

Intellectual Property Rights: Implications for Development

Published by

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Funding for the UNCTAD-ICTSD Project on Intellectual Property Rights and Sustainable Development has been received from the Department of International Development (DFID, UK), the Swedish International Development Agency (SIDA, Sweden) and the Rockefeller Foundation.

The Project is being implemented by the International Centre for Trade and Sustainable Development (ICTSD) and the secretariat of the United Nations Conference on Trade and Development (UNCTAD) (Project Number INT/OT/1BH). The broad aim is to improve the understanding of intellectual property rights-related issues among developing countries and to assist them in building their capacity for ongoing as well as future negotiations on intellectual property rights (IPRs).

For details on the activities of the Project and all available material, see <http://www.ictsd.org/iprsonline>

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Printed on CyclusPrint 100% recycled paper by Imprimerie Gerafer, 7rte de Nanfray, 74960 Crans-Gevrier, France. August 2003

ISSN 1681-8954

FOREWORD

This policy discussion paper is one of the products of the joint UNCTAD-ICTSD Project on Intellectual Property Rights and Sustainable Development. It is intended to contribute to a better understanding of the key policy issues raised by intellectual property rights (IPRs) and their impact on economic development, poverty alleviation and sustainable human development.

Part One provides a general explanation of the rationale behind IPRs and their evolution, as well as an overview of the multilateral system for their protection. These international rules have important socio-economic implications that are dealt with in Parts Two and Three. Part Two addresses some broad cross-cutting issues that constitute the basic premises behind the adoption of stronger IPR regimes in developing countries, such as the fostering of innovation and creativity as well as access to and use of new technologies. Finally, Part Three discusses the impact of new IPR standards on specific areas of concern for developing countries, namely: health; food, agriculture and biodiversity; traditional knowledge and folklore; and access to knowledge and educational, technical and scientific information. Parts Two and Three therefore analyse in more depth some of the issues addressed in Part One.

Intellectual property rights have never been more economically and politically important or controversial than they are today. Patents, copyrights, trademarks, industrial designs, integrated circuits and geographical indications are frequently mentioned in discussions and debates on such diverse topics as public health, food security, education, trade, industrial policy, traditional knowledge, biodiversity, biotechnology, the Internet, and the entertainment and media industries. In a knowledge-based economy, there is no doubt that an understanding of IPRs is indispensable to informed policy making in all areas of human development.

Intellectual property (IP) was, until recently, the domain of specialists and producers of intellectual property rights. However, the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) concluded after the Uruguay Round negotiations signalled a major shift in this regard. The incorporation of intellectual property rights into the multilateral trading system and their relationship with several key public policy issues has elicited considerable concern over their pervasive role in people's lives and in society in general. Developing country members of the World Trade Organization (WTO) no longer have the policy options and flexibilities developed countries had in using IPRs to support their national development. But TRIPS is not the end of the story. Significant new developments are taking place at the international, regional and bilateral levels that build on and strengthen the minimum TRIPS standards through the progressive harmonization of policies towards the standards of the technologically advanced countries. This implies that there are

considerable challenges ahead in designing and implementing IP policy at the national and international levels.

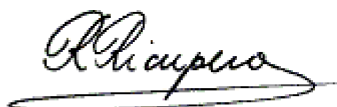
Empirical evidence on the role of IP protection in promoting innovation and growth in general remains limited and inconclusive. Conflicting views also persist on the impact of IPRs on development prospects. Some point out that in a modern economy, the minimum standards laid down in TRIPS will bring benefits to developing countries by creating the incentives structure necessary for knowledge generation and diffusion, technology transfer and private investment flows. Others stress that intellectual property, especially such elements as the patenting regime, will adversely affect the pursuit of sustainable development strategies, for example by: raising the prices of essential drugs to levels that are too high for the poor to afford; limiting the availability of educational materials for developing-country school and university students; legitimising the piracy of traditional knowledge; and undermining the self-reliance of resource-poor farmers.

It is urgent, therefore, to address the following questions: How can developing countries use IP tools to advance their development strategy? What are the key concerns surrounding the issues of IPR for developing countries? What are the specific difficulties they face in intellectual property negotiations? Is intellectual property directly relevant to sustainable development and to the achievement of agreed international development goals? Do they have the capacity, especially the least developed among them, to formulate their negotiating positions and become well-informed negotiating partners? Policy makers need to address these essential questions in order to be able to design IPR laws and policies that best meet the needs of their people and negotiate effectively for future agreements.

The joint UNCTAD-ICTSD Project on Intellectual Property and Sustainable Development was launched in July 2001 precisely to address some of these questions. One of the main objectives has been to facilitate the emergence of a critical mass of well-informed stakeholders in developing countries – including decision-makers, negotiators as well as the private sector and civil society – to enable them to define their own sustainable human development objectives in the field of IPRs, and effectively advance those objectives at the national and international levels.



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ACKNOWLEDGEMENTS

This Policy Discussion Paper was prepared as part of a joint project on Intellectual Property Rights (IPRs) and Sustainable Development being implemented by the International Centre for Trade and Sustainable Development (ICTSD) and the secretariat of the United Nations Conference on Trade and Development (UNCTAD) (Project Number INT/OT/1BH). The broad aim of the project is to improve understanding of TRIPS-related issues in developing countries and to assist those countries in building their capacity to participate actively in ongoing as well as future negotiations on intellectual property rights. The activities of the Project have benefited from the generous support of the Department for International Development (DFID) of the United Kingdom, the Swedish International Development Agency (SIDA) and the Rockefeller Foundation of the United States.

A team led by Pedro Roffe (Project Director, UNCTAD-ICTSD) and Ricardo Meléndez-Ortiz (Executive Director, ICTSD), and comprising Christophe Bellman, Marie Chamay, Graham Dutfield, Khalil Hamdani, Assad Omer, Christoph Spennemann, Taffere Tesfachew and David Vivas, has been responsible for the preparation of this work.

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We wish to thank all the individuals and institutions that provided useful comments at various stages in the preparation of this report, in particular: Adronico Adede, John Barton, Susan Bragdon, Jorge Cabrera, Bipul Chatterjee, Charles Clift, Sergio Escudero, Atul Kaushik, Nagesh Kumar, Robert Lettington, Keith E. Maskus, Mina Mashayekhi, Christopher May, Sisule F. Musungu, Leo Palma, Dwijen Rangnekar, Jonathan Salvadoray, Susan Sell, Urs P. Thomas, Carl-Gustav Thornström, Hanns Ullrich, Simon Walker, Richard Wilder and Abdulqawi Yusuf.

The final product is the result of the collective efforts of the persons involved. However, the UNCTAD-ICTSD team assumes sole responsibility for its contents.

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ACRONYMS & ABBREVIATIONS

ABS	access and benefit-sharing
CBD	Convention on Biological Diversity
CGRFA	Commission on Genetic Resources for Food and Agriculture (formerly CPGR)
CPGR	Commission on Plant Genetic Resources (of the FAO)
DMCA	Digital Millennium Copyright Act (of the United States)
EMR	exclusive marketing right
EPO	European Patent Office
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FDI	foreign direct investment
GATT	General Agreement on Tariffs and Trade
GI	geographical indication
ICT	information and communication technology
ICTSD	International Centre for Trade and Sustainable Development
IMF	International Monetary Fund
IP	Intellectual property
IPR	Intellectual property right
ISP	Internet service provider
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture (of the FAO)
MTA	material transfer agreement
PBRs	plant breeders' rights
R&D	research and development
TK	traditional knowledge
TNC	transnational corporation
TRIPS	Trade-Related Aspects of Intellectual Property Rights (also a WTO Agreement)
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UPOV	Convention for the Protection of New Varieties of Plants (abbreviation derives from the French title: Union internationale pour la protection des obtentions végétales)
WCT	WIPO Copyright Treaty
WIPO	World Intellectual Property Organization
WPPT	WIPO Performers and Phonograms Treaty
WTO	World Trade Organization



Overview

Since the early 1990s, Intellectual Property (IP) policy has become one of the most economically and politically contentious issues in the international arena, whether in discussions on public health, food security, education, trade, industrial policy, traditional knowledge, biodiversity, biotechnology, the Internet, or the entertainment and media industries. For many policy makers working in these specific areas, IP policy is an entirely new subject. Indeed, historically, it was the exclusive domain of legal specialists and the owners and producers of intellectual property. In the same vein, few developing countries have had much direct experience with IP policy. And for those that have introduced some IP policies, the relevant laws and agencies have been marginal to discussions on national development.

Over the past decade, IP has joined fiscal, monetary, trade and industrial policies, and overseas development assistance, as a key area in which developing countries have come under pressure to identify their interests and define public policies. In the context of a global economy increasingly propelled by knowledge-based industries, the protection of ideas and innovations has become a priority in the competitive strategy of powerful economic industries and countries. Ownership and distribution of these assets has become a high-stakes issue in international negotiations.

This paper discusses the relevance to developing countries of the various debates on IP, with a focus on the implications of IP policy for economic development, poverty alleviation and sustainable human development. The policy paper is not prescriptive, nor does it pretend to be exhaustive. Rather, the goal is to support informed, constructive debate among policy makers and relevant stakeholders by clarifying key policy issues, reviewing the major policy-making processes, drawing attention to evidence, or the lack thereof, on controversial issues, and providing guidance on relevant information sources.

As one of the main outputs of the joint UNCTAD-ICTSD Project on Intellectual Property Rights and Sustainable Development, this paper is complemented by a series of separate studies analysing specific issues of particular relevance to developing countries such as compulsory licensing, geographical indications, traditional knowledge, transfer of technology and indicators of the relative importance of intellectual property rights (IPRs) in developing countries. The joint UNCTAD-ICTSD Project has also produced a *Resource Book on TRIPS and Development* to serve as an authoritative, practical guide to the TRIPS Agreement. For each

provision of the TRIPS Agreement, the Resource Book analyses the negotiating history, possible interpretations, existing jurisprudence, and the relationship with other international instruments, as well as the potential social and economic implications.

This policy paper contains three parts. Part One provides a general introduction to the underlying assumptions and rationale underpinning IP policies. It reviews the historical evolution of IP rules, noting the varying views of governments and industry regarding the appropriateness of the objectives, nature and role of IP policy to their specific economic and political contexts. The key agreements and international institutions, which together comprise the global intellectual property regulatory system, are also presented here.

Part Two focuses on three cross-cutting issues and potential opportunities offered: creativity and innovation, access to and use of new technologies, and technology transfer. Debates about the relationship between IP policies and each of these cross-cutting topics are a constant feature not only of the general IP policy landscape, but also of debates on a range of specific areas of concern for developing countries. Part Three explores challenges arising from each of these specific areas of concern for developing countries with regard to IP policy in the fields of: health; food and agriculture; traditional knowledge, folklore and cultural property; and access to knowledge and scientific information.

This Overview presents the highlights of the discussions contained in each of the sections of this paper. It begins with a brief look at why and how intellectual property has emerged as a key development policy issue.

What is intellectual property policy?

Intellectual property policy is concerned with the design, implementation and enforcement of a system of legal devices commonly referred to as "intellectual property rights". These legal devices take a number of different forms, including patents, copyright and related rights, industrial designs, trademarks, trade secrets, plant breeders' rights, geographical indications, and rights to layout-designs of integrated circuits. Of these, patents, copyright and trademarks tend to attract the greatest attention.

A survey of the goals stated in existing national and international laws reveals a generally shared understanding that, at the broadest level, intellectual property policies exist to contribute to the enrichment of society by helping to promote:

- (a) the widest possible availability of new and useful goods, services and technical information that derive from inventive activity; and
- (b) the highest possible level of economic activity based on the production, circulation and further development of such goods, services and information.

Beyond this broad view, there is considerable debate as to what kinds of IP policies will best help advance these goals. The specific objectives and provisions of IP policy have varied greatly as governments have worked to balance various goals.

Most IP laws and devices share common conceptual foundations and assumptions, namely that the provision of legal rights to those who invest their resources (e.g. creative energy and financial capital) in innovation will spur further knowledge development, creativity and the availability of new products for society. IP rights (IPRs) usually provide investors with a monopoly privilege, for a specified length of time, to exploit their innovations and turn them into commercial advantages. After a certain time, these legal rights terminate, whereupon these now unprotected inventions and works become part of the public domain and can be freely used by others.

Depending on their existing priorities, governments place differing emphases on the goals of rewarding and promoting innovation, protecting industrial investment and international competitive advantage, rewarding importers of foreign technologies, promoting diffusion of new knowledge, creating incentives for future innovation, and affordability of technologies. In countries where little inventive activity takes place, encouraging easier flow of technical information may generate more technological capacity building than providing stronger exclusive rights.

Similarly, stakeholders present a range of different goals and interests that they believe should be served by IP policies. For holders of intellectual property rights, for example, the primary purpose of IP may be to recoup investment costs, but also to develop and maintain market power and dominance. One of the main challenges for IP policy makers is to balance the interests of creators and investors on the one hand, and other potential users of IP, including researchers and consumers, on the other. Because of the economic stakes involved, the design of IP systems is not just a matter of economic calculation, it is also an inherently political exercise.

Why has IP policy become such a topical development issue?

IP policies are not new. They have existed in developed countries, and in many developing countries, for decades and in some instances centuries. Yet, one of the most distinctive features of IP policy has been its relative insulation from the kind of public debate common in most areas of public policy. One reason for this is the arcane and complex legal nature of IP policies.

Clearly, much has changed in recent years. IP policy has acquired a global dimension and as such it has become an issue that is hard to ignore for several reasons.

First of all, significant changes in the international regulatory system for IPRs have in themselves stimulated greater attention to IP policy. Perhaps the most significant change is the entry into force of the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) (see discussion below).

Second, the pressure on developing countries to implement national TRIPS-compliant IPR policies has generated, sometimes for the first time, national debates in those countries about the appropriateness of IP protection.

Third, the IP policy arena is now one of the most dynamic areas of international law. Beyond the TRIPS Agreement, significant new agreements are being forged at the international, regional and bilateral levels that build on and strengthen the minimum TRIPS standards. There is a common tendency in these agreements for protectable subject matter to be expanded, for new rights to be created, and for the basic features of intellectual property rights to be standardized. Consequently, national IPR regimes throughout the world are becoming increasingly pressured to harmonize their regimes in line with standards of protection that follow the standards of the technologically advanced countries.

For developing countries, these changes in the IP policy framework generally represent a considerable strengthening of the protection offered to IP holders. The intense pressure from developed countries to implement policies to strengthen IP protection has generated increased interest in the intersections of IP policies and other development policies and goals.

Opinions on the impacts on developing countries of strengthened IP policies vary widely. On the one hand, proponents of strong IP protection and enforcement claim these are indispensable for developing countries. They argue that strengthened IP laws help developing countries create the incentives structure and institutional framework necessary for knowledge generation and diffusion, technology transfer and private investment flows. In the face of constant pressure to maintain international competitiveness, businesses are increasingly concerned about the prospect of "free-riding" where other, foreign companies may benefit economically from the technological investments of one company, and potentially undercut its competitiveness. IP policies are being harnessed as a way to preserve private appropriation of rents from investment in innovation in the context of international trade and investment.

On the other hand, a spectrum of dissenting voices remains sceptical of claims used to justify stronger protection. Some critics argue that current trends in the global IP system will have a range of deleterious short- and long-term effects on developing countries, including raising the prices of essential drugs beyond their affordability by the poor, limiting the availability of educational materials for developing-country school and university students, legitimising the piracy of traditional knowledge, and undermining the self-reliance of resource-poor farmers.

Some critics, concerned that greater IP protection could reinforce the concentration and market power of large economic actors, emphasize the need for strong competition policies to address anti-competitive behaviour. If TRIPS were fully implemented, estimates indicate that annual transfers to major technology-creating countries - particularly the United States, Germany and France - in the form of royalties and licensing fees for pharmaceutical patents, computer chip designs, and other IP, would amount to more than \$20 billion. Stated baldly, this means that TRIPS represents a \$20 billion-plus transfer of wealth from the technology-importing nations (many of which are developing countries) to the technology exporters (few, if any, of which are developing countries) that may or may not be outweighed by future gains. For example, potential benefits such as foreign direct investment (FDI) may take quite a long time to accrue, and their scale is difficult to predict, particularly in light of the variety of policy issues and economic conditions that influence FDI decisions. Moreover, they note that IPRs can inhibit, rather than enhance, the flow of trade by limiting market access opportunities for foreign competitors.

Most fundamentally, some critics question the assumption that IPRs are necessary for innovation and commercial investment in new technologies. Most commonly, those who have doubts about the impact of existing IPR regimes, are not pro or anti intellectual property rights *per se*. Rather, they call for a more careful analysis of which IP policies will serve what goals and whose interests, and under what conditions.

For developing-country members of the WTO, the core concern is that they no longer have the policy options and flexibilities in the IP policy arena that developed countries earlier relied upon to serve their national development. The historical evidence confirms that several of today's developed countries readily exploited the absence of agreed international standards in the past, adapting their level of protection according to national needs. The evidence also suggests that while patent systems, for example, may indeed have helped to stimulate the development and diffusion of new technologies that were the foundation for industrial development, countries benefited from freedom to choose from a variety of possible national systems.

In short, for developing countries, the emerging global IP regulatory regime appears to place severe constraints on the policy "space" available to them to devise and implement IP policies that are supportive of development goals. Far more relevant data is needed in order to fully understand the range of possible benefits and losses to developing countries of the introduction of stronger IPR regimes. At present, it is far from evident that stronger IP protection will generate the presumed gains in terms of economic transformation in developing countries to the level anticipated by proponents. Arguably, the harmonized IPR regime that developing countries currently encounter is far better suited to the interests of technological leaders than technological followers.

The global intellectual property rights regime

As discussed in chapter 2, the expansion of international IP protection is a process that has evolved steadily over the past few decades to the point that, today, most countries of the world are now involved in what can best be described as a global system of intellectual property regulation. This system comprises a series of intersecting international agreements and several powerful international institutions, the most important institutions being the World Trade Organization (WTO) and the World Intellectual Property Organization (WIPO). The global IPR regime is very much a work in progress.

