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**The Protection of Traditional Knowledge on the
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World trade**

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THE PROTECTION OF TRADITIONAL KNOWLEDGE ON THE INTERNATIONAL LEVEL – REFLECTIONS IN CONNECTION WITH WORLD TRADE.¹

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Introduction: New Scientific Insights and their Impact

Scientific progress in the last decades furthered the insight in the value and importance of biological diversity and related traditional knowledge: On the one hand, the insight into the interconnection of all ecological processes on local, regional and global level is growing, and the rapid evolution of the genetic sciences and technologies brought about changes in the perception of life and the living environment. Both insights enhanced the understanding of the importance of diversity of animals and plants for the maintenance of the ecosystem-functions. In the field of food crops, the progress in genetics generated new understanding of the importance to maintain a broad genetic basis in order to assure food security in a changing world.

On the other hand, the progress in biotechnology leads to new insights into the use of biological resources. Industry is investing large sums to create new products based on natural resources in the field of food, pharmaceuticals, and life-style. This trend is supported by consumer interest, which in western countries is changing in the direction of environment sensitivity and thus enhances interest in natural products.

In this process, the knowledge of farming communities and indigenous peoples plays a twofold role: First it is of importance for the conservation and maintenance of diversity in wild or domesticated animal species and cultivated plant varieties: Landraces, bred by generations of local farmers and farming communities are an important source for crop genetic diversity and thus of importance to maintain food security; traditional culturally founded control mechanisms support sustainable use of genetic resources by indigenous and local communities³. Second the knowledge contributes to formal innovation processes: information on specific qualities of crops contributes valuable information to the formal breeding processes; traditional knowledge plays an important role in identifying biological resources worthy of commercial exploitation.⁴

These issues confer a threefold significance to traditional knowledge and the related biological resources: 1) Traditional knowledge and biological resources are indispensable for the present-day survival of a great part of humanity. However, 2) traditional knowledge, in its capacity to maintain biodiversity and the underlying evolutionary processes, contributes also to the long-term survival of humanity as a whole; and 3) traditional knowledge is an asset of international trade.

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³ See e.g. preambular paragraph (para) 12 and Article (Art.) 10 (c) of the Convention on Biological Diversity (CBD), concluded in 1992 at the occasion of the United Nations Conference on Environment and Development, and entered into force in December 1993.

⁴ See UNCTAD (2000), Nos 11-15.

Parallel to the increasing insight into its value, traditional knowledge is disappearing at an accelerated rate. Therefore, as a starting point for the further reflections, it is — in accordance with the UNCTAD Plan of Action — submitted that ways and means must be found to maintain and protect traditional knowledge and to equitably share benefits resulting from its use, in order to create economic benefits for developing countries.

This paper looks at these issues from a legal point of view. It explores means and instruments to protect traditional knowledge in the context of international trade and development. However, in analyzing the factual background it becomes evident that the issue shows a complex pattern defined by the specific characteristics of traditional Knowledge and the varieties of interests involved. Legal instruments to support traditional knowledge on national, regional and international levels must be devised according to the criteria resulting from these features, and in taking account of the objectives they are to fulfil. Thus the paper analyses in a first step the specific characteristics of traditional knowledge and explores how trade and development issues influence its existence and maintenance. Against this background it then identifies the objectives, criteria and elements for a legal solution.

Traditional Knowledge – what is it?

In order to find the elements and criteria relevant for a legal solution, it is important to be aware of the different types of traditional knowledge their specific characteristics and protective needs.

Characteristics of Traditional Knowledge

The Convention on Biological Diversity (CBD) speaks in its Article 8 j of “knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity”. The convention does not give a definition of the term. However, the UNCTAD Expert Meeting on Systems and National Experiences for Protecting Traditional Knowledge, Innovations and Practices amply demonstrated that traditional knowledge is a cross-cutting issue which is embedded in the culture of a people. Thus its existence is dependent on, and determined by, the maintenance of this culture and the intact ways and means of its tradition to the next generations. An important element is the close interrelationship between culture, knowledge and the natural environment. Daes (1997) describes the close interaction between the creativity and wisdom of traditionally living communities and the surrounding nature as follows: “Indigenous peoples regard all products of the human mind and heart as interrelated, and as flowing from the same source: the relationships between the people and their land, their kinship with the other living creatures that share the land, and with the spirit world. Since the ultimate source of knowledge and creativity is the land itself, all of the art and science of a specific people are manifestations of the same underlying relationships, and can be considered as manifestations of the people as a whole” (3, No. 21).

At this point it is to be noted that, however, the terminology of what exactly is meant by the term “traditional knowledge” is not uniform and at times rather confusing. In particular, convergence and difference between the knowledge as held by indigenous peoples and by farming communities are not easy to identify. Farming communities seem to be much less organized and politically involved than the indigenous peoples. Their viewpoint is thus less noticeable.

