GEC took place in March in Santiago/Chile. **„Can cities reduce global warming?** Urban development and the carbon cycle" was a IAI-IHDP organized workshop in Mexico City, also in March. The START **Advanced Institute on Vulnerability** in Laxenburg, Austria as well as the APN Capacity Building Workshop in Islamabad, Pakistan, have taken place in May respectively June. Other sponsored events include: the LUCC Carbon workshop **„Impacts of changes in land use** and management of carbon stocks and turn-over in the tropics" in Copenhagen, 23 – 25 August 2004; the workshop on **„Global Scenarios on land use/cover change"** in September in Kassel, Germany; the **IAI Institute on Urbanization and Global Environmental Change in Latin America,** in Mexico City, September 27 – October 8, 2004; the joint IDGEC/LUCC workshop **„Beyond Multiple Regression:** Interactive Drivers in coupled Human-Natural Systems" in Bonn, 17-18 November 2004; and the LUCC/IT workshop **„The socio-economic dimension** of long-term socio-ecological research", to take place in February 2005 in Vienna, Austria.

## PUBLICATIONS | NEW BOOKS

### Red Sky at Morning: America and the Crisis of the Global Environment

*By James Gustave Speth*




In this timely book, Speth, dean of the Yale University of Forestry and Environmental Studies, sounds the alarm on the seriousness of the global environmental crisis. Overall, he argues, little has been accomplished by the plethora of international conferences, negotiations, action plans and treaties. The failure, for which he sais the US must take much of the blame, stems from a focus on the symptoms rather than on the underlying causes of environmental degradation, such as population size, affluence and technology. He underscores the necessity of achieving sustainability-living off nature's income rather than consuming its capital and he lists eight transitions that are necessary to redefine and redirect growth on a global level.

*Yale University Press, February 2004, 320 p.; ISBN 0-300-10232-1; price: US$ 24 cloth*

### Institutionalizing International Environmental Law

*By Bharat H. Desai*

International regulation of state behaviour poses special challenges for the conservation of natural resources and the protection of the environment. The corpus of international environmental law churned out by this new challenge has necessitated institutional structures. International environmental institutions are the result of the need for international cooperation. These institutions are the result of a complex process of good intentions and compromise. They are a product as well as a contributor to the development of international environmental law. This study shows that international institution building is an organic process directly geared to the needs of states. It underscores the contemporary reality that institutions are essentially tools, operating within legal parameters, for states to address common problems, such as national and transborder environmental threats.

*Transnational Publishers, 2004; ISBN 1-57105-313-1; price: US$ 115 hardcover*

### Environment and Statecraft – The Strategy of Environmental Treaty-Making

*By Scott Barrett*


Environmental problems like global climate change and stratospheric ozone depletion can only be remedied if states cooperate with one another. But sovereign states usually care only about their own interests. So states must somehow restructure the incentives to make cooperation pay. This is what treaties are meant to do. A few treaties, such as the Montreal Protocol on Substances that Deplete the Ozone Layer, succeed. Most, however, fail to alter the state behaviour appropriately. This book develops a theory that explains both the successes and the failures. In particular, the book explains when treaties are needed, why some work better than others, and how treaty design can be improved. For the latter, a theory is presented that integrates a number of disciplines, including economics, political science, international law, negotiation analysis and game theory.

*Oxford University Press, 2003; ISBN 0-19-925733-7, price: US$ 32.36 hardcover*

# MEETING CALENDAR

➤➤➤ *7 June – 10 July – Global Carbon Project Webconference*

**Integrating Carbon Management into the Development Strategies of Cities**
USER Web-site: www.sea-user.org/e_conference.php

➤➤➤ *25–30 July – Trondheim, Norway*

**Congress of Rural Sociology: Globalization, Risks and Resistance**
www.irsa-world-org/XI/dates/index.html

➤➤➤ *1–6 August – Cambridge, UK*

**Gordon Research Conference on Industrial Ecology: Major Technological Transitions**
www.grc.uri.edu/programs/2004/indust.html

➤➤➤ *9–13 August – Oaxaca, Mexico*

**Conference of the International Association for the Study of Common Property**
www.iascp2004.org.mx/indexeng.html

➤➤➤ *11–14 August – St. Andrews, UK*

**2nd International Conference on Population Geographics**
www.st-andrews.ac.uk/gg/News/events.shtml

➤➤➤ *15–20 August – Glasgow, UK*

**30th Congress of the International Geographical Union: One Earth, Many Worlds**
www.meetingmakers.co.uk/igc-uk2004

➤➤➤ *16–20 August – Stockholm, Sweden*

**Stockholm Water Symposium – Drainage Basin Management: Regional Approaches for Food and Urban Security**
www.siwi.org

➤➤➤ *29 August – 1 September – Dundee, UK*

**Good Water Governance for People and Nature: Water Roles for Law, Institutions & Finance?**
www.dundee.ac.uk/law/iwlri/Documents/Conferences/calldundee.pdf

➤➤➤ *2–3 September – Cambridge, UK*

**6th Annual BIOECON Conference: Economics and the Analysis of Biology and Biodiversity**
www.bioecon.ucl.ac.uk

➤➤➤ *5–9 September – Brisbane, Australia*

**Coastal Zone Asia Pacific Conference**
www.coastal.crc.org.au/czap04/index.html

➤➤➤ *17–18 September – Wuppertal, Germany*

**Environmental Economics, Institutions, Competition, Rationality**
www.infer-research.net/ac-2004.html

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