The TRIPS Agreement

The substantive obligations and disciplines set forth in the TRIPS Agreement are now widely accepted as the centrepiece of the international IPR regime. This policy paper reviews the history and the concept of “trade-related” intellectual property. For those seeking higher standards of IP protection, compliance and enforcement, the incorporation of IPR issues into the General Agreement on Tariffs and Trade (GATT)/WTO has presented an attractive opportunity to include all IPRs in a *single* agreement. It has also meant that, for the first time, WTO Members risk action under the WTO Dispute Settlement Understanding if they fail to implement and enforce the minimum TRIPS standards. In addition, by placing IP issues within the scope of the WTO, Members are obliged, for the first time, to implement IP laws consistent with the most-favoured-nation and national treatment principles. This means that a Member’s IP protection and enforcement system must be non-discriminatory as to the nationality of rights holders. That Member must also extend any advantage it grants to the nationals of one country to the nationals of all other WTO Members.

While the supporters of the TRIPS Agreement were quite clearly developed countries and industry, the Preamble to the Agreement notes the importance of broad public policy priorities, including developmental and technological goals. It also highlights the need for a multilateral framework of principles, rules and disciplines dealing with international trade in counterfeit goods. The formal objectives of the Agreement include: the protection and enforcement of IPRs, the promotion of technological innovation and the transfer and dissemination of technology. The Agreement specifies that countries may adopt measures to protect public health and nutrition, and promote public interest in sectors of vital importance to their social, economic and technological development.

TRIPS also places considerable emphasis on enforcement, obliging countries to make available fair and equitable procedures that “permit effective action against any infringement of IPRs”, and which are not unnecessarily complicated, costly or time-consuming.” The judicial authorities must be granted the power to require infringers to pay adequate damages and to provide for criminal procedures and penalties (with the possibility of imprisonment or monetary fines as remedies). For many developing countries, particularly the least developed

countries, the cost of implementing and maintaining an effective IP administration and enforcement system presents a significant economic burden. The cost is particularly high for the least developed countries, because regulators and courts lack experience in this area. Consequently, relevant legal expertise must be developed or imported, forcing countries to depend on external financial, legal and technical assistance from bilateral and multilateral aid agencies.

Within the WTO, the Council for TRIPS is the forum in which Members monitor compliance with the Agreement. Importantly, the TRIPS Agreement is not set in stone. The TRIPS Council has the possibility to review implementation of the Agreement at two-year intervals and can undertake additional reviews in the light of any relevant new developments, which might warrant modification or amendment of the Agreement. At the 2001 Doha Ministerial Conference, for example, Members agreed to: negotiate the establishment of a multilateral system of notification and registration of geographical indications for wines and spirits; examine the relationship between TRIPS and the Convention on Biological Diversity (CBD) and the protection of traditional knowledge and folklore; establish a Working Group to examine the relationship between trade and technology; and reaffirm the mandatory nature of the obligation for developed country Members to provide incentives to entities and institutions within their territories for the purpose of promoting and encouraging technology transfer to least developed country Members. Members also agreed upon the Doha Declaration on TRIPS and Public Health, designed to ensure that the TRIPS Agreement did not hinder the capacity of developing countries to provide access to medicines in their countries in cases of public health emergencies.

Beyond TRIPS

The TRIPS Agreement is just one part of a broader system of multilateral, regional and bilateral agreements and treaties relating to IPRs.

Standard-setting treaties define agreed basic standards of protection for the different IPRs; they include: the Paris Convention for the Protection of Industrial Property, the Berne Convention for the protection of Literary and Artistic Works, the Rome Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organisations, and the 1996 Internet Treaties, all of which are administered by WIPO.

In addition, multilateral treaties include agreements on global protection systems, which facilitate filing or registering of IPRs in more than one country (e.g. the Madrid Agreement Concerning the International Registration of Marks and the Patent Cooperation Treaty). Finally, classification treaties (e.g. the Strasbourg Agreement Concerning International Patent Classification) organize information concerning inventions, trademarks and industrial designs into indexed manageable structures for easy retrieval.

Regional and bilateral agreements take several forms and can set global precedents, which are sometimes incorporated into global agreements. In addition, trade agreements, rather than stand-alone IP treaties, govern bilateral IP relationships. Like other regional agreements, they can include provisions that go beyond TRIPS obligations, such as extending patents to new subject matter, eliminating certain exceptions, and requiring the introduction of protection at a faster pace and higher standard than what TRIPS requires. In addition, these agreements can require contracting parties to accede to certain international conventions.

The global IPR regime also encompasses several sector-specific actors and institutions. For example, the World Health Organization (WHO) is actively involved in providing advice and technical assistance to governments in the area of health and IP policy. There are three international treaties which form part of the framework for IP protection related to plant varieties and genetic resources: the International Union for the Protection of New Varieties of Plants Convention (UPOV Convention); the Convention on Biological Diversity; and the Food and Agricultural Organization's International Treaty on Plant Genetic Resources for Food and Agriculture.

In sum, over the past decades, the following major trends have characterized the evolution of the global system on intellectual property rights: the widening of protectable subject matter; the creation of new rights to accommodate technological advances; and the progressive harmonization and standardization of the basic features of IPRs.

The multiple negotiations under way in a wide range of fora means that countries are under considerable pressure to identify their national IP interests in each area. The development of coherent, effective and sustainable policies and negotiating strategies on IPR policy at the multilateral, regional and bilateral levels is becoming increasingly difficult, particularly for countries with poor resources. Many developed countries hope to raise and strengthen standards for IPRs. Some developing countries, while acknowledging the TRIPS Agreement's weaknesses from a development perspective, are working to creatively take advantage of the flexibilities it can provide. Others are working to lower the mandated standards. At present, the evolving international IPR system continues to raise the floor of minimum standards for IPRs above and beyond the TRIPS Agreement. This TRIPS-plus environment represents a significant narrowing of the policy options available to developing countries.

Cross-cutting issues: opportunities for developing countries to develop policies appropriate and responsive to their local conditions.

Fostering creativity and innovation in developing countries

Developing countries are the hosts of significant creative activity, particularly in the areas of textile design, plant cultivation, medicines, software and music. Much of this activity has flourished in the absence of an effective IPR regime. A critical question facing developing countries is what kinds of IPR policies may effectively foster more creativity and innovation

while transforming these into commercially viable products that generate productive employment and export opportunities.

As discussed in chapter 3, several components of IPR policy can be usefully harnessed to help promote the development of industries in specific sectors of interest to developing countries (e.g. software, textiles and music).

Patent and second-tier patent systems: utility models

Countries with a weak technological base can adopt carefully defined exceptions and limitations to the patent regime. They should examine the possibility of adopting a second-tier patent system such as utility models. While TRIPS is silent on this type of IPR, many countries have adopted second-tier regimes. Their characteristics vary considerably. Usually, they exist along with traditional patent regimes. Rights are generally accorded to inventions that show local or regional novelty, and the requirements for inventiveness are usually low. The duration of protection varies from 6 to 20 years, and the invention may not necessarily require either examination or registration. There is persuasive evidence that cheap and rapid second-tier patent protection can assist small and medium-sized businesses, particularly where local industrial or production sectors are engaged not so much in major inventions, but in incremental innovation or improvement (e.g. toy manufacturing, clock and watch making, optics, micro-technology, and micro-mechanics). For small, local firms, the second-tier patent systems can provide a much cheaper opportunity to process applications (largely because of the absence of examination). That said, second-tier patent regimes still rely on a broader incentives structure to ensure that there are innovations to protect; they also require patent lawyers capable of filing applications. In addition, the fact of non-examination can result in the granting of overly broad claims, which in turn can provoke uncertainty for other inventors and loss of confidence among their holders in the security of their rights.

Industrial design protection

Industrial designs protect the outward appearance of a product, as opposed to its technical functions. Most, but not all, industrial design laws are registration-based. In designing such a system, policy makers need to consider the range of potential challenges to designers and artists (e.g. ensuring that the registration formalities are not too onerous). In the context of short-lived design products such as those made by the toy, fashion, household and furniture, and textile industries, which are fast-moving, quickly imitated and in need of immediate protection, the most common forms of protection are unregistered design rights or copyright (see below, concerning the textile industry), rather than registered design right.

Trade secrets

Trade secrets provide inventors with a method for protecting themselves against unauthorized exploitation of their inventions (particularly those which are either unpatentable or for which the costs of patenting are too high). They also help to protect

against disclosure of information. For developing countries, features of a pro-competitive trade secrets law could include provisions to eliminate obvious forms of industrial espionage and permit reasonable restraints on the use of technical secrets by professional employees who leave employment. These laws could also provide other researchers and inventors with an absolute right to reverse-engineer products covered by trade secrets and to independently discover, duplicate and patent undisclosed research. Trade secrets can, however, create absolute and long-lasting barriers to entry in some sectors. This is why governments often prefer the patent system, with its emphasis on disclosure of technological breakthroughs in exchange for fixed-term exclusive rights.

Trademarks

Trademark protection can provide a valuable tool to help develop brand recognition and commercialisation of high-quality crafts, clothing and music products from developing countries. It can also help firms differentiate products by quality and increase their value-added.

Chapter 3 reviews some IP policy options relevant to several industries of particular interest to developing countries.

Software

In the realm of software, developing countries face the challenge of balancing several objectives and policy options. Copyright law provides a case in point. For countries that wish to expand the average size and value-added of local software development, copyright protection may be of interest. The appropriate scope of protection depends, however, on the nature of the software being produced. While some software companies may want protection to help them to recoup their investment, others may also wish to save costs by reusing pre-existing work or elements of those works. Indeed, it is often the same firms that want to protect their software, but also to build on pre-existing works. Hence the need for a copyright law that adequately preserves a balance between the innovations of today and those of tomorrow.

Textiles

The textile, fashion and garment industries of developing countries may also benefit from improved IP protection. Under the TRIPS Agreement, countries can use either copyright or design laws as a means to protect the design of such goods. Copyright may be more attractive for short-lived production that can be quickly imitated and which is in need of immediate and automatic protection (particularly where industries rely on incremental rather than massive design improvements). This is because design law has tended to be more cumbersome and expensive than copyright given its relatively higher thresholds for protection (e.g. in terms of originality or novelty) and registration procedures.

The music industry

In the music industry, developing countries are endowed with abundant music talent. While the scope for development is great and the export of music has been increasing rapidly, relatively few countries are able to record compositions and make money in either domestic or export markets. Copyright protection policies are one means of helping to nurture and protect the music industries of developing countries. Even where copyright protection is in place, policy makers need to provide efficient, transparent and fully accountable royalty collection and distribution regimes among the key parties concerned (e.g. composers, performers, publishers and recording companies). There has been considerable discussion about how to design collective management systems in ways that maximize benefits to local artists and producers (rather than serving as collection agencies for large foreign firms). Clearly, the development of an internationally competitive music industry will also rely on a broader range of public policies to support technological restructuring processes, marketing strategies, joint ventures, local content requirements, deregulation of the local radio industry, and synergy between local and international musicians.

New technologies

Over the past decade, the potential of new technologies, particularly biotechnologies and information and communications technologies (ICT), to contribute to development has attracted considerable attention and debate. The capacity of developing-country research centres, universities and the business sector to generate inventions in new technologies varies considerably. These issues are examined in chapter 4.

Biotechnology

There is growing interest in the potential applications of biotechnology to a range of different activities in developing countries, in the hope of generating new industrial and trade opportunities. To date, however, the most visible and profitable industrial applications, such as pharmaceuticals, have remained largely beyond the affordable reach of most developing countries, both in terms of research contributions and access to final products.

In the coming years, a number of practical factors could lower the barriers to entry for developing countries and increase the possibility that some developing countries may become sources of innovations in this field. After determining whether, to what extent, and how they wish to harness biotechnology for development, developing countries need to formulate an IP policy as a critical component of their overall policy framework. For a country to become an active contributor to biotechnological research, a solid national system of innovation should be in place (e.g. basic R&D, skilled personnel and a strong education system). Clearly, IP policy cannot be separated from other policies and institutions touching upon growth and development of a country.

The TRIPS Agreement makes no explicit reference to biotechnology. There are, however, important provisions relevant to biotechnology in the Agreement, particularly in Article 27.3 (b), which addresses the issue of patentability. Countries are provided a series of obligations and options with regard to how they define a patentable invention in the context of biotechnology. The policy paper reviews the various requirements in detail and emphasizes the considerable flexibility countries have in terms of defining a patentable invention, depending on their objectives with respect to biotechnology development. Broadly speaking, countries can choose to offer broad, strong patent protection in the field of biotechnology, or, for example, they can take advantage of the options to exclude certain products (e.g. plants and animals) and processes (e.g. essential biological processes for the production of plants or animals) from patentability. They can also pursue the option of *a sui generis* alternative to patents for the protection of plant varieties.

In some developed countries, laws and courts allow patenting of isolated DNA sequences so long as a credible use is disclosed. Other jurisdictions include novelty standards so that isolation of a naturally occurring substance is insufficient to demonstrate novelty. The extension of patent protection to genes and gene fragments has attracted considerable controversy within the scientific community of developed countries. There are concerns that patents in this field raise the cost in conducting research and could have the adverse effect of slowing down innovation. Some critics raise objections, on moral and religious grounds, to patents not only on genes but also on plants, animals and other so-called "life forms".

Information and Communication Technologies (ICT)

Information and communication technologies (ICT) is a field in which tremendous advances have been achieved in a very short time. The main sources of innovation in the ICT field are the software, hardware, semiconductor and telecommunications industries. Many other industries involved in the fields of electronic information processing and communications also have an interest in IP regulation, namely Internet service providers (ISPs), content providers, content creators, World Wide Web browsers and e-commerce businesses. Each of these players has a distinctive view on IP protection. Content providers, for example, tend to favour levels of copyright protection even stronger than those for the print environment. ISPs, on the other hand, tend to argue against stronger protection, especially given the possibility of finding themselves liable for the copyright infringement of their users.

Although some developing countries are important sources of ICT innovation, access is likely, overall, to be a greater priority than the promotion of innovation. Innovative firms in developing countries are already finding it hard to grow in the context of highly concentrated ICT markets. Even where developing countries are critical centres of production, it is their partners in developed countries that usually capture most of the value for the design and sale of products.

The ICT revolution is pushing the boundaries of IP policy in several ways. The TRIPS Agreement requires countries to protect software through copyright law. Software and database developers favour this copyright protection as a way to protect both expressions and limited access to information. In the United States, for example, software developers can copyright the code of their programs without having to fully disclose it (they can also secure additional protection by keeping the source code secret through trade secrets laws). While TRIPS does not explicitly state that countries must provide for the patenting of software, some countries are required to do so under the terms of bilateral trade agreements. In the EU, patents are not officially permitted on computer programs, yet several have been issued. TRIPS also obliges countries to implement a *sui generis* system for the protection of semiconductor chip designs.

For developing countries, key priorities to consider in this regard are to ensure that users of information on the Internet are guaranteed “fair-use” rights, such as making and distributing printed copies from electronic sources in reasonable numbers for educational and research purposes, including the use of reasonable excerpts in commentary and criticism. Countries also need to pay attention to particular methods employed by suppliers of digital information and software to restrict fair use. These include the use of overly restrictive, non-negotiable licensing contracts (e.g. for software or for access to electronic journals) and the use of technological devices and barriers to prevent copying. These new “anti-circumvention” measures not only seek to restrict access to works, but may also allow owners of IPRs to deny users their lawful rights of fair use. Governments may, for example, want to ensure that efforts to circumvent technological protection for purposes of fair use should not be made illegal. As such, it should not be illegal to produce, use and disseminate technologies which aim to circumvent these barriers.

Technology Transfer

Most developing countries remain net importers of new technologies and products and technology transfer is thus a critical element of their strategies to promote technical improvements in production processes and diversification into new productive activities. The vast majority of modern technological innovations are owned by companies, research institutes, universities or individuals in developed countries. Patent ownership, for example, is heavily skewed in favour of the developed countries. The vast majority of international applications continue to be filed by companies based in North America, Western Europe or Japan.

Chapter 5 points out that technology transfer is a complex process with several core components, including the sharing of physical technologies, codified knowledge, know-how and management techniques. The literature on technology transfer distinguishes between informal and formal aspects of technology transfer. Informal technology transfer generally

refers to the practice of "imitation", which served as a powerful instrument for technical change and learning for such economies as Japan and the Republic of Korea. Formal technology transfer, on the other hand, is generally a commercial operation that takes place through firm-to-firm arrangements and involves flows of knowledge, be they embodied in goods (as in the sale of machinery and equipment), or in ideas, technical information and skills (through licensing, franchising or distribution agreements), and movement of experts and skilled labour.

A core assumption underlying the TRIPS Agreement is that the "protection and enforcement of intellectual property rights" will contribute "to the transfer and dissemination of technology". The Agreement stipulates that developed countries shall provide incentives to their enterprises and institutions for the purpose of promoting and encouraging technology transfer to the least developed countries. Proponents of stronger IP protection in developing countries assert that the combination of stronger IP laws and more stringent enforcement will also enhance flows of FDI to developing countries, and greater innovation through research and development.

The empirical evidence concerning the links between stronger IP protection and technology remains inconclusive. However some studies have shown that the relationship between IP policies and technology transfer depends on the level of development of a country, the specific technological fields involved, and the behaviour and absorptive capacity of individual firms. They also suggest that the impact of stronger IPR regimes on informal and formal modes of technology transfer can be expected to differ.

In terms of formal technology transfer, it is possible that the combination of stronger laws and enforcement in the areas of patents, trademarks and trade could build greater confidence among foreign companies that they will be able to retain control over their technologies, and would thus effectively make them more willing to increase formal technology transfer and FDI. In terms of informal technology transfer, implementation of TRIPS could take the form of putting in place a series of disincentives (e.g. the threat of trade sanctions) to pursue traditional practices of imitation. Again, the evidence here is not conclusive. Increased protection and domestic legal rights for foreign IP owners may simply reinforce their ability to block access to their technologies or to charge licence fees that are too high for domestic firms. In addition, it must be borne in mind that it is not simply patent information or access to a patented product that is important for technology transfer. Equally important is the associated "know-how" which most companies continue to guard carefully. Indeed, in many cases of FDI in developing countries, companies maintain their core design knowledge and tasks in the host or other developed countries. Moreover, the data available so far are hardly conclusive, and suggest that FDI decisions may depend on a host of factors beyond the status of IP policies, including the general investment climate.