One farmers' document, the Peoples Plan of Action — the statement of NGOs at the occasion of the FAO's Fourth International Technical Conference on Plant Genetic Resources⁵ — stresses the difference between farmers' rights and the rights of Indigenous Peoples. It however points out that also the farmers' innovations are closely linked to the ecosystem it is related to⁶. In the "Farmers Rights Charter", a document drafted by Indian Farmers Unions⁷, the intellectual contribution of farmers to the diversity of crop varieties and animal breeds is emphasized. It is stated that "...Farmers are the original breeders and through their breeding science and technology, they have produced the rich diversity of crop varieties and animal breeds as a gift to the world." Therefore, farmers ought to have the right to "participate fully in any benefits derived from the improved use of these genetic resources". It is stressed that farmers' innovation takes place collectively and cumulatively, and that therefore farmers' rights, arising from their role as conservers and breeders, are community rights."

Thus, in spite of the differences, common features of both types of knowledge can be identified: the information as a rule is not perceived as the creation of individuals, but is understood as the achievement of a specific community, having evolved — and further evolving — in cumulative steps over generations. It is managed and exchanged according to the customs or customary laws of the community. There exists a close interaction between traditional knowledge of any kind and the surrounding ecosystem traditional knowledge plays a key role in the preservation and sustainable use of its diversity of wild and domesticated plant varieties and animal species. In turn it depends on the surrounding environment it has been created in.

As will be shown below, this latter characteristic is of specific importance in the context of global trade.

Types of Traditional Knowledge

From the above it becomes apparent, that there exists a great variety of types of traditional knowledge. The following grouping is considered to be of relevance as a basis for discussing (legal) solutions:

- Traditional knowledge can be *associated* to a biological resource, which is the case of e.g. information on the effects of medicinal plants or on the specific qualities of a crop. It can however also be *integrated* into a biological resource, as is the case with cultivated crop varieties and domesticated animals.
- Traditional knowledge can be freely accessible within a community and be known by everybody as is, e.g., the case with a folk remedy such as *Curcuma* or *Neem*. Access and use can on the other hand be regulated and restricted within the community, as can be the case with plants used for ritual purposes such as *Yagé*.
- Third, traditional knowledge can be clearly allocated to a specific, clearly delimited group, or community or it can be integrated into the culture of a society in general.
- There can fourth also exist differences in the way a community or a people deals with certain types of knowledge: it can wish to keep it secret within a community, or to only transfer it as a gift, its spiritual character being opposed to its marketability. Or it can

⁵ Leipzig, 17-23 June 1996, circulated by Third World Network.

⁶ "All agricultural biodiversity from time immemorial has been cultivated, developed, maintained and improved by farmers familiar with local soils, water cycles, climate, and other fundamental aspects of each particular ecosystem. The knowledge of farmers and indigenous peoples is human knowledge at its best, and forms an important aspect of the intellectual and biological wealth of the South. "

⁷ Draft Charter by Indian Farmers Unions, circulated by Third World Network, February 1996. Cit. from Posey, DA (1996).

wish to market the information, in this case however as a rule insisting on the fairness of the transaction and the sharing of the benefits.

Common Features of Traditional Knowledge: Its Informational Value and the Problem of Allocation

It is important to be aware of the fact that in the questions of traditional knowledge of any kind, we are essentially dealing with information: either the information as contained in traditional knowledge, or the genetic information as contained in the seeds of plant varieties or in domesticated animals. Hence both, traditional knowledge and genetic resources, have an ubiquitous character which is specific to information of any kind. This means that information, once it has been revealed, becomes independent from its source, and it is impossible for the original owner to prove that it was exclusively his. These characteristics correspond to the fundamental paradox of information: information is valueless until revealed, but its value, once revealed, cannot be appropriated. With view to traditional knowledge and information as contained in genetic resources, these traits are due to the following qualities:

- Traditional Knowledge, once it has been revealed, is accessible for everybody. It is true that traditional knowledge frequently has been protected by customary laws within the cultural framework and structures of the communities (Dutfield,1999; Greene and Drescher, 1993). However, these customary laws are not sufficient to regulate conditions of exchange and trade in the broader context of the growing (intercontinental) interdependence and the globalization of the markets (see Girsberger, 1999; Dutfield 1999).
- Genetic resources are self-propagating and also produced and traded as goods for consumption. The pertinent information, which results from the skill of generations of breeders, is contained in each seed. By use of modern biotechnology, access to this information can be gained on the basis of only a small quantity: one seed is sufficient to reproduce the information.

Due to this „open-access“ situation of plant genetic resources and of related traditional knowledge, scientists within industrial innovation systems could use and patent the information for industrial utilisation, often without further improvement and/or an additional “inventive step”. This frequently happened without the consent of the holders of the resources and without compensation or sharing profits. Concerned people and communities speak of “piracy of traditional knowledge“.