In sum, it is clear that countries should not simply accept the assumption that strengthening and enforcing IPRs will induce much more innovation, FDI and technology transfer. Experience from other countries suggests that a number of other factors are at least as important for establishing and benefiting from these processes. Therefore, it becomes evident that the effect of strengthened IP protection is often dependent on its relationship with other factors, such as the size of the domestic market, the specific technological fields involved, the behaviour and absorptive capacity of individual firms, the structure of factor supply, productive infrastructure, the level of development of the country, and the degree of stability of the macroeconomic environment. It may be the case for certain products and contexts, but the oft-repeated assertion of a positive correlation for developing countries between IP policy on the one hand, and innovation, FDI and technology transfer on the other, should be approached with caution.

Specific areas of concern: Challenges for developing countries in the implementation of new IP standards

Health

The relationship between IP policies and access to medicines has emerged as one of the most controversial policy debates in the IP field, as discussed in chapter 6. Access to affordable medicines is a key priority for many developing countries, particularly the least developed countries. A range of obstacles, including inadequate public health infrastructure, inefficient marketing and distribution networks, insufficient funding, cumbersome regulatory procedures and high prices of medicines, frustrates access to medicines. The issue of high prices has generated increasing criticism about the existence of powerful patent monopolies in the health sector. In particular, pharmaceutical companies have been condemned by many NGOs and several governments for failing to do enough to assist the millions of people dying from HIV/AIDS for lack of access to anti-retroviral drugs. They are also criticized for deploying an extremely low proportion of their R&D to diseases affecting poor people; and for putting pressure on developing-country governments to prevent the local manufacture or import of cheaper, copied version of the drugs produced in countries where patents are not available or respected.

Exclusive rights afforded by patents enable companies that hold them to set and maintain prices at high levels. Pharmaceutical companies argue that patents are a vital means for them to capture returns from their R&D, and that they are a critical tool for providing incentives to invest, particularly in risky, expensive new drug development. From a developing country perspective, a key policy priority is to help ensure that drugs are available to doctors, hospitals and individuals at lower, more competitive prices. Promoting early competition from generic medicines is one important way to foster competition, stimulate price reductions and expand access to drugs. In recent years, attention has focused on the patents

and public-health-related provisions of the TRIPS Agreement. The TRIPS Agreement obliges all WTO Members to grant patents for pharmaceutical products. Prior to TRIPS, no similar obligation existed in international law, meaning that more than 50 countries did not grant any protection for pharmaceutical products, and many more provided much weaker protection than that called for by TRIPS. In addition TRIPS requires Members to provide for product patents as well as protection against unfair commercial use of the information submitted for the marketing and approval of drugs. New obligations in TRIPS include: granting patent protection for at least 20 years from the date of patent application, limiting the scope of exemptions from patent rights and obligations, and effectively enforcing patent rights through administrative and judicial mechanisms. Together, these rules have dramatically changed the global framework for the commercialisation of drugs and affordable access to them in developing countries.

Nevertheless, TRIPS allows countries to implement their obligations in a manner necessary to meet human health priorities. In order to promote competition, the TRIPS Agreement does provide leeway, through a number of important flexibilities, for Member countries to adopt measures that mitigate the exclusive rights conferred by patents. Developing countries have several options to reduce the costs of the obligation to grant patents on pharmaceutical products. First, in the case of a national emergency or other circumstances of extreme urgency, TRIPS permits countries to pursue compulsory licensing (or authorization for public non-commercial use) even without prior negotiation with the title holder. The Agreement specifies that this authorization must be “predominantly for the supply of the domestic market” thereby limiting the ability of countries to issue a compulsory licence with the goal of supply the third countries in need of patented medicines. In many instances, the threat of compulsory licensing has also served as a useful tool that developing countries can use. The very possibility of compulsory licensing tends to strengthen the bargaining position of governments and third parties, even if such licences are never actually granted. Second, the TRIPS Agreement also permits countries to pursue parallel imports of patented products when they are obtainable in a foreign country (where a patent also exists) at lower prices. Third, countries can pursue the option of establishing exceptions to exclusive rights, such as the early-working exception (also known as the Bolar exception), which allows generic firms to initiate and obtain marketing approval of patented drugs before the expiration of their respective patents.

In response to concerns by governments and civil society, in 2001, WTO Members adopted the Declaration on the TRIPS Agreement and Public Health. The Declaration affirms that TRIPS should not prevent Members from taking measures to protect public health, and reaffirms the right of countries to use, to the full, provision in TRIPS that allow each Member to “grant compulsory licenses and the freedom to determine the grounds upon which such licenses are granted.” It also allows WTO Members to establish their own regime for “exhaustion” of intellectual property rights. The Declaration does not, however, address the problem of countries lacking the capacity to produce drugs, and which find it difficult to take effective

advantage of compulsory licensing. Paragraph 6 of the Declaration instructs the TRIPS Council to “find an expeditious solution to this problem”.

Food and agriculture

Over the past decade, the potential impact of new IP rules and legislation on food security, agriculture and biodiversity has been one of the primary IP policy concerns for developing countries. Chapter 7 examines some of these concerns.

Plant variety protection, access and benefit-sharing

A range of policy instruments is relevant to the issue of plant variety protection, and the policy landscape is continuing to evolve. Most significantly, the TRIPS Agreement requires all WTO Member countries to provide IP protection for plant varieties, either in the form of patents, or through a “*sui generis*” (i.e. of its own kind) system, which, in principle, allows countries to develop their own system for protecting plant varieties. While some countries are doing so, others have elected to adopt model legislation formulated by the Union for the Protection of Plant Varieties (UPOV).

There has been considerable debate about UPOV's model legislation. Many developing countries have expressed discomfort with the plant-breeder-rights (PBR) approach, arguing that it is designed to accommodate the specific characteristics of capital-intensive, large-scale commercial agricultural systems that prevail in developed countries. Concerns about PBR-style protection, discussed in this policy paper, suggest that it fails adequately to account for the interests of poor farmers, that it inadequately acknowledges the historic contributions of traditional farmers to the development of plant varieties, and that it will diminish the availability of genetic resources for further breeding. There are also concerns that the process of protecting plant varieties diminishes the prospects for sharing of plant varieties, and may contribute to genetic erosion. Finally, there is concern that the PBR regime encourages greater centralization of research, rather than research tailored to respond to local environmental and socio-economic conditions.

Beyond the specific debates about PBR, there are concerns that strengthened IP protection to plant varieties (whether through patents or plant variety protection) contributes to further privatisation of the genetic material needed for research, privatisation of agricultural research itself, an increased concentration of breeding materials, research tools and technologies in the hands of a small number of giant corporations, and the shrinkage of non-proprietary public sector research. But regardless of their concerns, many developing countries find themselves under pressure or obligations in bilateral and regional trade negotiations to adopt UPOV-style plant variety protection. The Organization of African Unity has, for example, developed a model law for the protection of the rights of local communities, farmers, and breeders, and for the regulation of access to biological resources.

In 2001, the Indian parliament adopted the Protection on Plant Varieties and Farmers' Rights Act.

Chapter 7 also notes the relevance of the Convention on Biological Diversity (CBD) (and its Bonn Guidelines on Access Legislation) and of the new International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) of the FAO to the task of implementing IP policy in this area. In practice, the relationship between TRIPS and these two agreements has proved complex. Whereas the TRIPS Agreement legitimises IP protection and thus the monopolization of plant genetic resources, the FAO and CBD treaties both recognize national sovereignty over them. Whereas the CBD suggests bilateral arrangements for facilitating access to genetic resources, the FAO Treaty aims to create a multilateral system and provide a framework for sharing benefits and burdens among countries. A key issue in the FAO Treaty is whether it should be possible to claim IP rights that limit access to the plant genetic resources covered by the Treaty. Under the CBD, IP is only explicitly referred to in the context of technology transfer, yet IP policy is frequently discussed with respect to such topics as access to genetic resources, benefit-sharing and the knowledge, innovation and practices of indigenous and local communities.

Geographical indications

A second area of IP policy relevant to food, agriculture and biodiversity is geographical indications (GIs). The TRIPS Agreement defines GIs as “indications, which identify a good as originating in the territory of a Member, or a region or locality in that territory, where a given quality, reputation, or other characteristic of the good is essentially attributable to its geographical origin”. In other words, geographical indications can help to identify and differentiate products on the market. They can also help establish a special link between the origin of a product and its quality, reputation or special characteristics, all of which can make a significant difference to the profitability and long-term commercial viability of a particular product. The TRIPS Agreement makes a distinction in term of the protection offered to wines and spirits and that provided to other products.

At the Doha Ministerial, Members agreed to pursue discussions regarding the extension of GIs to new products. The European Union and the Swiss Governments are among those that are keen to promote GIs; they highlight a range of potential benefits for developing countries, particularly for rural economic development. For some developing countries, there is also a strong interest in expanding the scope of geographical indications so that protection can apply to a broader range of products. There is hope that the ability to market products based on their geographical origin (and preventing others from using reference to that same geographical region) will allow some commercial producers from developing countries to differentiate some of their agricultural and other products on international markets. In particular, there is a hope that the use of GI protection will help those communities that maintain long-standing, collective production practices to reap greater economic returns for their efforts.

On the other hand, some countries, including developing countries, fear the extension of GIs. They are concerned that requirements such as "authenticity" and "origin" may become barriers to entry into niche sub-markets for particular classes of their exports. Some developing countries argue that, compared to developed countries, they have a smaller number of GIs that could benefit from the extension of GIs, in part because so many of their local products are deemed generic in developed countries. Some developing countries already involved in free and fair product imitation also fear that they will suffer losses from market closures due to the extension of GIs.

At present, however, the potential of geographical indications for developing countries is somewhat speculative because this type of IPR has been used only in a few countries outside Europe. Many GIs have only small markets and relatively few are traded internationally. Evidence from Europe suggests that successful commercialisation and use of GIs depends on coordination between firms within the products' supply chains and on effective public support for establishing and monitoring product quality standards. In addition, there is considerable need for product marketing and promotion as well as market information, particularly for the foreign markets to which the products are to be exported.

Traditional knowledge and folklore

Traditional peoples and communities in developing countries are responsible for the discovery, development and preservation of a wide range of medicinal plants, health-giving herbal formulations, and agricultural and forest products. Traditional knowledge (TK) is also used as an input into modern industries such as pharmaceuticals, botanical medicines, cosmetics and toiletries, agriculture and biological pesticides. While estimating the full monetary value of TK is extremely complex, there is no doubt about its contribution to food security, employment, livelihoods and exports in developing countries. In addition, a great deal of TK has a cultural or spiritual value that cannot be quantified in any monetary sense.

As discussed in chapter 8, in general, intellectual property policies fail to account adequately for traditional knowledge. Since the early 1990s, developing countries and holders of TK have pushed for greater acknowledgement in international IP policies and laws of its value and origin. Frequently, multinationals and researchers in developed countries use TK without the permission, consent or knowledge of local traditional communities and fail to share the subsequent economic benefits on fair terms with them. Others neglect to ask permission to use the cultural expressions of indigenous communities and fail to acknowledge the source of the creativity, even passing off productions and works as authentic expressions or products when they are not. Some communities complain that knowledge and/or cultural expressions of special sacred or religious significance are commercialised in ways that they find offensive or morally wrong. Several developing-country governments have launched challenges to patents granted in developing countries on "inventions" which have been in the public domain in their countries for centuries.

TK is now a specific topic in international discussions. In Doha, WTO Members agreed to examine the relationship between TRIPS and the protection of traditional knowledge and folklore. Similarly, in 2000, the WIPO General Assembly established an Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore. The CBD has work under way on TK and IP-related issues under the auspices of its Working Group on Article 8j. This article requires, among other actions, that the Parties respect, preserve, and maintain knowledge, innovations and practices of indigenous and local communities, and encourage the equitable sharing of the benefits arising from their utilization. The FAO's new ITPGR also refers to measures governments should take regarding the protection of TK. Lastly, UNCTAD has conducted work aimed at improving the protection of traditional knowledge, and WHO has a programme promoting traditional medicines, and the fair and equitable sharing of benefits that derive from them.

Several specific issues are under discussion at the international level. The first issue concerns prior art. While precise provisions vary from country to country, most national IP systems consider traditional knowledge, no matter where it is from in the world, as the property of nobody. That is, they assume that traditional knowledge is in the public domain. One potential remedy is to enable patent offices to conduct more effective prior art searches. To this end, some developing-country governments are working to establish national and/or local databases of TK. Some are collaborating with WIPO to improve the accessibility of information held in those databases. Many indigenous groups agree that databases can help patent examiners to filter out spurious inventions. However, they argue that registration of TK must not proceed without the consent of the TK holders, and that databases must be maintained locally and remain under the control of indigenous communities. A related policy priority for many developing countries is for all countries to require disclosure of information in patent applications regarding the geographical source of genetic resources from which the invention is derived.

While most indigenous and local traditional communities appear to support efforts to improve intellectual property laws to better protect them against the misuse and misappropriation of their knowledge, efforts to use existing laws or to design new laws to advance new positive protection of their knowledge have been attracting more controversy. Past experience of misappropriation, means that many indigenous communities tend to be hostile towards patent regimes and feel powerless to challenge invalid patents. For many indigenous peoples, the idea that one group or company, even their own community, could claim exclusive rights over inventions derived from genetic resources violates their value systems and customs. Communities that are interested in pursuing protection for their inventions often encounter problems relating to compliance with the traditional standards of patentability; they also lack sufficient resources for applying for patents and for enforcement of their patents.

Conceivably, a considerable amount of TK could be protected under trade secrecy law. While the sharing of knowledge is common in many traditional societies, healers and other specialist

knowledge holders as well as clans and lineage groups are likely to have knowledge that they would not wish to share with anybody. If desired, the trade secret could, for example, be stored in a close-access database, and then be disclosed to companies with benefit-sharing guaranteed through a standard contract, enabling the economic benefits to be shared appropriately with the community.

Some governments have called for *sui generis* systems for the protection of TK that would take adequate account of its distinctive nature. Most indigenous peoples argue that *sui generis* systems can and should draw from customary laws. The customary laws that indigenous peoples possess typically include local systems of jurisprudence regarding classification of different types of knowledge, proper procedures for acquiring and sharing knowledge, and the rights and responsibilities which attach to possessing knowledge, all of which are embedded uniquely in each culture, its language and the environment. In general, most countries fail to acknowledge customary laws, let alone with respect to indigenous knowledge and IP matters, but some countries are increasingly (and successfully) taking customary laws into account. While there are many common principles and values that indigenous communities share, the intricacies and sheer diversity of traditional customary laws makes it unlikely that any single form of collective IP or international law on traditional knowledge could be effectively designed.

Access to knowledge and educational, technical and scientific information

For developing countries, IP policy considerations are emerging as important variables in public education, and also in the capacity to conduct technical and scientific research and development. In the education and scientific sphere, developing countries rely on information in the form of foreign publications, academic journals (digital and non-digital), teaching and research software, electronic databases and Internet access. From a development perspective, there are concerns that recent trends in IP policy are constraining access to knowledge and to educational, scientific and technical information vital for building local capacity for scientific R&D and innovation in developing countries. Companies are also employing controversial new technological and contractual strategies to strengthen the traditional protection of their investment provided by IP policy. Developing country governments are in the difficult position of striking an appropriate balance between their need to ensure access to information and knowledge and their commitments to comply with international treaties. Chapter 9 explores a range of copyright policy options and exceptions developing countries could consider, and also draws attention to the contribution that differential pricing might make.

On the education front, a critical IP-related issue for developing countries is the ability to copy and distribute texts that are beyond the reach of most developing-country pupils and public school systems. Price is not just an issue with regard to access to foreign publications, but also for local publications for schools, universities and research in general. The growing

interest in distance education in many developing countries, as a way of reaching rural and poor communities, has also drawn attention to IP policies associated with the Internet, teaching software and other related communication technologies.

For developing countries, it is important that concepts such as “fair use” (as it is called in the United States) or “fair dealing” (in United Kingdom and other Commonwealth jurisdictions) are fully utilized. These provisions establish exceptions to copyright, authorizing the use of protected works under certain conditions (notably copies for private, non-commercial purposes, and for public archives and libraries). Recent trends in national legislation around the world, however, reveal pressure to reduce or exclude the possibility of fair use, even though it is permitted in international copyright instruments such as the Berne Convention and the 1996 WIPO Copyright Treaty (WCT). In addition, an appendix to the Berne Convention includes some special provisions targeting developing countries, to facilitate ease of translation for the purpose of teaching, scholarship or research, and reproduction for use in instructional activities. However, owing to the many restrictions and qualifications in these provisions, only a few developing countries are currently availing themselves of the options available.

Along with efforts to maintain fair use opportunities for developing countries, there is growing attention to the need to reconsider the design of “collecting societies” (these organizations are practical instruments to collect fees from rights users and to distribute the revenues to rights holders) to ensure that they do not act in an anti-competitive manner, and that the costs of establishing and operating such agencies are borne by copyright holders, particularly *foreign* copyright holders, who have proven to be the main direct beneficiaries of these societies.

The WCT obliges parties to implement laws that will provide protection against the circumvention of technological measures used by authors and producers to prevent the unauthorized copying of their works or access to their works. These provisions were developed in response to concerns from both authors and publishers arising from the growing difficulties they face in controlling the dissemination and use of their works over the Internet, and to enforce their exclusive rights. The Digital Millennium Copyright Act (of the United States) (DMCA) goes beyond the WCT to make illegal any act circumventing encryption technologies; even in cases traditionally considered legal under the “fair use” provision. Interestingly, the DMCA also provides several examples of exceptions that developing countries may want to consider for their national implementation laws, such as for non-profit libraries, law enforcement, reverse engineering to make software inter-operable, encryption research, and technology used to control Internet access by minors.

Finally, scientific research and technological advancement depend on the free exchange of knowledge across national boundaries. However, access to such knowledge is increasingly restricted by a combination of IPRs and regulations to enhance national competitiveness in

the developed countries. Copyright policies, for example, are implemented in ways that make scientific publications and journals for developing-country scientists and engineers increasingly unaffordable. In particular, the hard copies of scientific journals are being replaced by expensive, subscription-based electronic formats, which creates difficulties for many researchers in accessing cutting-edge knowledge, data and ideas.

Similarly, new efforts to develop IP protection for databases of information also jeopardize affordable access to a vast range of data potentially contained and organized in protected databases. The introduction of the EU's *sui generis* database protection regime, for example, provides database creators the right to prevent extraction of the whole or a substantial part of the contents of the database for a period of 15 years (the term of protection is renewable whenever substantial changes to the database are made, e.g. by adding new data. While the precise implications remain unclear, developing-country research institutions and universities could face further constraints on affordable access to knowledge, particularly as more and more information is converted into electronic databases and made accessible only through Internet channels.