According to economic theories, in this informational character of traditional knowledge and genetic information lies an important reason for its loss, as it entails that the value of the information cannot be allocated and converted into economic values.

Influences of Trade and Development on Traditional Knowledge

The Interface of Trade, Biological Diversity and Traditional Knowledge

Above it has been pointed out that maintenance and evolution of traditional knowledge is closely linked to the characteristics of ecosystems it is related to. In looking at the interface between traditional knowledge and trade, this close interaction between the generation and maintenance of knowledge and the intact condition of the natural environment is to be taken account of. Since biological resources are primarily traded as goods for consumption, the

system of trade in raw materials has an important influence on biological diversity and thus indirectly also on the maintenance of traditional knowledge.

Trade-liberalization favours the highest possible yield at minimal cost. This promotes an intensification of the utilisation of the resources as is the case e.g. in timber production or in the so called blue-print farming⁸. In leading to this intensification, the expansion of global markets and recent patterns of trade liberalisation have a double effect on traditionally sustained ecosystems and their biological diversity: on the one hand agricultural (crop) biodiversity is homogenised by standardising food production and consumption (FAO, 1999). On the other hand the conversion and degradation of habitats is promoted by intensifying the production (e.g. forests) or through the abandon of the utilisation. Because the value of biodiversity presently cannot be allocated, land-owners in deciding on the utilisation of their property do not take account of its value. The incentives of the liberalised world trade thus favour the destruction of biological diversity and contribute to environmental degradation and — indirectly — to the loss of traditional knowledge.

Yet, the WTO argues in its study on trade and environment (Nordström and Vaughan, 1999) that "environmental problems and trade are only indirectly linked". It acknowledges, that the problem consists in the missing markets for the valuable services provided. It attributes the resulting market failures to either the missing integration of the externalities, i.e. the environmental costs, or the undefined property rights. Yet, it claims not to be the organization apt to deal with these environmental problems. To resolve the problem, it refers to management schemes on national level and to a more structured environmental cooperation among nations, a need which it considers to have become more urgent by reducing the regulatory autonomy of individual nations caused by the liberalization of international trade.

It is submitted that in acknowledging only a minor link between trade and environment, the WTO underestimates its impact. As the missing of markets for the valuable, but presently non-marketable services provided by biological diversity are identified as the cause of the problem, and as the decline of biological diversity clearly has a global significance, it is also within the WTO that instruments to mitigate possible negative effects of trade liberalisation should be created. Accordingly, it is proposed to establish in the framework of the WTO the necessary legal basis for the creation of economic incentives for the conservation and sustainable use of biodiversity.

Influence of Trade and Development on Traditional Cultures

Besides the described direct ecosystem-influences of trade, the liberalization and increase of trade and in part also the endeavours of industrialized countries to support the countries of the South in their struggle to raise the quality of life, bring about cultural influences which can in turn lead to the loss of traditional knowledge.⁹

This is a process which, in the corollary with the industrial revolution at the end of the 19th century, took also place in the countries of the North. Accordingly it seems to be worth while to take these experiences into consideration. According to Tanner (1996), in the industrialized countries the loss of traditional knowledge was closely linked to the evolution of the formal research and development of, for instance, pharmaceuticals in the industrial

⁸ Industrial agriculture, focusing on maximising commercially important yields and productivity through the use of monoculture systems and uniform technologies, including high yielding seeds, agrochemicals, irrigation, mechanised equipment and large infrastructure developments. FAO/Netherlands Conference on the Multifunctional Character of Agriculture and Land, Maastricht, Netherlands, September 12-17, 1999, Background Paper 1: Agricultural Biodiversity, 20.

⁹ In this context see e.g. Soloman M, Ole Karbolo MK, Oviedo G in this volume.

processes. The preference of scientifically developed products, which were supported by intensive marketing measures, lead to the underestimation and abandoning of traditional knowledge and, consequently, to its disappearance.

In farming systems, similar results might have been brought about by the active promotion and spread of the blueprint approach to development, with its typical expressions of industrial agriculture and the closely related Green Revolution. These endeavours lead to the preference of high-yielding varieties suited for industrial farming. They have increased the food production but often replaced the older landraces.

According to Swanson *et al.* (1994), farmers in subsistence systems used to maintain a high diversity of crop species in order to assure their annual harvests and thus to guarantee a minimal level of production and to prevent food shortage, even at the cost of a higher average productivity. However, the evolution in recent decades, and the results of the green revolution, brought about other means to guarantee subsistence assurance such as the substitution of new varieties for traditional, the substitutions of other assets for biological ones, e.g. the possibility to find temporary paid work in a new centre. The consequence is that the individuals' motivation to maintain diversity as an assurance is reduced. The availability of other means allows to pursue the highest average yield, acquiring insurance by other means. From the perspective of the individual farmer, this concept makes sense. The problem is, though, that the farmer, in maintaining diversity for his own insurance, at the same time performed a task in the interest of the entire society: the conservation and maintenance of crop diversity. In abandoning crop diversity as an individual insurance, consequently, the global interest in a high crop diversity is also not supported any longer. According to Swanson, within one generation the knowledge about the specific utilisation of a crop variety gets lost and with it its specific value and consequently the variety itself. Summarizing it can be stated that international trade and development activities may influence traditional knowledge in different ways: They might create direct and indirect causes for its loss. However they also offer opportunities for trade and thus for the creation of incentives for its conservation, maintenance and further evolution. This makes it abundantly clear that solutions must (also) be found within the trade framework.

Involved Interests

From the above it becomes clear that in the question of the conservation and sustainable use of biological diversity and the maintenance of traditional knowledge in the connection with trade, different interests are involved:

- The overall global long-term interest in conserving genetic resources and related knowledge, i.e., the interest in securing long-term food security and survival.
- The interests of supplying nation states, which have the authority to define access within their boundaries and which, according to the CBD, are the recipients of the shared benefits (Art. 15 (7)).
- The interests of the local and indigenous communities in sharing benefits resulting from use of genetic information and related traditional knowledge generated within their communities and in the respect of their customary laws and institutions.
- The interest of national and international research, trade, and industry in easy access to information, a clear and concise approach to access negotiations, and timely issuance of research permits.

Analysing the above, three main types of interests can be distinguished: First, the economic interests of providers — nation states and local people — and purchasers; second, the

interest in conservation and sustainable use of biological resources, and third, the interests of the holders of the information in the autonomous decisions over its future use.

Proposed Solutions

The CBD has taken up these issues. It links conservation of biodiversity with economical issues and takes up both conservation and sustainable use of biological resources. For the first time in international law of nature conservation it combines conservation issues with trade and the need to develop economically poor states.¹⁰

The CBD confirms the sovereignty of states over their biological resources. However, the right of states to dispose of their genetic resources is not unlimited. Of primordial importance in our context is the states' obligation to facilitate access to genetic resources for the CBD's contracting parties (Art. 15 CBD). This regulation establishes the basis for contractual relations between donor countries and prospecting firms. It prescribes that access to genetic resources be granted under the condition of prior informed consent, mutually agreed terms, and fair and equitable sharing of research and development results as well as benefits arising from use of genetic resources.

The existence, value, and importance of *traditional knowledge* is implicitly recognised by the CBD. The pertinent Art. 8 (j) obliges parties to encourage sharing benefits arising from use of traditional knowledge. However, according to the CBD wording, this article contains an obligation to support and further traditional knowledge in the context of conserving biological diversity and thus contains no legal basis to create an individual right. The obligation also retains the reservation of national legislation. Therefore, according to the CBD, traditional knowledge remains in the public domain

One difficulty in regulating the subject matter consists in the fact that CBD obligations bind states as contracting parties and confers no rights or obligations to private entities such as research institutes and indigenous communities. Without specific regulations at the national level, regulation of access and benefit-sharing is currently left to contracts between bio-prospectors (bio-prospecting firms or scientific institutes) and public authorities in donor countries.

This contractual approach has several disadvantages. First, there is no obligation to include the actual owners of information in the access and benefit-sharing procedure. As a result, they cannot decide on the fate of their knowledge and profit from results of their achievements. Second, the contractual solution lacks authority to bind third parties and often implies a disparity in negotiating powers.

Different solutions and types of rights are proposed to clarify the access and benefit-sharing regulations of the CBD, and/or to protect traditional knowledge and the framework in which it is created. Three main groups can be distinguished: First there is a series of proposals for non-compulsory codes of conduct for access and benefit sharing, which aim to mitigate the fact that, in principle, the CBD rules only bind the States as contracting parties, but not the private purchasers which however are the main stakeholders on the acquiring side.¹¹

¹⁰ As to the discussions on farmers' rights and benefit sharing in the framework of the revision of the International on Plant Genetic Resources, (adopted at the 22nd Session of the FAO Conference as FAO Conference Resolution 8/83 on Nov. 23, 1983 (International Undertaking, IU)), see Biber-Klemm S (in print, 2001).

¹¹ A case in point: the Draft Guidelines on Access and Benefit Sharing Regarding the Utilisation of Genetic Resources: A Proposal of International Guidelines by Switzerland, Presented to the Fifth Conference of the Parties of the Convention on Biological Diversity. Kopse A and Girsberger M, this Volume.

A second proposition is creation of a funding system, particularly in the domain of the farmers' rights. Due to special characteristics of plant genetic resources for food and agriculture (PGRFA), determining individual holders of farmers' rights can be very difficult if not impossible. Therefore Girsberger (1999), for instance, proposes creation of non-exclusive rights to compensation in monetary and non-monetary form. This compensation should be funded by those having an interest in conservation of traditional PGRFA and those using these resources, *i.e.*, national governments and formal plant breeders. The financial means of the fund should be allocated on the basis of project proposals ¹².