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GLOBAL INSTITUTIONAL ISSUES

Part One provides an overview of the nature and significance of intellectual property rights (IPRs) and their evolution over time. It goes on to present the key features of the framework of the global intellectual property regulatory system and the international institutions that form its core. The most important of these institutions are the World Trade Organization (WTO) and the World Intellectual Property Organization (WIPO). The TRIPS Agreement is of special importance in that it seeks to establish enforceable universal standards of protection and enforcement for virtually all of the most important IPRs such as patents, copyrights and trademarks.

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Introduction

The first chapter provides a general background to the understanding of intellectual property rights by considering, among others, what purpose they serve, their rationale and justification, a brief review of the past and present rights regimes, and, finally, the relevance of IPRs to commerce.

What are intellectual property rights and what purpose do they serve?

Intellectual property rights (IPRs) are legal and institutional devices to protect creations of the mind such as inventions, works of art and literature, and designs. They protect products by differentiating them from similar ones sold by competitors through the use of distinguishing marks. Over the years, the rather elastic concept of IPRs has been stretched to include not only patents, copyright, industrial designs and trademarks, but also trade secrets, plant

breeders' rights, geographical indications, and rights to layout-designs of integrated circuits. (Box 1.1 describes the main categories of IPRs). Of these, patents, copyright and trademarks are arguably the most significant in terms of their economic importance, their historical role in the industrialization of Europe and North America, and their current standing as major pillars of the international law on intellectual property rights.

Intellectual property rights are legal and institutional devices to protect creations of the mind

Box 1.1: Main categories of IPRs

Patents provide inventors with the right to prevent others from using, selling or importing their inventions for a fixed period (minimum of 20 years under TRIPS). They do not, however, replace marketing approvals that may be required under national law. Applicants for a patent must satisfy a national patent-issuing authority that the invention described in the application is new, susceptible to industrial application (or merely 'useful' in the United States), and that its creation involved an inventive step or would not be obvious to someone skilled in the art represented by the claimed invention.

Copyright gives authors legal protection for various kinds of literary and artistic work. Copyright law protects authors by granting them exclusive rights¹ to sell copies of their work in whatever tangible form (e.g. printed publication, sound recording and/or film) is being used to convey their creative expressions to the public. In theory, legal protection covers the expression of the ideas contained, not the ideas themselves. In practice, information may also be protected, as when copyright is extended to cover new types of work such as software programs and databases. The right usually lasts for the life of the author plus 50 years, though in some jurisdictions, such as the European Union (EU) member countries and the United States, this has been extended to 70 years.

Trademarks are marketing tools used to support a company's claim that its products or services are authentic or distinctive compared with similar products or services of competitors. They usually consist of a distinctive design, word, or series of words placed on a product label. In some jurisdictions, sounds, shapes and smells can also be protected as trademarks. Normally trademarks can be renewed indefinitely, though this is likely to be subject to continued use. The trademark owner has the exclusive right to prevent third parties from using identical or similar marks in the sale of identical or similar classes of goods or services that might confuse customers.

Utility models are a form of patent protection for minor or incremental inventions. Though novelty and inventiveness are required, the criteria for conferring protection are generally less strict than for patents, and the term of protection is also shorter. The rationale behind utility models is to encourage and protect inventions that do not meet the stricter requirements of patent protection, but that are nevertheless considered beneficial to the society. Utility models protect the *functional* aspect of a product, generally in the mechanical field, and not its outward appearance (as in industrial designs). There is no universal consensus as to what constitutes a utility model, and the lack of international harmonization means that most countries refer to such protection under different names: petty patents, small patents, utility certificates, innovation certificates and utility innovations.

Industrial designs concern the protection of the *outer appearance* of a product. A "design" connotes an element or characteristic completely separate from the object it enhances or to which it is applied. As with utility models, there are no international common standards for design protection. States are therefore free to protect designs under copyright law or under *sui generis* design law. Most *sui generis*- design laws in the world are fashioned upon patent law. Usually, the design is registered (or deposited) and thereby granted protection, if it meets a novelty criterion (ranging from domestic novelty to universal novelty). The proprietor of the design thus has the right to prevent any third person from producing an identical or similar design, even if the latter design arises from an independent creation. The term of protection is usually shorter than under patent law (minimum of 10 years under TRIPS). Under an unregistered *sui generis* design right, protection is conferred automatically.

Geographical indications (GIs) are indications which identify a good as originating in the territory of a WTO Member, or a region or locality in that territory, where a given quality, reputation or other characteristic of the good is essentially attributable to its geographical origin (Article 22.1 TRIPS Agreement). GIs confer upon right holders the right to prevent third parties from using the protected indication, if such use misleads the public as to the geographical origin of the good or if such use constitutes an act of unfair competition. In case of wines and spirits, the right holder is conferred the same right if the respective good does not originate in the place indicated by the geographical indication in question, even if there is no consumer confusion or act of unfair competition. WTO Members are free as to make available the legal means for such protection. Some Members provide for a *sui generis* form of protection, while others apply their domestic rules on collective marks or certification marks.

Collective marks belong to an association or group whose members are entitled to use that mark to indicate the origin (possibly including a geographic name) of a product. There are substantial differences in the way that collective marks are regulated by national law. Thus each country may determine the particular conditions under which a collective mark shall be protected, and may refuse protection if the mark is contrary to the public interest (see Article 7.2 *bis* of the Paris Convention).

Certification marks belong to a certifying person or body which, by affixing or allowing the affixing of the mark, would provide assurance with a set of rules or qualifications. The rationale behind this is the maintenance of a certain quality of the certified products. As with collective marks, countries are free as to determine the conditions of protection.

Trade secrets provide for another form of protection for commercially valuable information such as production methods or business plans. They are protected from disclosure by dishonest means but, once they are learned through legitimate means, they enter the public domain.

Source: UNCTAD-ICTSD, *Resource Book*

Intellectual property rights have never been as much in the news as they are today

Several IPR-related issues have caused controversy. For example, drug companies have been accused of taking advantage of their patent rights by charging exorbitant prices for life-saving medicines such as AIDS drugs. Indigenous peoples, and advocacy groups that support their rights, condemn corporate “biopirates” for making money out of their knowledge and claiming patent rights for ‘inventions’ essentially identical to knowledge acquired from tribal healers. Concerns are raised that patenting plants, animals, genes and gene fragments is not only unethical but may also be stifling innovation. Many developing countries complain about the pressure they feel from being made to introduce Western-style IPR regimes before they feel ready for them, and worry

that this places them at a serious disadvantage in an era of rapid technological change. And while the global trend is towards ever-stronger enforcement of intellectual property rights, increasingly determined efforts are being made to oppose this process.

Thus there are far-reaching potential economic and social implications of IPRs, and the stakes have never been higher than they are today. Increasing numbers of people have begun to recognise this. Consequently, despite their long history, public interest in IPRs worldwide has reached unprecedented levels, and views on their effects differ quite radically.²

Box 1.2: The Commission on Intellectual Property Rights

In September 2002, the Commission on Intellectual Property Rights, established by DFID and chaired by Professor John Barton, published a report entitled, *Integrating Intellectual Property Rights and Development Policy*. The Commission was mandated to look at how IPRs might work better for poor people and developing countries by providing balanced, evidence-based policy recommendations. The document contains some fairly far-reaching recommendations directed at the global IPR system and the institutions within it, as well as national IPR policy-making. It covers the following six areas: intellectual property and development; health; agriculture and genetic resources; traditional knowledge, access and benefit sharing, and geographical indications; copyright, software and the Internet; and patent reform.

Overall, the Commission made an overwhelming case that a one-size-fits-all approach to IPR protection simply does not work, especially when the required levels of protection are as high as they are today or are likely to become in the near future. At certain stages of development, weak levels of IPR protection are more likely to stimulate economic development and poverty alleviation than strong levels. The Commission presents well-documented historical evidence to support this view. Available empirical data is, as the Commission reveals, somewhat lacking at present; but what exists points to the same conclusion.

The Commissioners presented strong evidence for their critical stance with respect to the international IPR regime, but at the same time avoided the error of treating developing countries as a homogeneous group of countries. Rather they argued that due to their different scientific and technological capacities and social and economic structures, an optimal IPR system is bound to vary widely from one country to another. For example, developing countries that have relatively advanced scientific and technological capacities, such as China and India, may well benefit from high levels of IPR protection in some areas, whereas the least-developed countries almost certainly will not.

Among the recommendations relating to particularly controversial matters are that developing countries should establish workable laws and procedures to allow them to use compulsory licensing and, in some cases, to provide for government use in order to improve, for example, access to urgently needed medicines. As for the patenting of life, the Commission recommended that developing countries should not provide patent protection for plants and animals and should be permitted to develop *sui generis* systems for plant varieties that suit their agricultural systems. With respect to traditional knowledge and genetic resources, the Commission recommended that all countries should provide in their legislation for the obligatory disclosure in patent applications of the geographic source of genetic resources from which the invention is derived. One important recommendation, related specifically to least developed countries, is that they should be granted an extended transition period for implementation of all TRIPS obligations until at least 2016.

IPRs have been created primarily to benefit society. A major IPRs policy issue today is what levels of IPR protection bring benefits, to whom and in which societies, and also whether current pressures on developing countries to adopt higher standards are appropriate for their development needs.

One could argue - as many do - that the recent trends in IPR protection, as discussed here, are necessary responses to technological change. While there is probably much truth in this, technological changes are so varied in nature, depending on the

industrial sector, that a uniform and general strengthening of IPRs is not necessarily the appropriate response. More fundamentally, it is far from self-evident that the existence of strong IPR protection is a precondition for the transformation of developing country economies into developed ones. The Commission on Intellectual Property Rights established by the United Kingdom's Department for International Development (DFID), which produced its final report in September 2002, has provided important evidence in this respect (box 1.2).³

What are the justifications for the granting of exclusive rights?

Traditionally, IPRs - especially patents and copyright - have been justified on both consequentialist and rights-based grounds. These are not mutually exclusive, since some arguments contain elements of both.⁴

The consequentialist justification is that when inventors, authors or artists have an exclusive right to prevent others from reproducing and selling their works, society benefits. This proposition is based on two assumptions. First, it assumes that such a right encourages inventors to invent, authors to write and artists to paint. Second, it presupposes that the greater the quantity of inventions and creative works eventually released into the public domain, the more the public benefits through economic or cultural enrichment, or enhanced quality of life. Thus advocates of this justification tend to argue that IPRs are *incentives* that encourage creative endeavour.

According to rights-based justifications for IPRs, property in intellectual works is primarily a matter of justice rather than of public policy. IPR laws exist to define and enforce the property rights but are not the source of these rights, since to enjoy a property right over one's creative work is a natural right and, arguably, also a human right. According to such a view unauthorized use of somebody's invention or creative work is an unfair - and therefore illegal - intrusion on the creator-proprietor's freedom to benefit from its use without interference. This justification does not of course easily apply to the many cases where IPRs are owned by companies and not individuals.

Consequentialist justifications have inspired national IPR laws and policy-making far more than rights-based ones.⁵ For example, the original role of the United States patent and copyright systems was to implement Article 1 Section 8 of the United States Constitution, which empowers Congress "to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." Thus United States IPR law was not founded on a natural-rights justification of intellectual property ownership. Rather, the granting of exclusive rights *for limited times* was regarded as being beneficial to the country in terms of scientific and cultural progress.

But the consequentialist approach that IPRs exist to bring benefits to society does not tell us much about the ends that IPRs are meant to serve nor how those ends ought to be achieved. In general terms, IPRs - especially patents - are tools for economic advancement that should contribute to the enrichment of society through:

- (i) the widest possible availability of new and useful goods, services and technical information that derive from inventive activity; and
- (ii) the highest possible level of economic activity based on the production, circulation and further development of such goods, services and information.

In pursuit of these aims, inventors are able to protect their inventions through a system of property

IPRs are tools for economic advancement that should contribute to the enrichment of society

rights – the patent system. Once acquired, the owners then seek to exploit their rights in the marketplace. The possibility of attaining commercial benefits, it is believed, encourages invention and innovation (see chapter 3 below). But after a certain period of time, these rights are terminated and the resulting unprotected inventions are freely available for others to use and improve upon. Enhancing the society's capacity to generate such useful goods, services and information is itself a means for achieving such ends (and may, it could be argued, be a sufficient end in itself). But it is not the only means. After all, these could also be imported, and legal incentives could be created for such imports, as they were in the past.

Philosophy is not enough to explain why we have IPRs, except in general terms. Economics too is helpful, not only for identifying the specific problems that IPRs are meant to solve, but also for helping policy makers design IPR systems to fulfil their intended objectives. In economic terms, patents and copyright are primarily intended to resolve market failure. The main issue is that economically useful knowledge or culturally enriching works are likely to be expensive to produce and market as well as difficult to control in a competitive market. Therefore, in the absence of any regulations to prevent "free-riding", those capable of providing such knowledge or works are likely to be discouraged not only from investing in its production, but also from publicly disclosing it. This is why economists often portray intellectual property rights, especially patents, as a kind of regulatory response to the failure of the free market to achieve optimal resource allocation for inventions. According to such a perspective, "patents are designed to create a market for knowledge by assigning proprietary rights to innovators which enable them to overcome the problem of non-excludability while, at the same time, encouraging the maximum diffusion of knowledge by making it public."⁶ This explanation for patents assumes that knowledge is a public good (box 1.3).

Patents are temporary exclusionary rights. Such rights can be converted into market monopolies if the invention so protected results in a commercial product or process. The public goods explanation for patents posits that the possibility of acquiring such rights encourages both investment in invention and the R&D needed to turn inventions into marketable

innovations. Information about the invention as revealed in the patent and by the invention itself is, in the bargain, diffused throughout the economy. In this context, it is helpful to conceive of a patent as a contract between the holder and the government on behalf of the citizenry. The holder receives an exclusive right over his or her invention in exchange for the payment of fees and, more importantly, for disclosing the invention for others to learn from. Without a patent, the inventor would have no incentive to disclose it, resulting in a loss to society if such lack of protection left the inventor with no alternative but to keep it secret.

Box 1.3: Knowledge as a public good

The notion that knowledge is a public good was nicely articulated by Thomas Jefferson who wrote in a letter that the "peculiar character" of an idea is that "the moment it is divulged, it forces itself into the possession of everyone, and the receiver cannot dispossess himself of it", and also that "no one possesses the less, because every other possesses the whole of it". He then went on to explain that "he who receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine receives light without darkening me".

Why create markets for knowledge? Why are they considered to be beneficial, and how are patents supposed to create them? Often, patent holders are poorly placed to exploit their invention in the marketplace. For example, a creative but small company might lack the funds to develop and commercialise new products based upon its inventions. If such products were desirable for consumers, failure to commercialise would be a loss to society. But if the company owned a patent, a wealthier company might wish to license or buy the patent, secure in the knowledge that the invention was legally protected. And if the invention were kept secret, how would bigger companies know about it? The disclosure of patent information makes it possible for prospective users to find inventions of interest and then to approach their owners.

However, several studies⁷ caution against assuming that inventions are necessarily discrete and independent. In reality, they tend to be cumulative and dependent.⁸ Moreover, reproducing them may

Patents and copyright are primarily intended to resolve market failure

IP incentive functions by restricting use by others of the protected invention for a certain period

depend on tacit knowledge, which cannot easily be documented in written form, such as in a patent specification, and is therefore available only to the inventor. Also, as is sometimes pointed out, in some cases, other means of appropriation are not only possible, but may actually be more effective than IPRs. These include marketing, customer-support services, goodwill, and the advantage that comes with being first to bring inventions to market.⁹ The fact that intellectual works are not necessarily public goods makes it extremely difficult, if not

Why are patents controversial?

One of the reasons that patents are controversial is that the IP incentive - as far as it actually works - functions by restricting use by others of the protected invention for a certain period. Yet follow-on innovation by others is more likely to happen if use is not restricted. Thus a balance needs to be struck between private control over the use of technical information and its diffusion. Where the line - in terms of the length, breadth and strength of protection - should be drawn is difficult to determine, but will vary widely from one country to another. In countries where little inventive activity takes place, free access to technical information may well do more to foster technological capacity building than providing strong private rights over such information. In fact, technological capacity building may, at certain stages of national development, be best achieved by requiring foreign technology holders to transfer their technologies on generous terms, rather than by trying to encourage domestic innovation by making strong legal rights available to all.¹¹ This suggests that some developing countries should be careful not to make the rights too strong until their economies are more advanced. Historical evidence suggests that several of today's

What about other IPRs?

The discussion so far has focused on the economics of the patent and copyright system. Other IPRs, such as trademarks, can also be justified on economic grounds, but in different ways. Trademarks make products identifiable from similar products available in the market, and encourage producers to strive to maintain the value of their marks. According to Maskus, "trademark protection may be expected

impossible, to determine an optimal level of protection for achieving an optimal allocation of resources for inventive activities. The difficulty for policy makers is compounded by the task of ensuring that protection is effective, but not so strong as to unduly restrict the freedoms of follow-on innovators. It has also been suggested that while patents encourage disclosure of an invention, they may, paradoxically, also encourage secrecy.¹⁰ (This is discussed further in chapter 4.)

developed countries, rightly or wrongly, took such a policy decision in the past.¹²

The task of designing IPR systems to stimulate the development and dissemination of new technologies would be much easier if policy makers could predict the trajectory of their future development, especially in an era of rapid technological advances such as the present one. This is always difficult, but especially for developing countries, which lack the data necessary for designing patent systems that most efficiently stimulate the *long-term* development and dissemination of new welfare-enhancing products and technologies.

In short, patents and other IPRs are intended to balance different aims and interests in order to most effectively achieve certain public policy goals. Striking an optimum balance is extremely difficult. IPRs may not be sufficiently protective, but they could also be over-protective. However, it is important to understand that balancing the interests of present and future creators, users of intellectual property and the public is not just a matter of economic calculation; it is an inherently political exercise.

both to raise the average quality of products on the market and to generate further product differentiation" (see chapter 4 for further discussion).¹³ Thus consumers and producers stand to benefit. But this view is not universally held. Concerns have been raised about trademarks (as with other IPRs) being used in ways that intrude on the legitimate freedoms of others. For example, companies sometimes

protect fundamental market tools, such as shapes or descriptive words, that might be vital for competitors; or drug companies sometimes seek to combine trademark protection with the filing of large numbers of patents to extend the monopoly, or at least the market dominance, of a drug well beyond

the life of the original patent protecting it. In other words, a mixture of different types of IPRs can be, and are, used as part of the strategy firms adopt to develop and maintain market power or market dominance.

Intellectual property rights: past and present

Like many other systems of economic regulation, intellectual property rights have a history going back centuries.¹⁴ But the main IPRs, such as patents and copyright, took their modern forms in the nineteenth century at a time when Europe and North America were in the midst of rapid industrialization.

Over the years, patents have been granted for a variety of public policy purposes such as to encourage the immigration of craftsmen, to reward importers of foreign technologies, to reward inventors in general, to create incentives for further inventive activity, to encourage the dissemination of new knowledge¹⁵, and to allow corporations to recoup their investments in R&D. From a public policy perspective, each of these justifications is as legiti-

mate as the others. Which of these is most appropriate for a country depends largely on its economic circumstances. Historically, and even today, the way patents have been justified in different countries has depended on the level of industrial development - and also to whom one speaks. Nonetheless, as with other forms of intellectual property (especially copyright), justice-based arguments for stronger and better enforced rights are also frequently deployed, and such claims can carry strong moral force. After all, many people would consider it just as immoral for somebody to copy an inventor's useful new gadget and claim it as his or her own as to similarly misappropriate somebody's new novel, song or painting.

The first IP statutes

The first patent law for the protection of inventions was passed by the Venetians during the Renaissance. Another early patent law was the English Statute of Monopolies of 1624. Its true purpose was to prohibit monopolies rather than to promote invention, and the government intended the law to encourage foreign craftsmen to settle in the country.¹⁶ Monopoly grants were banned, *except* for "the true and first inventor or inventors" of "any manner of new manufactures within this realm" as long as "they be not contrary to the law, nor mischievous to the state, by raising prices of commodities at home, or hurt of trade, or generally inconvenient." Such inventors could acquire up to 14 years' monopoly protection. Strict novelty was not required, since courts interpreted the purpose of granting patents as being to introduce new trades to England whether or not they were "novel" elsewhere in the world.¹⁷ It should be noted in this context that at this time England was less advanced technologically than both

France and the Netherlands.¹⁸ The Statute was amended several times, but remained in force until 1977, when Britain adopted the standards of the European Patent Convention, including its requirement of absolute (i.e. global) novelty.¹⁹

The 1836 United States Patent Act²⁰ was arguably the first modern patent law. It required all applications to be examined by the government patent office for novelty and usefulness. Although this law did not discriminate between United States and foreign inventors with respect to the examination or the extent of rights granted, foreign applicants had to pay much higher fees, especially if they were British. Such discrimination was abolished in 1861 for nationals of countries whose laws were non-discriminatory towards Americans.

The German Patent Act²¹ of 1877 was also an examination system.²² In common with many countries

The way patents have been justified in different countries has depended on the level of industrial development

today, it did not cover inventions deemed contrary to public order or morality. Patenting of inventions regarding luxuries, medicines, articles of food, or chemical products was also prohibited. Some other European countries managed without a patent law for much of the nineteenth century. Switzerland had a patent system only from 1799 to 1802,²³ not re-establishing it until 1888, and the Netherlands prohibited patents from 1869 until 1912.²⁴

As with patents, the origin of copyright can be traced to Renaissance Italy, although the most famous early copyright law is probably the English Statute of Anne of 1710.²⁵ Early copyright law was associated with the interests of domestic printers rather than authors. While its intent was both to prevent unauthorized printing, reprinting and publishing of books and writings and to encourage “learned men to compose and write useful books”,

It is not until the nineteenth century that copyright law took its modern form

Emergence of modern IP statutes

As with patent law, it is not until the nineteenth century that copyright law took its modern form. During this century, the protection term increased, the law began to accumulate a wider range of subject matters and international agreements began to proliferate, with the result that national standards became more harmonized and opportunities to secure stronger protection of creative works in more countries were greatly enhanced. These trends have continued. With respect to subject matters, for example, United Kingdom copyright law had, by 1988,²⁹ been stretched to include literary and dramatic works (including computer programs), musical works, artistic works, sound recordings, films, broadcasts, cable programmes, typographical arrangements, and computer-generated works. And protection was not only economic in nature, but, following continental tradition and the requirements of the Berne Convention for the Protection of Literary and Artistic Works, also included authors’ moral rights. Moral rights include the right of authors to be identified as such (the “right of paternity”), and to object to having their works altered in ways that would prejudice their reputation (“the right of integrity”).

Historically, national copyright laws have generally been less friendly towards the interests of foreigners

the Statute of Anne was primarily the outcome of a campaign by an association of printers (the Company of Stationers) to reassert its control over the English book trade, rather than a law to uphold the rights of authors. Nonetheless, for the first time, this statute did recognize that authors could be proprietors of their works.²⁶ It provided a time-limited right to print and reprint books whose titles were entered in the register book of the Company of Stationers. According to the economic historian, Paul David,²⁷ “copyright law, from the beginning, has been shaped more by the economics of publication than by the economics of authorship.” Nevertheless, copyright law in continental Europe displayed much more concern for the artistic integrity of authors than did the Anglo-American copyright regulations.²⁸ The time limitation, as with patents, reflects the need to balance the rights of publishers and authors with the interests of the community.

than have patent laws. This is because, while granting rights to foreigners has sometimes been considered beneficial to the country by encouraging the introduction of protected technologies, allowing foreigners to protect their literary and artistic works does not provide such obvious economic advantages.³⁰ For example, for many years United States copyright law contained a so-called “manufacturing clause”, which originally required all copyrighted literary works to be printed in the country. This was a protectionist measure intended to benefit American printers. Although the clause was weakened over the years, it remained on the statute books until as late as 1986.

Most countries that experienced industrial revolutions during the nineteenth century had patent systems. But, as pointed out above, Switzerland and the Netherlands were exceptions to this general rule. What can be concluded from this? While it is probably true that patent systems did indeed stimulate the development and diffusion of new technologies that were the foundation for rapid industrial development,³¹ it does not prove that they were indispensable. Since we cannot turn the clock back and re-run the nineteenth or twentieth centuries without a patent system there is much that we will never be sure of. But few if any of these early

patent systems would come close to compatibility with the World Trade Organization's TRIPS Agreement, which seeks to establish enforceable universal minimum (and high) standards of protection and enforcement for virtually all of the most important IPRs.³² For one thing, those earlier agreements tended to be biased towards domestic inventors and users of foreign technologies. And for another, the rights given to holders were generally quite weak by modern standards. Regardless of the relevance of

historical experience, it is necessary to recognize that the world has changed considerably in the last 100 years, particularly with respect to the emergence of new technologies and a more integrated and open trading system. However, under these circumstances, developing countries today no longer have the policy options and flexibilities developed countries had in using IPRs to support their national development.

Developing countries no longer have the policy options and flexibilities developed countries had

The international system and the evolution of IPR regimes

While national IPR regulations (in some countries) have existed for two or more centuries, the history of intellectual property at the international level really began in the late nineteenth century, with the formation in the 1880s of unions, mostly in European countries, for the protection of industrial property and literary and artistic works. Previously the only instruments for international protection had been based on bilateral commercial agreements involving mainly European countries.³³ The process of expanding international IPR regulation has continued since then, to the extent that most countries of the world are now involved. In recent decades, the evolution of developed-country IPR regimes has been characterized by three phenomena:

1. The extending of protectable subject matter

The parameters of protectable subject matter have been widened, and there has been a growing tendency to reduce or eliminate exceptions. Examples include the extension of copyright and patent protection to computer programs, the application of patent protection to cover business methods, life-forms, cell lines and DNA sequences, the removal of

exclusions on product patents for drugs, and the extension of trademark protection in some countries to include sounds and smells.

2. The creation of new rights

Examples of new systems of rights, created mostly during the second half of the twentieth century, include plant breeders' rights, rights to layout-designs of integrated circuits, rights related to copyright such as performers' rights, and, most recently, Internet communication access rights.

3. The progressive standardization of the basic features of IPRs

For instance, patent regulations provide 20-year protection terms under TRIPS; require examinations for novelty, inventive step or non-obviousness, and industrial applications;³⁴ assign rights to the first applicant rather than the first inventor;³⁵ and provide protection for inventions in all industries and fields of technology. Also, the duration of rights related to performances and sound recordings has been set by TRIPS at 50 years for performers and 20 years for broadcasting organizations.

International extension and gradualism

These developments in IPR law, all of which began in Europe or North America, are spreading to the rest of the world, and at an accelerating pace. Two of the major driving forces have been the Paris and Berne Conventions. During the 1960s and 1970s, 33 developing countries joined the Paris Convention for the Protection of Industrial Property, and 25 joined the Berne Convention for the Protection of Literary and Artistic Works. Consequently, national IPR regimes throughout the world are increasingly

required to harmonize minimum standards of protection. These, however, remain a long way from uniform law.

It should not be assumed, though, that the developments referred to above were introduced gradually over time, even in the developed world. In fact, many of the examples cited above were introduced into national IPR regimes from the 1960s onwards. For example, until the 1960s several West European

countries, including France, Belgium and Italy, still granted patents on the basis of registration.³⁶ Moreover, the bar to patentability of pharmaceutical products in several developed countries was lifted only in the 1960s or 1970s.³⁷ And other important extensions of protectable subject matter are even more recent, such as the patenting of animals and

DNA sequences, and the sui generis protection of integrated circuit layout-designs. At the same time, a few developing countries have moved in the reverse direction. For example, in the late 1960s and early 1970s Brazil and India passed laws to exclude pharmaceuticals as such from patentability (as well as processes to manufacture them in Brazil's case).

Technological change creates new opportunities for private appropriation, but also poses new challenges

Why intellectual property is important to international trade

The commercial importance of IPRs has grown considerably, especially since the 1970s. Those national economies in which most IPR-holding corporations are concentrated have experienced a transformation in the composition of their exports in manufactures. Since 1970, for most developed countries, the contribution of advanced technologies to economic performance in terms of manufacturing value-added and exports has increased substantially (table 1.1).

One reason for this situation is the incessant and increasing pressure on businesses and national economies to be competitive. This puts a premium on innovation and creativity, aimed at developing new products and services and at differentiating existing ones from those of competitors. Perhaps the most important of these advanced technologies are information and communications technology (ICT) and those based upon the applied life sciences (see chapter 4, below). Both have multiple industrial applications, and are of interest to companies operating in a wide range of product and service markets. Thus, in addition to the commercial interests responsible for innovating in such fields as software, telecommunications, pharmaceutical and biotechnology companies, many other business sectors deploy these technologies including producers and providers of computers and other electronic goods, music, television programmes, films, printed works and financial services, to name a few.

Technological change creates new opportunities for private appropriation, but also poses new challenges. One of these challenges is the threat of "free-riding", which certain new technologies may facilitate. IP protection helps to maximize these opportunities for private appropriation while mini-

mizing the risks of potential "free-riding". Thus many companies operating in all the above sectors hold large intellectual property portfolios to protect products and services developed with these technologies. Indeed, for these businesses, the high market value of their goods and services may be due largely to such IPR-protectable, intangible inputs as technical knowledge and artistic creativity, or attributes such as reputation and distinctiveness. Such businesses assert these rights with great determination. After all, developing, applying and benefiting commercially from such inputs and attributes can involve enormous expenditures on R&D and marketing. Moreover, despite the market dominance of knowledge-rich corporations, they are also highly vulnerable. While the marginal cost of manufacturing such goods as software packages, compact discs and videos is extremely low, so is the marginal and fixed cost of copying them. Multiple reproduction of similar quality of these goods is now possible with low-cost equipment and minimal (if any) technical know-how. In countries where IPRs such as patents, copyrights and trademarks are unavailable or enforcement is weak, imitators can quickly and inexpensively copy these products and sell them domestically and in other countries where IPR protection is also weak. Similarly plant breeding companies can find their non-hybrid plant varieties being sold without their consent. Even though entry barriers for generic drug firms are higher in that they require competent chemists and more expensive equipment for bulk production than, for example, software and compact disc piracy, the free-riding problem that research-based drug companies face is also potentially serious. However, while IP protection is important for minimizing potential free-riding, it could also reinforce economic concentration and market power and

create opportunities for anti-competitive behaviour, whether by individual firms or by concerted practices or agreements among firms. For these reasons, a number of industrialized countries have legislated antitrust rules concerning the use of IPRs.³⁸

In addition to their possible effect on competition, IPRs may also have important repercussions on the international flow of protected goods and services. The protection in a given country of a company's

R&D investments through IPRs may induce that company to export its products to that country, thereby increasing the international flow of trade. In this respect, there is a positive link between IPR protection and trade. On the other hand, IPR-holders may block imports if those infringe upon their domestic exclusive rights.³⁹ In that sense, there is a negative link between IPR protection and trade, with IPRs acting as trade barriers.

Table 1.1: Share of high-technology goods in manufacturing value-added and exports in selected high-income economies

	Value-added		Exports	
	1970	1994	1970	1993
Australia	8.9	12.2	2.8	10.3
Canada	10.2	12.6	9.0	13.4
France	12.8	18.7	14.0	24.2
Germany	15.3	20.1	15.8	21.4
Italy	13.3	12.9	12.7	15.3
Japan	16.4	22.2	20.2	36.7
United Kingdom	16.6	22.2	17.1	32.6
United States	18.2	24.2	25.9	37.3

Source: World Bank, *World Development Report: Knowledge for Development, 1998/99*, Washington, DC: World Bank, 1999:24.

As for technology ownership, a similar story of developed country - especially United States - interest in high levels of IPR protection can be inferred from the relevant statistics. It is not only IPR-protected *products, technologies* and *services* that are major exports of developed countries such as the United States, but also the *rights* themselves, in the form of licences to use patented processes, techniques and designs, copyrights, trademarks and franchises. According to Ryan,⁴⁰ "U.S. multinational manufacturing enterprises increasingly transfer intellectual property internationally through the industrial processes that they sell abroad. Exports, as measured by royalties and licensing fees, amounted to about U.S.\$27 billion in 1995, while imports amounted to only U.S.\$6.3 billion. At least U.S.\$20 billion of the exports are transactions between U.S. firms and their foreign affiliates."⁴¹ This balance-of-payments surplus is far higher than for any other country.

Interestingly, most of the major industrialized countries do not have a similar balance-of-payments surplus for royalties and licence fees. According to figures from the International Monetary Fund (IMF) for 1995,⁴² the United Kingdom is one of the few which also enjoyed a surplus, but it was far smaller than that of the United States (\$1.71 billion compared with \$20.66 billion). Countries with sizeable deficits included not only large developing countries such as India (\$68 million in 1992) and Brazil (\$497 million), but also major economic and technological powers such as Japan (\$3.35 billion) and Germany (\$2.66 billion). The explanation for this is that "German and Japanese firms exploit their technological advantage mainly through exports, whilst U.S. and U.K. firms rely much more on direct foreign investment, which results in a higher volume of measured royalty income."⁴³ Thus Germany and Japan have just as much - if not identical - reason as the United States and the United Kingdom to favour strong and enforceable IPR protection in overseas markets.

Most of the major industrialized countries do not have a similar balance-of-payments surplus for royalties and licence fees

*The implications
of IP protection
go well beyond
commerce*

Such figures give an idea of the static gains and losses to different countries of IP protection, and of the extent to which their interests are likely to vary. But clearly they do not tell the whole story; more work is needed, to estimate not only static gains (and possible losses), but also the projected dynamic efficiency gains of stronger IP protection, especially for developing countries (see further discussion in chapter 5 on transfer of technology).

Finally, it should be noted that despite the existing links between IPRs and trade, the implications of IP protection go well beyond commerce. IPRs equally affect a number of social and cultural areas that are of considerable importance to developing countries. An in-depth analysis of these challenges is presented in Part Three of this paper.

CHAPTER 1: END NOTES

- ¹ Though in some cases the rights may be restricted by statutory licences.
- ² For some examples of such differing views, see, on the one hand, Kumar, N, “Intellectual Property Rights, Technology and Economic Development. Experiences of Asian Countries”, in *Economic and Political Weekly*, Vol. XXXVIII, No. 3, January 18, 2003; and Médecins Sans Frontières/Drugs for the Neglected Diseases Working Group, “Fatal Imbalance. The Crisis in Research and Development for Drugs for Neglected Diseases”, Geneva, 2001; on the other hand: International Federation of Pharmaceutical Manufacturers Associations, “Encouraging Pharmaceutical R&D in Developing Countries”, Geneva, 2003.
- ³ Report of the Commission on Intellectual Property Rights, “Integrating Intellectual Property Rights and Development Policy”, London, September 2002 [hereinafter Report of the IPR Commission]. Available at: http://www.iprcommission.org/graphic/documents/final_report.htm.
- ⁴ For example, the view that IPRs are *rewards* for inventors and artists for their contribution to the public good.
- ⁵ This generalization holds in spite of the tradition in much of continental Europe of “authors’ rights” (as opposed to Anglo-American copyright), which suggests the predominance of natural rights over utilitarianism.
- ⁶ Geroski, P, “Markets for technology: knowledge, innovation and appropriability”, in Stoneman, P (ed.), *Handbook of the Economics of Innovation and Technological Change*, Oxford and Malden: Blackwell, 1995: 97.
- ⁷ For example, Merges, RP, and Nelson, RR, “On the complex economics of patent scope”, *Columbia Law Review*, 90, 1990: 839-916; Scotchmer, S, “Standing on the shoulders of giants: cumulative research and the patent law”, *Journal of Economic Perspectives*, 5 (1), 1991: 29-41.
- ⁸ Menell, PS, “The challenges of reforming intellectual property protection for computer software”, *Columbia Law Review*, 94 (8), 1994: 2644-2654.
- ⁹ See Levin, RC, Klevorick, AK, Nelson, RR and Winter, SG, “Appropriating the returns from industrial research and development”, *Brookings Papers on Economic Activity*, 1987: 783-820.
- ¹⁰ According to David (2002), “although the disclosure of codified information is augmented by patent systems, so is the inducement to curtail the transmission of tacit knowledge that might reduce the commercial value of the patents that have been issued”. David, PA, “The political economy of public science”, Lawton-Smith H (ed.), “*The Regulation of Science and Technology*”, Basingstoke and New York: Palgrave, 2002.
- ¹¹ This point applies to those developing countries that have attained a reasonable capacity to adopt and benefit from such technologies. Countries with very limited capacity have little to gain from free access to advanced technologies.
- ¹² See Lall, S, with Albaladejo, M., “Indicators of the relevant importance of IPRs in developing countries”, 2002; and Kim L, “Technology Transfer and Intellectual Property Rights: Lessons from Korea’s Experience”, 2002, part of the UNCTAD/ICTSD Capacity Building Project on IPRs and Sustainable Development. Both papers are available at <http://www.ictsd.org/iprsonline/unctadictsd/projectoutputs.htm#casestudies>.
- ¹³ Maskus, K, “Intellectual Property Rights in the Global Economy”, Washington DC: Institute for International Economics, 2000.
- ¹⁴ See Braithwaite, J and Drahos P, “Global Business Regulation”, Cambridge: Cambridge University Press, 2000.
- ¹⁵ The idea that patent applicants should disclose their inventions and that the dissemination of technical information, and not the finished product alone, is the inventor’s part of the “bargain” was introduced into patent law from the late eighteenth century following an English legal decision (see Merges, RP, “Patent Law and Policy: Cases and Materials” (second edition), Charlottesville: Michie Law Publishers, 1997: 657).
- ¹⁶ MacLeod, C, “The paradoxes of patenting: invention and its diffusion in 18th and 19th century Britain, France, and North America”, *Technology and Culture* 32 (4), 1991: 885-911.
- ¹⁷ Webster, T, “Reports and Notes of Cases on Letters Patent for Inventions”, London: Thomas Blenkarn, 1844: 756-757.