A third group of measures focus on the problem of allocating and documenting information and controlling lawful implementation by the purchasing states. Thus e.g. the Society for Research and Initiatives for Sustainable Technologies and Institutions (SRISTI) in India has developed databases of traditional knowledge¹³. Registers of traditional knowledge are part of (draft) national legislation. Ideas exist to the creation of international registration of traditional knowledge (Cottier, 1998 and Drahos 2000), and propositions are made to develop a World Information Network/ Information System on Plant Genetic Resources for Food and Agriculture and to strengthen existing systems¹⁴ in the framework of the revision process of the IU¹⁵.

Another proposition is the creation of an international certification system. Countries providing resources and traditional knowledge would issue certificates of origin which prove the lawful acquisition of information. These certificates ought to be included in the patent application procedure on use of genetic resources and/or traditional knowledge ¹⁶.

Another proposition is to create property rights to protect traditional knowledge, the so called traditional intellectual property rights (TIP-Rights), in the framework of the TRIPS-Agreement (Cottier, 1998). These rights would have to be adapted to the characteristics of traditional knowledge and designed to answer its specific protective needs. In particular the TIP-Rights ought not to rely upon novelty but encompass pre-existing traditional knowledge and know-how relating to plant and animal genetic resources.

These propositions presently are discussed in a general, and often very political and controversial way. Yet, in order to find a consensus in creating legal instruments to protect traditional knowledge, the involved interests will have to be balanced. It is submitted that in this regard two points ought to be looked at more closely: First, it is to be kept in mind that the described interests not necessarily are opposed to each other. The creation of a win-win situation, integrating the various interests can be imagined and ought to be aimed at. Second, not in each case all interests must or can be served to the same degree. One example is e.g. the difference between the spiritual knowledge of indigenous peoples, for which the autonomous decision over its tradition and future use has more weight than in the case of knowledge on the specific qualities of crop varieties. Solutions will have to be tailored taking account of both the protective needs and the goals of the measures.

In order to develop criteria to assess the described proposals and to find indications as to their further elaboration and specification, it might be worth discussing economic and ethical background arguments.

¹² Funding devices are integrated e.g. into the International Undertaking (Annex III, Para. 3. 3), and into the CBD (Art. 21). Negotiations on the funding mechanism in the revised IU are still under way (see Art. 16 of the Composite Draft Text, Commission on Genetic Resources for Food and Agriculture (CGRFA), 2000).

¹³ For more examples see Dutfield G. (2000).

¹⁴ E.g. the System-wide Information Network for Genetic Resources (SINGER) of the Consultative Group on International Agricultural Research (CGIAR).

¹⁵ See Art. 10 of the CGIAR Contact Group Composite Draft Text.

¹⁶ Compare Tobin B, 1997.

Background Arguments

Economic and Legal

The Non-internalisation of Costs and Benefits

As can be concluded from the above — and has been amply demonstrated by the UNCTAD Expert Meeting — maintenance of traditional knowledge and of biological diversity is a cross-cutting issue which needs to be considered in the widest possible context. It therefore ought to be integrated into general policy development procedures and also be considered at the interface between trade in, and conservation of, natural resources.

The catchword signalling strategies, which could be of relevance in this context, is the notion of “sustainable use”. Hence the economic theory dealing with the integration of the principle into the liberal market system, might give some indications as to possible solutions.

According to Johnston (1996), an important feature of the principle of sustainable use in an economic context lies in the approach of persuasion through incentives: “Sustainable use as an economic concept is ... about creating the right incentives so that those who manage biodiversity, the stakeholders, will be motivated to conserve it.” Economic theory holds that in order for any resource to be properly managed by market mechanisms, the price of that resource needs to reflect all the values that society places upon it. This means internalising the external benefits and costs associated with using a resource. In environmental law, this principle is, as a rule, realised by the “polluter pays” principle: the environmental costs caused by the utilisation of a resource (e.g. for the sewage treatment) are internalized into its price, thus creating an incentive to use the resource efficiently. According to economic theories, if the resources are not in this sense properly valued, misleading information about their scarcity is created, thus providing inadequate incentives for their utilisation and management.

In the case of biodiversity and traditional knowledge however, the concept of the cost-internalisation does not make sense; utilisation of biodiversity does not in the same way create damage to the environment as is e.g. the case with the utilisation of clean air or water for waste disposal. The process of biodiversity loss is difficult to assess economically in a market context. With regard to use of biodiversity/biogenetic resources, the reverse consequence stays in the foreground: diversity creates benefits accruing to society as a whole, and potentially to its owner. Consequently it is argued that, in order to create incentives for its conservation, the *benefits* generated by its use must be internalized. As an instrument to this end, the creation of property rights is proposed.