- ¹⁸ Cornish, WR, "Intellectual Property: Patents, Copyright, Trade Marks and Allied Rights" (fourth edition), London: Sweet and Maxwell, 1999: 111.
- ¹⁹ See Bercovitz-Rodriguez, A, "Historical Trends in Protection of Technology in Developed Countries and their Relevance for Developing Countries", Geneva: United Nations Conference on Trade and Development, 1990: 2-3.
- ²⁰ Officially titled "An act to promote the progress of useful arts, and to repeal all acts and parts of acts heretofore made for that purpose".
- ²¹ In German, "Reichspatentgesetz".
- ²² As opposed to a registration system.
- ²³ Dessementet, F, "Intellectual Property Law in Switzerland", The Hague, London and Bern: Kluwer Law International and Stämpfli, 2000:23.
- ²⁴ Schiff, E, "Industrialization Without Patents: The Netherlands, 1869-1912, Switzerland, 1850-1907", Princeton: Princeton University Press, 1971.
- ²⁵ Officially, "An act for the encouragement of learning, by vesting the copies of printed books in the author's or purchaser of such copies, during the times therein mentioned".
- ²⁶ Rose, M, "Authors and Owners: The Invention of Copyright", Cambridge and London: Harvard University Press, 1993:4; Sherman, B, and Bentley L, "The Making of Modern Intellectual Property Law: The British Experience, 1760-1911", Cambridge: Cambridge University Press, 1999: 11-12.
- ²⁷ David, P, "Intellectual property institutions and the panda's thumb: patents, copyrights, and trade secrets in economic theory and history", in Wallerstein, MB, Schoen, RA and Mogee ME (eds), *Global Dimensions of Intellectual Property Rights in Science and Technology*, Washington, DC: National Academy Press, 1993.
- ²⁸ Cornish op cit: 343.
- ²⁹ By virtue of the Copyright, Designs and Patents Act 1988.
- ³⁰ Cornish op cit: 48, 50.
- ³¹ For well-researched and convincing evidence to support this view in the United Kingdom context, see Dutton, HI, "The Patent System and Inventive Activity during the Industrial Revolution, 1750-1852", Manchester: Manchester University Press, 1984.
- ³² These are: copyright and related rights; trademarks; geographical indications; industrial designs; patents; layout-designs of integrated circuits; and protection of undisclosed information (trade secrets). Among the few IPRs excluded from TRIPS are utility models and plant breeders' rights (although plant varieties must be protected, whether through patents or an alternative system such as UPOV-style plant breeders' rights or a combination thereof).
- ³³ 69 bilateral industrial property-related conventions to protect the rights of foreigners were signed between 1859 and 1883 (Ladas, S. (1930), "The International Protection of Industrial Property". Volume 1, Cambridge: Harvard University Press:54-57). All parties to these conventions were either European, North American or Latin American, but the vast majority were European countries.
- ³⁴ Albeit with some exceptions, even in Europe. The Netherlands and Switzerland do not require prior art searches. In France, novelty examinations were introduced only in 1960 for pharmaceutical patents, and gradually since 1968 with respect to other inventions.
- ³⁵ The United States is the only country still to have a first-to-invent system (as opposed to first-to-file).
- ³⁶ Robbins, LJ, "The proposed new European patent", *The Patent, Trademark, and Copyright Journal of Research and Education* 5 (3), 1961: 217-232. In France pharmaceutical patents were examined for novelty from 1960, and novelty examinations for other types of invention were phased in from 1968 (Lynfield, HG, "The new French patent law", *IDEA* 13 (2), 1969: 201-210).
- ³⁷ For example, France in 1960, Germany in 1968, Japan in 1976, Switzerland in 1977, Italy and Sweden in 1978, and Spain in 1992.

- ³⁸ See Part Three of the UNCTAD-ICTSD “Resource Book on TRIPS and Development” (2003), under preparation [hereinafter *Resource Book*].
- ³⁹ For instance, the importation of generic drugs from countries that do not yet recognize drug patents may be prevented by the holder of a corresponding drug patent in a country recognizing such patents.
- ⁴⁰ Ryan, MP, “Knowledge Diplomacy: Global Competition and the Politics of Intellectual Property”, Washington DC: Brookings Institution Press, 1998: 2.
- ⁴¹ According to UNCTAD, if data for the United States and Germany are indicative, some four-fifths of technology payments take place between parent firms and their affiliates. See *World Investment Report 1997*: 21.
- ⁴² In Maskus, K, “The role of intellectual property rights in encouraging foreign direct investment and technology transfer”, *Duke Journal of Comparative and International Law* 9 (1), 1998: 109-161.
- ⁴³ Patel, P, and Pavitt, K, “Patterns of technological activity: their measurement and interpretation”, in Stoneman, P (ed.), *Handbook of the Economics of Innovation and Technological Change*, Oxford and Malden: Blackwell, 1995: 24.

2

The Global Intellectual Property Rights System

2

The issues raised about the effects of national and international IPRs regimes on major social, economic and political objectives of States do not simply relate to legal, technical questions. They also concern aspects such as justice and equity, the processes of rule-making and regulation in this area, how to improve the participation of a broad range of interests and so ensure the balance sought, as well as the capacity of different parties to effectively take part. The increasingly global nature of the IPRs system has given even more urgency to these concerns. This chapter therefore seeks to explain the different components of the global architecture for IPRs, while highlighting its intricacies and the challenges faced by developing countries in coping with it.

The global architecture for IPRs

The global architecture of the IPRs regime has become increasingly complex,¹ and includes a diversity of multilateral agreements, international organizations, regional conventions and instruments,² and bilateral arrangements. In brief, the international law on intellectual property, in its

present form, consists of three types of agreement: multilateral treaties (see box 2.1), regional treaties or instruments, and bilateral treaties.³ Of these, the agreements that affect the greatest number of countries are the TRIPS Agreement and some of the multilateral treaties administered by WIPO. One of

The international law on intellectual property consists of three types of agreement

Box 2.1: Multilateral treaties

Most of these agreements are administered by WIPO, and are of three types:

1. **Standard-setting treaties**, which define agreed basic standards of protection for the different IPRs, and also typically require national treatment. These include the 1883 Paris Convention for the Protection of Industrial Property, the 1886 Berne Convention for the Protection of Literary and Artistic Works, the 1961 Rome Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations, the 1996 WIPO Copyright Treaty and the WIPO Performances and Phonograms Treaty. Important non-WIPO treaties of this kind include UNESCO's 1952 Universal Copyright Convention, the 1961 International Convention for the Protection of New Varieties of Plants (the UPOV Convention), and the WTO-administered TRIPS Agreement.
2. **Global protection system treaties**, which facilitate filing or registering of IPRs in more than one country. These include the 1970 Patent Cooperation Treaty, the 1891 Madrid Agreement Concerning the International Registration of Marks, and the 1958 Lisbon Agreement for the Protection of Appellations of Origin and their International Registration.
3. **Classification treaties**, which "organize information concerning inventions, trademarks and industrial designs into indexed, manageable structures for easy retrieval". These include the 1957 Nice Agreement Concerning the International Classification of Goods and Services for the Purposes of the Registration of Marks, the 1968 Locarno Agreement Establishing an International Classification for Industrial Designs, and the 1971 Strasbourg Agreement Concerning the International Patent Classification.

WIPO's main objectives is "to promote the protection of intellectual property throughout the world through cooperation among States and, where appropriate, in collaboration with any other international organization".⁴ *Regional* agreements (or for that matter bilateral agreements) are also extremely important. First, their membership may be quite large, covering 20 or more countries. Second, it is possible that novel provisions in such agreements could subsequently be globalised through their incorporation into new multilateral agreements.⁵ Third, developing countries may be required to introduce provisions that go beyond what the TRIPS Agreement requires, such as extending patents to new kinds of subject matter and eliminating certain exceptions. Fourth, the most-favoured-nation (MFN)

treatment obligation (see below) obligates, in general, WTO Members to extend such "TRIPS-plus" provisions in regional agreements to all other WTO Members.⁶ Thus, regional standards might have a direct impact on the global IPRs architecture.⁷ Fifth, regional agreements might stipulate that contracting Parties should accede to certain international conventions. The above points might also apply to bilateral agreements.

The subsequent sections of this chapter deal, respectively, with the emergence of TRIPS, its central features, TRIPS-related developments in WTO, new treaty development and harmonization and the international law on plant genetic resources.

The emergence of TRIPS

Many developing countries have been ambivalent, if not hostile, to TRIPS from the beginning. Nonetheless, in 1986 developing country Parties to the General Agreement on Tariffs and Trade (GATT) accepted the Punta del Este Declaration, whose apparently quite limited aspirations were primarily to "clarify GATT provisions" relating to IPRs and counterfeit goods, and to "develop a multilateral framework of principles, rules and disciplines dealing with international trade in counterfeit goods."⁸ By 1989, the situation changed radically, with developing countries dropping their earlier resistance to a substantive agreement on IPRs that would ultimately form part of a package of agreements covering various trade issues such as agriculture, textiles and services.

On the face of it, this is puzzling, especially considering that a certain number of relatively industrialized developing countries had reformed their IP systems a decade earlier in order to facilitate imitation and capacity building by their domestic firms.⁹ Why did developing countries, many of which seem to be as dubious today as they were in 1986 about the trade-relatedness of IPRs, agree to abide by such a comprehensive agreement that sets high minimum standards of protection and enforcement?

There are two plausible ways to interpret this change of attitude. Both of these emphasize the important role of pro-IPR business associations and lobby groups as well as the threat of unilateral trade action against those countries not ready to upgrade their IP standards and enforcement procedures. The first is that developing countries were willing to accept the whole WTO package of agreements out of a conviction that the benefits of the other Uruguay Round Agreements would outweigh the economic and social costs of TRIPS. In short, TRIPS was considered a loss, but the WTO package was perceived as a net gain. Alternatively, developing countries might have considered TRIPS and the WTO Agreements as a whole to be unsatisfactory, but had little choice but to accept it since the carrot of improved access to developed country markets was irresistible, and the stick of strengthened trade barriers, and even unilateral sanctions, expected to result from a refusal to raise IPR standards, was to be avoided at all costs. Accordingly, the establishment of the WTO was at that time welcome because they expected that it would insulate them from the aggressive unilateralism being adopted by some developed countries.

TRIPS was considered a loss, but the WTO package was perceived as a net gain

“Trade-related” intellectual property rights: from WIPO to the GATT

The first attempt to frame IPRs as a trade-related issue was made by a group of trademark-holding firms organized as the Anti-Counterfeiting Coalition, which unsuccessfully lobbied for the inclusion of an anti-counterfeiting code in the 1973-1979 GATT Tokyo Round.¹⁰ Nonetheless, this initiative attracted the interest of the United States and the European Community in drafting such a code and in gaining support for doing so from a few other countries.

Following the lead set by the United States trademark industries, the copyright, patent and semiconductor industries also decided during the early 1980s to make the relative (and sometimes absolute) lack of effective IPR protection in overseas markets a trade-related issue, portraying it as a problem for the United States economy that the Government ought to resolve. Thus, by the time the contracting parties of the GATT met in Punta del Este to launch another trade round, a broad cross-sectoral alliance had been forged that had developed a coordinated strategy.

For those seeking high standards of IPR protection and enforcement throughout the world by way of the GATT, the strategy had three advantages. First, if successful it would globalise these standards much more rapidly than could be achieved through the WIPO-administered conventions. This is because it allowed for the possibility of including all the main IPRs in a single agreement (which could also incorporate, by reference, provisions of the major WIPO conventions), and, because once it was agreed that the Uruguay Round agreements had to be accepted as a package (i.e. a “single undertaking”), countries seeking membership of the WTO could not opt out of any one of them. Second, the GATT already had a dispute settlement mechanism. WIPO has no enforcement or dispute settlement mechanisms except through the treaties that it administers, and these treaties do not provide much recourse for countries concerned about the non-compliance of other parties. Third, the broad agenda of the Uruguay Round provided opportunities for linkage-bargain diplomacy that WIPO, with its exclusive focus on IPRs, did not allow. Hard bargaining by the United States, Europe and Japan on IPRs could thus be linked to concessions in such areas as textiles and agriculture, where exporting countries in the

developing world were eager to achieve favourable agreements.¹¹

The reason why the United States was predisposed to identifying the interests of these groups with its national interests is closely linked to a feeling held by many people during the 1980s that the country was losing its technological lead.¹² In large part this was due to increasing competition from other countries, especially Japan in various high-technology sectors, and low-wage, newly industrializing economies such as the Republic of Korea, Taiwan Province of China and (though not strictly an NIE) China. Many of these sectors had hitherto been dominated by the United States. This was generally felt to be attributable to unfair trade, investment and industrial policies, including intellectual property and technology licensing regulations. These allegedly reserved domestic markets for local firms, while helping those countries to export their goods in massive quantities to the United States, and, consequently, to enjoy sizeable trade surpluses. A related complaint was that those countries were condoning what was seen as blatant and widespread intellectual property piracy.

The support of European and Japanese business was necessary for any proposal on IPRs at Punta del Este to succeed. Consequently, United States business interests, under the umbrella of the Intellectual Property Committee (IPC), forged an alliance with their European and Japanese counterparts: the Union of Industrial and Employers’ Confederations of Europe (UNICE) and Keidanren.

Even so, it is not only developing country governments that were dissatisfied with TRIPS. Many firms, including the pharmaceutical transnationals, were unhappy about the compromises and concessions achieved by developing countries, such as the transition periods. Neither were the life science businesses satisfied with the compromises between the United States and Europe that, among other things, permitted exclusions on the patenting of plants and animals. And many developed countries would like TRIPS to be revised in order to better accommodate technological advances that have taken place since the conclusion of the Uruguay Round.¹³ It is not surprising, then, that the United States Congress has

The broad agenda of the Uruguay Round provided opportunities for linkage-bargain diplomacy

not renounced unilateral trade action and reserves the right of the United States Trade Representative (USTR) to initiate bilateral negotiations with

countries whose IPR standards may be TRIPS-compatible but nevertheless lower than those of the United States.¹⁴

What purpose does TRIPS serve?

While the original purpose of an agreement on IPRs proposed at the start of the Uruguay Round negotiations was to prevent the trade in “counterfeit goods” (see box 2.2 for a clarification of this and related terms), the resulting agreement turned out to be much more ambitious.¹⁵ Since it is difficult to judge the success of the Agreement or evaluate its

future prospects without a clear idea of its objectives, we seek here to identify the main objectives of the TRIPS Agreement. (See also annex A for key issues and salient features of the Agreement. For a detailed analysis and technical background, see the ongoing UNCTAD-ICTSD work on a Resource Book on TRIPS and Development.¹⁶)

Box 2.2: Copying IPR-protected goods and services: fair following or free-riding?¹⁷

The TRIPS Agreement provides the following definitions of counterfeit trademark goods and pirated copyright goods¹⁸:

1. “Counterfeit trademark goods” shall mean any goods, including packaging, bearing without authorization a trademark which is identical to the trademark validly registered in respect of such goods, or which cannot be distinguished in its essential aspects from such a trademark, and which thereby infringes the rights of the owner of the trademark in question under the law of the country of importation;
2. “Pirated copyright goods” shall mean any goods which are copies made without the consent of the right holder or person duly authorized by the right holder in the country of production and which are made directly or indirectly from an article where the making of that copy would have constituted an infringement of a copyright or a related right under the law of the country of importation.”

‘Counterfeiting’ and ‘piracy’ are normally considered to be both morally wrong and illegal. Yet in countries where products do not have IPR protection, either because such protection has not been applied for or because it is unavailable anyway, the production and domestic circulation of such goods by others do not constitute IPR infringements. Therefore if counterfeiting and piracy are illegal by definition, these words do not apply to such acts. Because of this situation, the copyright and trademark industries have sought to reduce opportunities for free-riding by eradicating the copying of valuable products and marks wherever it takes place. They have tried to do this by lobbying and pressuring governments to: (i) ensure that legal means are available so that as much copying as possible can be classed as illegal counterfeiting or piracy; (ii) to bind as many countries as possible to the legal obligation to provide such means; and (iii) to ensure that these laws are enforced.

However, free-riding or imitation is not necessarily wrong, and may even be creative in itself. Indeed, it may even be necessary, albeit within reasonable limits. According to Kim and Nelson, “imitation ranges from illegal duplicates of popular products to truly creative new products that are merely inspired by a pioneering brand”.¹⁹ Distinct imitations may include “knockoffs or clones, design copies, creative adaptations, technological leapfrogging, and adaptation to another industry”.²⁰ In fact, history shows that becoming good at imitating through, for example, reverse engineering, is a vital stage in the process of becoming innovative. Copying CDs and misappropriation of trademarks provides no scope at all for learning. Moreover, if it is too easy to profit from uncreative imitation, there is unlikely to be much incentive to innovate. But the situation may be quite different for the manufacture of products that requires the application of complex processes whose operation and adaptation to local conditions may need high levels of knowledge and skill.

The preamble to the TRIPS Agreement affirms the desire of member States “to tak[e] into account the need to promote effective and adequate protection of intellectual property rights”, while “recognizing the underlying public policy objectives of national systems for the protection of intellectual property, including developmental and technological objectives”. “Effective” implies enforceable. But whether IPR protection is “adequate” depends largely on what the systems of rights are supposed to achieve.

Dealing with counterfeiting is clearly considered as important, mainly because trade in counterfeit goods is what makes intellectual property most clearly trade-related. The preamble indicates that members recognize “the need for a multilateral framework of principles, rules and disciplines dealing with international trade in counterfeit goods”.

And yet the objectives, as stated in Article 7 (see box 2.3), make no reference to the eradication of counterfeiting. Rather, TRIPS is explicitly aimed at promoting public policy objectives, the nature of such objectives presumably being left to be determined by national governments, though technological development is given priority.

Evidently, TRIPS is not only supposed to establish effective legal remedies to prevent unauthorized copying, but also to stimulate technological advancement. TRIPS thus appears to give greater priority to economic development than to the eradication of the trade in counterfeit goods, which had been the original motive for wanting such an

National and most-favoured-nation treatment

By virtue of TRIPS Article 3, Members accept the principle of national treatment, i.e. that each country must treat nationals of other Members at least as well as it treats its own nationals. In other words, IPR protection and enforcement must be non-discriminatory as to the nationality of rights holders. This principle is in fact well established in international law, dating back to the nineteenth century.²¹

National treatment should be contrasted with the principle of reciprocity, according to which rights or concessions are available only to foreigners from countries that provide the same rights or concessions. Foreigners from other countries are unable to

avail themselves of protection according to this principle. The United States applied the principle of reciprocity rather than national treatment when it enacted its 1984 Semiconductor Chip Protection Act, as did the EU with its 1996 Directive on the Legal Protection of Databases.²² UPOV 1978 also contains a reciprocity provision, as opposed to UPOV 1991.²³ Application of the reciprocity principle to the IPRs covered by TRIPS is clearly contrary to the Agreement.

Box 2.3: Objectives of the TRIPS Agreement

Article 7 provides that the protection and enforcement of intellectual property right should:

- contribute to the promotion of technological innovation; and
- to the transfer and dissemination of technology

and be:

- to the mutual advantage of producers and users of technological knowledge;
- in a manner conducive to social and economic welfare; and
- to a balance of rights and obligations.

In addition, Article 8.1 allows Members implementing their IPR regulations to “adopt measures necessary to protect human health and nutrition, and to promote the public interest in sectors of vital importance to their socio-economic and technological development”. These measures are not obligatory, but again they highlight the socio-economic welfare implications of IPRs. On the other hand, the proviso that such measures be consistent with the provisions of TRIPS appears to narrow their possible scope quite considerably.

TRIPS is explicitly aimed at promoting public policy objectives

Article 4 upholds the principle of most favoured nation (MFN). This means that any concession granted by one Member to another must be accorded

**TRIPS is the first
multilateral IPR
treaty that refers to
MFN**

to all other Members “immediately and unconditionally”. Thus if country A agrees to take special measures to prevent the copying of the products of a company from country B, but turns a blind eye when the company is from country C, D or E, such

inconsistency of treatment will violate this principle. Although this principle of international law has long been established in history, TRIPS is the first multilateral IPR treaty that refers to it.

Table 2.1: Main dates concerning the application of the TRIPS Agreement

Final Act of the results of the Uruguay Round	14.04.1994
Entry into force of the WTO Agreement	01.01.1995
Special arrangements for pharmaceuticals and agricultural chemical products not protected in a member country as of the date of entry into force of the Agreement (Article 70.8-9)	
a. Providing means for filing applications	01.01.1995
b. Criteria for patentability (to be applied as of the time that patent protection has become available in the country in question)	01.01.1995
c. Domestic legislation enabling the granting of exclusive marketing rights (EMRs) (EMRs to be granted once all conditions of Article 70.9 are met)	01.01.1995
Entry into force of TRIPS Agreement (Article 65.1)	01.01.1996
National treatment principles applicable to all countries	01.01.1996
Most-favoured-nation treatment applicable to all countries (Article 4)	01.01.1996
Review of issue of patentability of plants and animals other than micro-organisms (Article 27.3(b))	01.01.1999
Transitional arrangement for developing countries (Article 65.2)	01.01.2000
Transitional arrangement for economies in transition, but only if conditions of Article 65.3 are met	01.01.2000
Review and amendment by Council for TRIPS (Article 71.1)	2000 ⇒ ⇒
Transitional arrangement for developing countries concerning product patent protection - to technologies not previously protected by product patents (Article 65.4)	01.01.2005
Transitional arrangements for least developed countries (Article 66.1)	01.01.2006
Transitional arrangements for least developed countries concerning patent protection for pharmaceutical products and legal protection of undisclosed test data submitted as a condition of approving the marketing of pharmaceuticals (Paragraph 7 of the Declaration on the TRIPS Agreement and Public Health)	01.01.2016

Source: UNCTAD 1996:35 (with update) *op. cit.*

Transitional arrangements

All countries were to apply Articles 3 (National Treatment), 4 (Most-Favoured-Nation Treatment) and 5 (Multilateral Agreements on Acquisition or Maintenance of Protection) within one year of the entry into force of the WTO Agreement. But the developing countries and the former centrally-planned socialist States were allowed a period of five years to apply its full provisions (i.e. 1 January 2000). In addition, developing country members that were required to extend patent product protection to areas of technology not hitherto covered in their laws were permitted to delay such extension until 1

January 2005. The least developed countries were allowed until 1 January 2006 to apply TRIPS in full. Upon request to the Council for TRIPS, they may also be granted further extensions of this period. The 2001 Doha Declaration on the TRIPS Agreement and Public Health allows least developed countries to delay implementation of patent protection for pharmaceutical products, and legal protection of undisclosed test data submitted as a condition of approving the marketing of pharmaceuticals, until 1 January 2016 (box 4.2). (Table 2.1 shows the main dates for the implementation of the Agreement).

National enforcement and administration: challenges

TRIPS places much emphasis on enforcement. With respect to the general enforcement obligations, procedures should be available that “permit effective action against any act of infringement” of IPRs.²⁴ They must be fair, equitable and not unnecessarily complicated, costly or time-consuming.²⁵ The judicial authorities must be granted the power to require infringers to pay damages adequate to compensate the right holder for the injury suffered due to the infringement.²⁶ Members are required to provide for criminal procedures and penalties “at least in cases of wilful trademark counterfeiting or copyright piracy on a commercial scale”.²⁷ Remedies may include imprisonment and/or monetary fines. Such remedies may also be applied in other cases of IPR infringement if done “wilfully and on a commercial scale”. Members are not required to put in place a judicial system for enforcing IPRs separate from that for the enforcement of law in general.²⁸ Moreover, TRIPS creates no obligation to shift resources away from general law enforcement towards the enforcement of IPRs. Nonetheless, resource-poor countries may face a difficult dilemma when determining how to allocate their scarce resources.

The dynamic efficiencies of stronger and more effective IPR systems may more than make up for the administrative and enforcement costs. Whether or not this turns out to be true, the costs must be borne before the benefits accrue and, for least-

developed countries especially, these are likely to be particularly onerous. In addition, since regulators and courts in many developing countries are likely to lack experience in dealing with IPR-related matters, they will need financial and appropriate technical assistance.

Tables 2.2 and 2.3 should make this point apparent. The first table gives details of a few World Bank-financed capacity building projects including their costs. The second table provides a list of reforms needed by developing country WTO Members, along with the estimated costs involved.

One serious problem that needs to be addressed is the lack of a sufficient number of qualified examiners in many developing countries to handle a high volume of patent applications. Therefore, national patent offices accumulate large backlogs of unexamined applications, especially in the most advanced technological fields. A number of solutions are possible. One is to join with neighbouring countries to set up a regional patent registration office. Another is to conduct only cursory examinations or to opt for a registration system without any examinations. However, if this happened, the quality of issued patents could become very poor and it could lead to the granting of broad patents thus reducing the public domain.²⁹ A third possibility is to accept search and examination reports from other patent offices.

***Enforcement costs
must be borne
before the benefits
accrue***

Table 2.2: Sample of IPR-related projects of the World Bank, with costs

Country	Project description	Cost
Brazil, 1997-2002	Train staff administering IP laws - component of Science and Technology Reform project	\$4.0 million
Indonesia, 1997-2003	Improve IPR regulatory framework - component of Information Infrastructure Development project	\$14.7 million
Mexico, 1992-1996	Establish agency to implement industrial property laws - component of Science and Technology Infrastructure project	\$32.1 million

Source: Finger, JM and Schuler, P, "Implementation of Uruguay Round commitments: the development challenge", World Bank Development Research Group, Policy Research Working Paper 2215, Washington, DC, World Bank, October 1999.

Table 2.3: Estimates of IPR reform in selected developing countries

Country	Reforms needed	Cost
Bangladesh	Draft new laws, improve enforcement	\$250,000 one-time plus \$1.1 million annually
Chile	Draft new laws, train staff administering IP laws	\$718,000 one-time plus \$837,000 annually
Egypt	Train staff administering IP laws	\$1.8 million
India	Modernize patent office	\$5.9 million
United Republic of Tanzania	Draft new laws, develop enforcement capability	\$1.0-1.5 million

Source: UNCTAD, 1996, *op.cit.*

TRIPS-related developments at the WTO

At the Doha Ministerial Conference in November 2001, the WTO Members agreed on the texts of three statements: the Ministerial Declaration, the Declaration on the TRIPS Agreement and Public Health (see chapter 6 and box 6.3), and the Decision on Implementation-related Issues and Concerns.³⁰ In the Ministerial Declaration, Members agreed "to negotiate the establishment of a multilateral system of notification and registration of geographical indications for wines and spirits by the Fifth Session of the Ministerial Conference". With respect to the extension of the protection of geographical indications to products other than wines and spirits, it was agreed

that issues related to this matter would be addressed in the Council for TRIPS (see chapter 7 and box 7.4). As part of its work programme, including its reviews of Article 27.3(b) and of the implementation of the whole Agreement under Article 71.1, the Council was requested to examine the relationship between TRIPS and the CBD, and the protection of traditional knowledge and folklore (see chapter 8 for further discussion). In a brief section on trade and transfer of technology, there was agreement to establish a Working Group to examine "the relationship between trade and transfer of technology, and of any possible recommendations on

steps that might be taken within the mandate of the WTO to increase flows of technology to developing countries.” Clearly, this is an IPR-related issue.

The Decision on Implementation-related Issues and Concerns reaffirmed the mandatory nature of Article 66.2 (“Developed country Members shall provide incentives to enterprises and institutions in their territories for the purpose of promoting and encouraging technology transfer to least-developed country Members in order to enable them to create a sound and viable technological base”). The TRIPS Council was directed to establish “a mechanism for ensuring the monitoring and full implementation of the obligations in question”.³¹

TRIPS is clearly unfinished business. Many developed countries would like to progressively raise the standards. Some developing countries accept the

Agreement as it is and seek to construe its rules as creatively as possible. Others would like TRIPS to be revised to lower the standards. On the one hand, developed countries have softened their stance and have decided to focus for the time being on implementation of the existing standards, rather than seeking to raise them further (though some of the countries have been actively promoting their preferred interpretations of these existing standards). And while many countries have failed to meet the built-in implementation deadlines, such as the requirement to provide protection for plant varieties by 2000, they are not being challenged at the WTO for this at present. On the other hand, a number of industrialized countries have responded by encouraging developing countries to raise their IPR standards *beyond* those required by TRIPS, *outside the WTO*, such as through bilateral treaties.³²

TRIPS is unfinished business

Beyond TRIPS: new developments and harmonization

IPRs are dynamic regulatory systems; the TRIPS Agreement is not set in stone, and discussions are taking place that may well lead to revisions of the text. Moreover, in addition to TRIPS, two other overlapping developments are affecting the evolution of substantive IPR law at the international and national levels. The first is the development of new IPR standards, ostensibly to accommodate technological advances. To this end, since TRIPS entered into force, a number of new multilateral IPR treaties

have been negotiated and adopted. The second is the harmonization of substantive IPR law. This is occurring through both bilateral treaties and through international and bilateral technical cooperation. Bilateral treaties between developed and developing countries tend to require standards of protection to be on the same level as the developed country party, and with fewer exceptions. With regard to international and bilateral technical cooperation, there are concerns that such cooperation does not fully take into account the development needs of the beneficiary countries or the flexibilities allowed to them under TRIPS.³³

Another emerging force for harmonization in the area of patent law is WIPO’s draft Substantive Patent Law Treaty, which, if adopted, will make the patent systems of the world more like each other, using those of the technologically most advanced countries as the models.

The effects of the development of new IPR standards and harmonization overlap in the sense that both are raising the minimum IPR standards above the levels of the TRIPS Agreement and are therefore “TRIPS plus”. The implications for developing countries are twofold. First, their options are being *rapidly* narrowed. Second, because they have to be aware of related developments taking place in a wide range of forums and know where their national interests lie with respect to each of these, the development of coherent, effective and sustainable policies and negotiating strategies on IPRs is becoming more difficult than ever before. Ensuring consistency between the positions adopted at the multilateral, regional and bilateral levels, as well as with national IPR regulations, is an enormous challenge for any country. In the case of developing countries and least developed countries, it might be impossible.

WIPO has provided a forum for the development of new IPR treaties

Since TRIPS entered into force, WIPO has provided a forum for the development of new IPR treaties. Most notable among these are the 1996 Internet treaties: the WIPO Copyright Treaty (WCT) and the WIPO Performers and Phonograms Treaty (WPPT). In 2000, the Patent Law Treaty (PLT) was also adopted at a Diplomatic Conference. The PLT was intended to harmonize certain patent procedures, but steered clear of matters relating to substantive patent law. However, WIPO has proposed a Substantive Patent Law Treaty (SPLT) that the organization's Standing Committee on the Law of Patents has been debating in 2003.

In terms of patent law, the draft Substantive Patent Law Treaty has the potential to harmonize national and regional patent laws almost completely.³⁴ While the SPLT initiative may never go much further than defining key terms, such as prior art, novelty and inventive step (which alone would considerably limit members' discretion as to the breadth of patent claims), a senior WIPO official has suggested as a future possibility "the establishment of basic principles regulating an ideal global patent system, according to which a patent granted in a civil procedure would have effect in different countries, and it would co-exist with existing national patent systems".³⁵ Obviously, any such system would have to provide agreed standards on the scope of patentable subject matter. And as history shows, what major industrialized countries agree upon, the rest of the world tends to accept.

The WIPO Internet treaties demonstrate the organization's continuing role in the development of new IPR norms, which, among other things, seek to accommodate new technological advances. They are also important in that the major trading partners have suggested that TRIPS be revised to incorporate the treaties, and are actively encouraging other countries to sign and ratify them through, for example, bilateral trade agreements containing such a requirement.³⁶

Away from the Geneva-based intergovernmental agencies, some bilateral and regional-level negotiations have been concluded and others are under way that aim to raise national IPR standards to the level of TRIPS, or even beyond. Some of the resulting agreements have required developing countries to promise they will introduce TRIPS standards before the expiry of the transitional periods, and even to introduce higher standards of protection than required by TRIPS.³⁷ Many such commitments are embedded in free trade agreements.

According to Drahos, there is a good reason why such agreements are becoming common.³⁸ This is because the developing countries are becoming more effective negotiators at the TRIPS Council and have successfully blocked moves to push standards beyond those that the present text of the Agreement requires. Therefore some developed country members may prefer bilateral or regional negotiations where developing country members lack comparable possibilities to build large coalitions.

The international law of plant genetic resources and IPRs

UPOV provides a framework for IPR protection of plant varieties

The global IPRs architecture would not be complete without reference to the UPOV Convention, the Convention on Biological Diversity (CBD) and the Treaty on Plant Genetic Resources of the Food and

Agriculture Organization (FAO). The remainder of this chapter deals with these instruments, and considers some of the potential opportunities and possible challenges posed by them.

The UPOV Convention

UPOV provides a framework for IPR protection of plant varieties. The Convention was signed in Paris in 1961 and entered into force in 1968. It was revised in 1972, 1978 and 1991.³⁹ The Convention established the International Union for the Protection of New

Varieties of Plants, which is based in Geneva and is associated with WIPO. As of 15 January 2003, there were 52 States Parties, of which about half were developing countries or economies in transition. The main reason for this trend is Article 27.3 (b) of TRIPS,

which requires WTO Members to provide protection for plant varieties by patents, a *sui generis* system, or a combination of these. But it is also true that some developing countries have agreed to join UPOV because bilateral free trade agreements with developed country trading partners require them to do so. TRIPS, however, does not refer to UPOV, but the UPOV system is the only *sui generis* system for plant

varieties that exists in international law. Alternative models have been developed, but, with rare exceptions,⁴⁰ these remain to be tested in the real world.⁴¹ It should be pointed out that there are two versions of the UPOV Convention: UPOV 1978 and UPOV 1991. (See box 2.4 for eligibility and scope of protection under UPOV.)

Box 2.4: Eligibility and scope of protection under UPOV

To be eligible for protection, the plant variety must be novel, distinct, stable, and uniform (in UPOV 1991) or homogeneous (in UPOV 1978). To be novel, the variety must not have been offered for sale or marketed, with the agreement of the breeder or his successor in title, in the country where the application for protection has been filed earlier than one year before that date, and (in general) earlier than four years in any other country. To be distinct, the variety must be distinguishable by one or more characteristics from any other variety whose existence is a matter of common knowledge. To be considered stable, the variety must remain true to its description after repeated reproduction or propagation.

UPOV 1978 defines the scope of protection as the breeder's right to authorize the following acts: "the production for purposes of commercial marketing; the offering for sale; and the marketing of the reproductive or vegetative propagating material, as such, of the variety". The Convention establishes minimum standards such that the breeder's prior authorization is required for at least the three acts mentioned above. UPOV 1991 extends the minimum period of protection from 15 years to 20 years. This later version is silent on the matter of double protection (i.e. both patents and plant breeders' rights), whereas the earlier version stated that "member states may not protect varieties by both patent and special rights". Even so, many countries expressly forbid the patenting of plant varieties, including most European countries.

According to both versions of the UPOV Convention, the breeder's right may be subject to two exceptions: the "breeders' exemption" and the "farmers' privilege". These exceptions are analysed below.