The Necessity to Create Incentives at Grassroot Level

In formal innovatory systems, specific instruments to protect the generated information — the intellectual property rights — have been created, in order to create incentives to for creativity and investments in formal R&D processes.

However, at the level of earlier production stages, i.e., where the basic information is created by informal R&D processes, as e.g. by traditional breeders and indigenous peoples, no comparable instruments exist. Thus, the benefits from retaining diversity are appropriated at a level within the agricultural industry far removed from the individuals making decisions concerning the utilisation of their land (Swanson *et al*, 1994 and Swanson and Göschl, 2000).

Swanson and Göschl (2000) conclude that the current property right regime, which creates incentives to invest in R&D at the level of the industrial production, but does not generate investments in its earlier stages, is “probably inadequate for the efficient management of the flow of information within this industry”. They put forward that property right regimes at the intermediate and supplier levels must be considered as ways of redressing this inefficiency. Accordingly they conclude that, in order to maintain basic investments and innovation processes, incentives should be created at the level where the information is created, i.e., at the level of the indigenous and farming communities. Swanson proposes creation of an “informational resource right“ as a specific property right, tailored in analogy to intellectual property rights, to protect the informational value of biogenetic information and to allow the appropriation of the value of the information at the level it has been generated.

The Principles of the “Global Public Good”

As developed above, biological diversity of domesticated and wild animals and plants and related traditional knowledge are of importance for humanity and its long-time survival as a whole. Its conservation therefore is of global interest.

The plant genetic resources for food and agriculture (PGRFA) are one example to illustrate this insight, which of course is true also for the other types of biodiversity and of traditional knowledge:

The information contained in a community of animals and plants, which have co-evolved over centuries, secures the continuity of natural evolutionary processes and adaptation of species to a changed world. In conserving this diversity, the option remains intact that exploration and use of currently unknown resource stocks will generate discoveries of unknown traits and characteristics and that the evolutionary process might result in unforeseeable generation of a new and useful quality (Swanson, 1995). The loss of any species and even gene could thus limit our options for the future. A broad genetic basis and surroundings in which the evolutionary processes are maintained are thus an important element to secure the nutritional needs of the entire humanity and of future generations in a changing world.

Agrobiodiversity is maintained by local subsistence farming systems, as a side-effect of their striving to prevent food shortages. And local and indigenous people, in sustainably using and conserving wild resources, by e.g. actively nurturing wild plants or through loss of profits caused by extensive resource use, thus contribute to the “global biodiversity services”. Local subsistence farmers and indigenous peoples thus perform a service to humankind. However the value of diversity presently is freely accessible to everybody and the information it contains has no marketable value. These elements correspond to the characteristics of the “public good”¹⁷.

The problem of a public good is, that whilst the entire society benefits from its use, the free accessibility entails that no mechanisms for its provision such as e.g. market-mechanisms, exist. Therefore, if the public good is to be maintained, specific measures are needed for its provision (Kaul *et al.* 1999; Swanson *et al.*, 1994). The public policy implication is that states, respectively international regimes, must play some role in the provision of such goods; otherwise they will be undersupplied (Stiglitz, 1999). Stiglitz identifies two strategies to provide for the public good "knowledge", i.e. for informational values: 1) to increase the

¹⁷ The notion of “public good” is defined by two main qualities: 1) its benefits are non rivalrous in consumption, i.e. their utilisation by one person does not exclude the utilisation by others and 2) its benefits are non excludable, i.e. it is extremely difficult and costly to exclude others from the utilisation of the good (Kaul *et al.*, 1999).

degree of appropriability of the returns by issuing intellectual property rights and/or 2) to grant direct government support.

In this context it is important to be aware that with the privatisation of knowledge, important welfare losses can be associated. This becomes obvious in the case of crop varieties, where the open exchange is a basic prerequisite for the further evolution of new varieties. However, this fact is true also for the customary exchange of traditional knowledge (and also for the results of formal basic research).

Stiglitz too points out that there are types of information, such as basic research and other fundamental forms of knowledge, which “almost certainly” should remain in the public domain as parts of the “global commons” and not be privatized by an intellectual property regime. In this case, however, public support for the provision of this “public-good-information” is required. He proposes that the international community could claim the right to charge for the use of the global knowledge commons — as is the case for the utilisation of other common goods.

The Necessity of an International Approach

As mentioned above, the WTO's special study on trade and environment (Nordström and Vaughan, 1999) refers to the national legislation for solutions at the interface between trade and environment. The argument is that environmental problems are “best addressed at the sources, whether they involve polluting production processes or undefined property rights over natural resources”. For the informational values as enclosed in biological resources and traditional knowledge, this would mean to create instruments to appropriate this value at the national level.

However, the scope to resolve problems at an national or regional level remains limited. Within the nation states, traditional knowledge frequently is protected by customary laws within the cultural framework and structures of the communities. However, these customary laws are not sufficient to regulate conditions of exchange and trade in the broader context of the growing (intercontinental) interdependence and the globalization of the markets.

The CBD-System of access to genetic resources and the fair and equitable sharing of benefits is – as mentioned above – based on a bilateral, contractual approach between provider countries and purchasers (Art. 15). Some of the disadvantages of this solution have been described above.

As the states under the CBD have the obligation to facilitate access to the genetic resources, several countries and regions are drafting laws to regulate access and benefit sharing, including access to traditional knowledge and sharing the benefits from its use.¹⁸

However, the interest in traditional knowledge and biogenetic information is characterized by its international dimension, the transfer mainly taking place between non-industrialised and industrialised countries. As is well known, this imposes some important problems, in particular with view to abuse of information which is easily accessible: The control of the rightful acquisition of the information, the fulfilment of the terms of the contract, and the sanctioning of infractions outside the jurisdiction of the national state is difficult. The benefit-sharing mechanisms, apart from up-front payments, are difficult to control as well, as they are funded on mutual trust, and require disclosure of the benefits and transparency with view to net gains.

¹⁸ E.g. the Peruvian Proposal for a regime of Protection of the Collective Knowledge of the Indigenous Peoples and the regional regime of the Andean Community in its decision 391. Compare Muller MR, this volume.

For the control of the implementation and for the sanctioning of infractions, on the national and regional level only indirect measures are possible. An example in case is the solution of Decision 391 of the Andean Community: Within the Member States, the recognition of illicitly attributed property rights as well as future access to their genetic resources can be denied.

It can be concluded that — given the global dimension of the interests involved and the international character of the markets — the scope to resolve problems at a national or regional level remains limited. Clearly these issues call for international measures. Moreover, it is maintained that the global dimension of the interests involved lead to international responsibility which in turn requires international solutions.

Ethical Arguments

Issues at the interface of traditional knowledge, biogenetic resources and international trade are mainly discussed in an political, legal and economic context. However there are relevant ethical arguments which ought to be taken into consideration and more fully elaborated. Beyond, some indications as to possible strands of thinking are given.

The Argument of Equity

As mentioned above, in the case of the formal innovation systems, the intellectual property rights exist as specific instruments to protect the generated information have been created. They permit the temporary appropriation of the value of the information by its author, such allowing compensation of the invested capital and work by marketing the invention, and creating an incentive for creativity and innovation.

The system of intellectual property rights has grown over time in different ways. This expansion consisted first in creation of new rights. In our context, a case in point are plant breeders rights which aim to protect the innovative skill of breeders as contained in crops¹⁹. Secondly, in step with the increasing globalisation of trade, the system of intellectual property rights has undergone a process of regulatory globalisation and harmonisation. The latest example of this evolution is, of course, conclusion of the Agreement on Trade-related Aspects of Intellectual Property Rights (TRIPS) in the frame of the Uruguay Round of GATT negotiations. Thirdly, intellectual property rights have also expanded in scope.

This evolution mirrors the typical process of evolution of legal systems. They evolve over time in response to changing situations and needs which are often brought about by scientific and technical progress. The last example in the field of intellectual property rights are efforts to devise legal protection for achievements in biotechnology.

However, traditional knowledge and genetic information as enclosed in landraces bred by local communities can as a rule not be protected by intellectual property rights. Traditional knowledge frequently lacks the criteria of novelty, the necessary inventive step, or the level of creativity which is the prerequisite for protection by industrial IPRs. Landraces as developed by informal breeding systems of farming communities fail to fulfil the criteria of stability and uniformity and thus fail to meet the protective criteria of plant breeders rights. An imbalance exists between the protection of formal innovation, and of the informational values as contained in traditionally generated information.

It can be argued that both types of information are the result of comparable intellectual accomplishments. They are generated in investing brain force and creativity, making use of

¹⁹ In the International Convention for the Protection of New Varieties of Plants of December 2, 1961.

resources formerly invested into infrastructural devices and requiring investments either in the form of financial assets or — in the case of biogenetic resources and traditional knowledge — in foregoing higher profits.

It is thus submitted that the option to create instruments to protect the informally generated intellectual achievements of farming communities and indigenous peoples, is also to be assessed under the aspect of equity, in the sense of equality and of distributive justice.

The Argument of Autonomy

The option to create TIP-Rights specifically adopted to the protective needs of traditional knowledge, is discussed controversially. Two of the arguments against the creation of rights to traditional knowledge are: first that traditional knowledge, being an integrated part of cultures and traditions of the peoples, does not lend itself to a concept of private property, and that the innovative system of traditional communities does not correspond to the concept of industrial IPRs. Second, it is feared that privatization of knowledge will hinder free exchange between groups and lead to conflicts over ownership. (Girsberger, 1999; Brush, 1994).

In the presently predominant economic discussion property rights and ownership are mainly discussed under the aspects of the marketability of the property, the creation of incentives and economic efficiency and criticised as colonialist, racist and usurpatory instruments²⁰

However, it is to be kept in mind that this appropriation function is only one aspect of the property rights. Ownership also contains the right to control the use of the property and thus enables the owner to decide over the fate of his property. Intellectual property rights follow this principle: They create exclusive rights for the author of the information and empower him to decide on its further use.²¹

This liberal aspect of ownership creating freedom and autonomy (Hegel) frequently gets lost in the current discussions. However this aspect could prove to be of importance also for traditional knowledge, particularly in the context of knowledge which has a strong cultural or spiritual character. It would allow the authors to regain autonomy over their intellectual property. The aspect of autonomy and freedom might be of specific importance in the context with information which is not tradable in the sense of the liberal market theory.

It is not submitted to simply copy the system of the industrial intellectual property rights. However, the creation own systems of intellectual property rights, adapted to the specific needs and protective aims of traditional knowledge ought to be seriously taken into consideration.

Conclusion

In concluding it can be summarized that there are different types of traditional knowledge, which make necessary different types of protection. It is submitted that instruments to protect traditional knowledge ought to be devised according to the factual differences between the types of information. Presently the concepts to protect traditional knowledge rather follow institutional criteria (IU/CBD).

In order to find a consensus in creating legal instruments to protect traditional knowledge, the involved interests will have to be balanced. Measures to protect traditional knowledge

²⁰ Cited from an COICA Statement as cited in Drahos, 1997

²¹ See also Drahos, 1997.

must be evaluated/assessed with view to their objectives. Objectives and criteria might be contradictory. This must be made transparent in the decision process and consensus on the priorities is to be achieved. Not all criteria can/must be equally fulfilled for the protection of the different types of knowledge, a decision as to the priorities might be necessary.

Given the specific characteristics of traditional knowledge and the international character of the markets, bilateral contractual agreements and national regulation on ABS are not sufficient for the protection of traditional knowledge. The global dimension of the interests involved lead to international responsibility and require international solutions.

According to the background arguments elaborated above, two principal instruments to protect traditional knowledge have emerged: the creation of specific rights to traditional intellectual knowledge and the setting up of an international funding system. However, as has been demonstrated, additional supporting measures will be necessary to its support and maintenance as the complexity of the problem cannot be answered by an uniform and simple solution. Action must be taken in several areas and in a multi-layered approach, which encompasses rights, instruments, and institutions for their implementation, and other supporting measures. The following measures are proposed:

- To create the option to allocate specific rights to traditional knowledge based upon individual or community rights wherever this is possible. The aim would be to integrate a basic right to traditional knowledge (traditional intellectual property right) in an international legally binding instrument, its detailed implementation being left to the competence of the nation states.
- To create a legal basis and mechanism for a funding system which generates incentives for and permits compensation of the maintenance of biodiversity. The funding system could be applied in cases where the pertinent information cannot be allocated to specific authors.
- To introduce measures to control lawful acquisition of traditional knowledge into the IP procedures of the purchasing countries.
- To elaborate additional supporting measures and incentives in the context of the (international) markets and trade, such as e.g. labelling, certification, auditing systems, and tax reductions.

In further investigating these propositions, the following criteria are considered essential:

- Instruments to protect traditional knowledge should create a sound basis to secure access to genetic resources and their exchange on local, regional and international levels.
- The procedures for getting the permission for access to genetic resources and related traditional knowledge must be clear, simple and not too time consuming.
- Freedom to decide on access to and – under defined conditions – control of use of knowledge for its authors must be ascertained.
- Incentives are most effective if applied at the level where the decisions are taken, i.e. at the level of the farmers and/or the farming communities, or the nation states.
- Free exchange of knowledge at the community level and free exchange of research must be possible; in general, means must be found to minimize welfare losses caused by less dissemination of knowledge.
- The customary laws governing the exchange of PGRFA, and the tradition of the knowledge between farming families and communities are to be maintained and supported. In particular the option to create community rights to protect traditional knowledge must be ascertained.
- Solutions should aim at minimizing transaction costs while maximizing efficiency and effectiveness.
- Ways and means must be found to guarantee simple, inexpensive, and easily accessible

procedures to protect traditional knowledge.

Further research is necessary to evaluate the political and practical feasibility of the proposed solutions and to elaborate on the details of the measures. It is to be emphasized that it is of great importance that these rights are elaborated and evaluated with utmost care and in cooperation with the people concerned.

Efforts are necessary to mutually understand the different systems of creativity and innovation and to impartially listen to the ideas, wishes, needs of all stakeholders involved, in order to create a basis for transparency, confidence and mutual exchange. Time seems to be past for the exchange of political argumentation only. What is needed for further research and discussion is sound information on the factual background in general and in particular of the (so-called) informal knowledge systems.

The UNCTAD Expert Meeting has been an impressive and valuable step to this aim.

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²² The presented text is based on the following publications by the author. Please refer to these texts for more detailed argumentation:
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