The right of breeders both to use protected varieties as an initial source of variation for the creation of new varieties and to market these varieties without authorization from the original breeder (the "breeders' exemption") is upheld in both the 1978 and 1991 versions. One difference is that the 1991 version states that the original breeder's right extends also to varieties, which are *essentially derived* from the protected one. The idea here is that breeders should not be able to acquire protection too easily for minor modifications of extant varieties. This provision is also intended to ensure that patent rights and PBRs operate in a harmonious fashion.

There is no reference in the 1978 version to the right of farmers to re-sow seed harvested from protected

varieties for their own use (often referred to as "farmers' privilege"). Thus countries that are members of the 1978 Convention are free, but not obliged, to uphold the farmers' privilege. In this respect, the 1991 version is more specific. Whereas the scope of the breeder's right includes production or reproduction and conditioning for the purpose of propagation,⁴² governments can use their discretion in deciding whether to uphold the farmers' privilege. Article 15 provides for an optional exception that allows parties "within reasonable limits and subject to the safeguarding of the legitimate interests of the breeder, [to] restrict the breeder's right in relation to any variety in order to permit farmers to use for propagating purposes, on their own holdings, the product of the harvest which they have obtained by planting, on their own holdings, the protected variety or a[n essentially derived] variety". In effect, this means that parties to UPOV 1991 can continue to uphold the farmers' privilege as long their national PBR system provides for it. If the national

PBR legislation of UPOV 1991 parties is silent about farmers' privilege, this presumably means there is

no such privilege and that farmers cannot re-sow harvested seed even on their own farms.

The Convention on Biological Diversity and the Conference of the Parties

The CBD, which entered into force in 1993,⁴³ has as its three objectives "the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources". Intellectual property rights, and particularly patents, are considered to be most relevant to the third of these objectives, that of fair and equitable benefit sharing. The TRIPS Agreement, concluded after the entry into force of the CBD, does not require the establishment of any mechanisms to ensure fair and equitable benefit sharing with States and the holders of traditional knowledge.

The most important parts of the Convention here are Articles 15 and 8(j). Article 15 recognizes the sovereign rights of States over their natural resources, and their authority to determine access to genetic resources, and that access, where granted, shall be on mutually agreed terms and subject to prior informed consent of the provider party. Article 8(j) requires parties to "respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices."

Since there is no reference in the TRIPS Agreement to the CBD requirements of prior informed consent or encouragement of benefit sharing, industrialized countries that provide for the patenting of genetic resources usually grant such patents without examining the origin of the genetic material, the existence of prior informed consent on the part of indigenous communities, or whether the patentee is committed to sharing the commercial benefits with the provider of the genetic material. In addition, IPRs may inhibit, due to their exclusiveness, "appropriate access" to genetic resources, which is one of the CBD's objectives.⁴⁴ Therefore, the question of

how to interpret the relationship between the TRIPS Agreement and the CBD has been the source of considerable controversy in the TRIPS Council.⁴⁵

In the CBD, intellectual property is explicitly referred to only in the context of technology transfer, which is supposed to be one of the main kinds of benefit for provider countries to receive.⁴⁶ Article 16 on access to and transfer of technology requires Parties to the Convention to undertake to provide and/or facilitate access and transfer of technologies to other Parties under fair and most favourable terms. The only technology referred to is biotechnology, but Article 16 is concerned with any technologies "that are relevant to the conservation and sustainable use of biological diversity or make use of genetic resources and do not cause significant damage to the environment". Recognizing that technologies are sometimes subject to patents and other IPRs, access to such technologies must be "on terms which recognize and are consistent with the adequate and effective protection of intellectual property rights".⁴⁷ Clearly this is nothing for the life science industries to feel too concerned about. Indeed, the clause beginning "adequate and effective protection" was specifically added to establish a link with the draft TRIPS Agreement, which also used this language, as did the final version.

Article 16.5 is a little more controversial, requiring the Parties to cooperate to ensure that patents and other IPRs "are supportive of and do not run counter to" the CBD's objectives. This reflects the profound disagreement during the negotiations between those who believed that IPRs conflict with the CBD's objectives and others that saw no contradiction. While the language does not seem particularly threatening, life-science firms in the United States were, nonetheless, unhappy with the CBD's coverage of IPRs, and with the Convention more generally, and persuaded the Government that it was not in the United States' best interests to sign it. Although the United States did so a few years later, it remains one of the few countries in the world not to have ratified it.⁴⁸

The relationship between the TRIPS Agreement and the CBD has been the source of considerable controversy

To review implementation of the CBD, the Conference of the Parties (composed of all Contracting Parties) meets periodically (usually biannually). IPRs are most frequently discussed in deliberations on such topics as access to genetic resources, benefit sharing, and the knowledge innovations and practices of indigenous and local communities, and not so much with regard to transfer of technology.

At the Sixth Meeting of the Conference of the Parties, which took place in The Hague in May 2002, the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization were officially adopted. The Guidelines, which are intended to be used when developing and drafting legislative, administrative or policy measures on access and benefit sharing (ABS) and contracts, have a number of provisions relating

to IPRs. They suggest to Parties with genetic resource users under their jurisdiction to consider adopting “measures to encourage the disclosure of the country of origin of the genetic resources and of the origin of traditional knowledge, innovations and practices of indigenous and local communities in applications for intellectual property rights”.⁴⁹ As a means of implementing the CBD provision that benefit sharing be upon mutually agreed terms, two elements to be considered as guiding parameters in contracts and as basic requirements for mutually agreed terms are that “provision for the use of intellectual property rights include joint research, obligation to implement rights on inventions obtained and to provide licences by common consent”, and “the possibility of joint ownership of intellectual property rights according to the degree of contribution”.^{50 51}

The Food and Agriculture Organization (FAO) and the International Treaty on Plant Genetic Resources for Food and Agriculture

During the 1980s the FAO became the principle battleground of what came to be known as “the seed wars”.⁵² The main bone of contention was that the developed countries were allegedly abusing the free exchange principle. The main criticisms were, first, that most of the world base-crop collections were held in the developed world even though most of the accessions had come from the developing world. Second, while folk varieties were treated as being the common heritage of humankind, plant breeders in the developed countries were securing IPR protection for their own varieties.

In 1983, the FAO Commission on Plant Genetic Resources (CPGR) was created to provide a forum where governments could meet for discussion, and monitor the non-binding agreement known as the International Undertaking on Plant Genetic Resources (the Undertaking), whose objectives were “to ensure the safe conservation and promote the unrestricted availability and sustainable utilization of plant genetic resources for present and future generations, by providing a flexible framework for sharing the benefits and burdens.”

The “Farmers’ Rights” concept was included in the Undertaking from 1989 - in response to the developed countries’ insistence on excluding IPR-protected plant varieties from application of the

common heritage principle.⁵³ In this context, it should be noted that the term “Farmers’ Rights” has to be distinguished from “farmers’ privilege”. The latter is a clearly defined (cf. Art. 15(2) UPOV 1991) exception to the breeders’ exclusive right. “Farmers’ Rights” is not an IPR as such, but it is frequently suggested as a principle that could be implemented as a compensation or benefit-sharing mechanism. Officially “Farmers’ Rights” is an attempt to acknowledge “the contribution farmers have made to the conservation and development of plant genetic resources, which constitute the basis of plant production throughout the world”.⁵⁴

In 1993, the CPGR (Resolution 93/1) called for the Undertaking to be revised in harmony with the CBD. To this end, the Commission, now called the Commission on Genetic Resources for Food and Agriculture (CGRFA), held a series of negotiations to revise the International Undertaking. Protracted discussions progressed, albeit slowly, at several extraordinary sessions of the CGRFA, and at a series of contact group meetings convened by the Chair of the CGRFA. These negotiations were finally concluded in November 2001, when a text for the revised Undertaking was adopted and then converted into a legally binding treaty (see box 7.3 on the FAO International Treaty).⁵⁵

The FAO seeks to promote access and benefit sharing with respect to genetic resources

As to the relationship of the FAO Treaty with the TRIPS Agreement, and in particular Article 27.3(b), there is some potential for conflict. This is due to the fact that the TRIPS Agreement legitimises intellectual property protection and thus the monopolization of genetic resources. By contrast, it is one of the objectives of the FAO Treaty to promote facilitated access to plant genetic resources covered by the Treaty (Article 10.2). The Treaty also recognizes national sovereignty over those resources (Article 10.1). This raises the question whether individuals or companies may claim intellectual property rights that limit the facilitated access to the plant genetic resources covered by the FAO Treaty.⁵⁶

With regard to the CBD, the FAO Treaty has similar objectives. It also seeks to promote access and

benefit sharing with respect to genetic resources.⁵⁷ The main difference between the two agreements is their way of realizing this objective. While the CBD places considerable emphasis on the sovereignty of each State over its own genetic resources and places the responsibility for facilitating access to those resources on each Contracting Party,⁵⁸ thus suggesting *bilateral* arrangements, the FAO Treaty refers to a *multilateral* system for access facilitation and benefit sharing.⁵⁹ This is done in recognition of the fact that even large countries are not entirely self-sufficient in plant genetic resources for food and agriculture,⁶⁰ and that a multilateral system of access and benefit sharing would reduce costs and enlarge the pool of available genetic resources.

* * *

In brief, as stated at the outset, the emerging global architecture for IPRs has become increasingly complex and thus posing an enormous challenge for any country. With respect to developing countries, the Report of the Commission on Intellectual Property Rights (see box 1.2, above) has well summarized the situation in the following terms:

“[...] our conclusions place a responsibility on the international community to assess whether the mechanisms in place for negotiating intellectual property standards, both multilaterally and bilaterally, take sufficient account of the interests of developing countries and poor people. We consider that the institutional framework is not optimally suited to this task and needs to display considerably greater sensitivity to these issues. [...]”

(Commission Report, 155)

The Report then raises the following central questions:

- Do the key international institutions, in particular WTO and WIPO, provide adequate advice and analysis based on an understanding of the particular needs of developing countries, and poor people?
- In their bilateral relations with developing countries, do developed countries take sufficient account of the impact of IPRs on developing countries and in particular the poor people in them?
- Are developing countries themselves sufficiently aware of where their own interests lie, and do they have the capacity to secure those interests in bilateral and multilateral negotiations?⁶¹

The global architecture for IPRs has become increasingly complex

* * *

The discussion of the global IPR architecture leads us to consider some of the cross-cutting issues that policy makers need to consider in designing and adopting IPR policies. This is the subject of Part Two of this report.

CHAPTER 2: END NOTES

- ¹ See Vivas, D, “Inventory of relevant international negotiations, activities and processes on intellectual property”. UNCTAD-ICTSD Capacity Building Project on IPRs and Sustainable Development, 2002, at <http://www.ictsd.org/iprsonline/unctadictsd/docs/Vivas2002.pdf>.
- ² Examples of these kinds of agreements include the 1973 European Patent Convention, the 1998 European Community Directive on the Legal Protection of Biotechnological Inventions, the 1982 Harare Protocol on Patent and Industrial Designs within the Framework of the African Regional Industrial Property Organization, and the 2000 Andean Community Common Regime on Industrial Property. Some of these, such as Chapter 17 of the North American Free Trade Agreement (NAFTA), are components of trade agreements rather than stand-alone IPR treaties.
- ³ Specifically, these include those bilateral agreements that deal with IPRs as perhaps one of several issues covered. Recent examples are the Free Trade Agreements between the United States and respectively Jordan (2002), Singapore (2003) and Chile (2003).
- ⁴ Article 3, of the Convention Establishing the World Intellectual Property Organization. Signed at Stockholm on July 14, 1967.
- ⁵ For example, some of the language of the European Patent Convention and of Chapter 17 of the North American Free Trade Agreement were incorporated into the TRIPS Agreement. Having made this point, the national laws of some influential countries may also be used as sources of text to be incorporated into multilateral agreements, although such countries are likely to be few in number (and perhaps only the United States).
- ⁶ TRIPS Article 4.1 provides that “With regard to the protection of intellectual property, any advantage, favour, privilege or immunity granted by a Member to the nationals of any other country shall be accorded immediately and unconditionally to the nationals of all other Members.” For more details on the MFN obligation, see below, and, in particular, the UNCTAD/ICTSD “Resource Book on TRIPS and Development”, Part One, Section 1.3 (<http://www.ictsd.org/iprsonline/unctadictsd/ResourceBookIndex.htm>).
- ⁷ See Vivas, D, “Regional and bilateral agreements and a TRIPS-plus world: the Free Trade Area of the Americas (FTAA)”, *TRIPS Issues Papers* no.1, published by the Quaker United Nations Office (QUONO), Geneva, the Quaker International Affairs Programme (QIAP), Ottawa, and the International Centre for Trade and Sustainable Development (ICTSD), Geneva, 2003. Available at: http://www.geneva.quono.info/main/showproject.php?p_id=41&pg_id=113.
- ⁸ The Punta del Este Declaration provisions on IPRs (D. Subjects for Negotiations) states: “In order to reduce the distortions and impediments to international trade, and taking into account the need to promote effective and adequate protection of intellectual property rights, and to ensure that measures and procedures to enforce intellectual property rights do not themselves become barriers to legitimate trade, the negotiations shall aim to clarify GATT provisions and elaborate as appropriate new rules and disciplines.

Negotiations shall aim to develop a multilateral framework of principles, rules and disciplines dealing with international trade in counterfeit goods, taking into account work already underway in GATT.

These negotiations shall be without prejudice to other complementary initiatives that may be taken in the World Intellectual Property Organization and elsewhere to deal with these matters.”
- ⁹ See Roffe, P, “The political economy of intellectual property rights - an historical perspective”, in J. Faundez, J, Footer, ME and Norton, JJ (eds), *Governance, Development and Globalization: A Tribute to Lawrence Tshuma*, London, Blackstone Press, 2000: 404-405.
- ¹⁰ Doremus, PN, “The externalization of domestic regulation: intellectual property rights reform in a global era”, *Global Legal Studies Journal* 3 (2), 1996 (<http://www.law.indiana.edu/glsj/vol3/no2/doremus.html>).
- ¹¹ Ryan op cit; Sell, SK, “Power and Ideas: North-South Politics of Intellectual Property and Antitrust”, Suny Series in Global Politics, Albany: State University of New York Press, 1998.

- ¹² See, for example, Inman BR and Burton, DF Jr., “Technology and Competitiveness: ‘The new policy frontier’”, *Foreign Affairs* 69 1990: 117-134. See also Drahos, P, “Information Feudalism. Who Owns the Knowledge Economy”, Earthscan, London, 2002.
- ¹³ Such as by incorporating, by reference, new WIPO treaties. For example, the United States and the EU have been suggesting that TRIPS be revised to incorporate the 1996 WIPO Performances and Phonograms Treaty and the WIPO Copyright Treaty (Correa, “Intellectual Property Rights, the WTO and Developing Countries: The TRIPS Agreement and Policy Options”, London, New York and Penang: Zed Books and Third World Network, 2000: 232).
- ¹⁴ See Drahos, P, “BITs and BIPs: bilateralism in intellectual property”, *Journal of World Intellectual Property* 4 (6), 2001: 791-808.
- ¹⁵ In fact, it was agreed to delete the reference to counterfeit goods from the title of the agreement.
- ¹⁶ This can be consulted at: <http://www.ictsd.org/iprsonline/unctadictsd/ResourceBookIndex.htm> .
- ¹⁷ See Reichman, JH, “From free riders to fair followers: global competition under the TRIPS Agreement”, *New York Journal of International Law and Politics* 29, 1996-97: 11-93.
- ¹⁸ TRIPS footnote 14.
- ¹⁹ Kim, L and Nelson, RR, “Introduction”, in Kim L and Nelson RR (eds.), *Technology, Learning, and Innovation: Experiences of Newly Industrializing Economies*, Cambridge: Cambridge University Press, 2000.
- ²⁰ Kim and Nelson op cit., citing Schnaar, S, “Managing Imitation Strategy: How Later Entrants Seize Markets from Pioneers”, New York: Free Press, 1994.
- ²¹ Evans, GE, “The principal of national treatment and the international protection of industrial property”, *European Intellectual Property Review* 18 (3), 1996: 149-160.
- ²² Likewise, the EU's Council Regulation (EEC) No. 2081/92 of 14 July 1992, on the Protection of Geographical Indications of Origin for Agricultural Products and Foodstuffs, in its Article 12(1), appears to have recourse to a material reciprocity requirement as far as the protection in the EU of third-country agricultural products or foodstuffs is concerned. This has sparked criticism and the threat of recourse to WTO dispute settlement from the United States and Australia. For details, see the *Resource Book on TRIPS and Development*, Part Two, section 2.3, sub-section 6.3.
- ²³ See Article 3(3) of UPOV 1978, enabling member States of the Union to deviate from the national treatment principle. By contrast, Article 4 of UPOV 1991 does not provide for such an exception to the national treatment principle.
- ²⁴ Article 41.1.
- ²⁵ Article 41.2.
- ²⁶ Article 45.1.
- ²⁷ Article 61.
- ²⁸ Article 41.5.
- ²⁹ In a recent report, Médecins Sans Frontières (MSF) illustrate how thorough patent examinations and strict criteria of patentability may assist a developing country in the pursuit of effective public health policies. See MSF, “Drug Patents Under the Spotlight: Sharing Practical Knowledge About Pharmaceutical Patents”, Geneva: MSF, May 2003: chapter 3. A summary of the report is available at: <http://www.msf.org/content/page.cfm?articleid=697723AF-C81B-467C-94053B91C769DF41>.
- ³⁰ See WTO documents WT/MIN(01)/DEC/1, WT/MIN(01)/DEC/2, and WT/MIN(01)/17 of 20 November 2001.
- ³¹ Pursuant to this, in February 2003, the Council for TRIPS adopted a decision requiring the developed country WTO members to “submit annually reports on actions taken or planned in pursuance of their commitments under Article 66.2.” Such reports must provide the following information: (a) an overview of the incentives regime put in place to fulfill the obligations of Article 66.2, including any specific legislative, policy and regulatory framework; (b) identification of the type of incentive and the government agency or other entity making it available; (c) eligible

enterprises and other institutions in the territory of the Member providing the incentives; and (d) any information available on the functioning in practice of these incentives (See WTO document IP/C/28).

³² See Drahos, P, *op.cit.*, 2002

³³ See MSF, CPT, Oxfam International and HAI, "Implementation of the Doha Declaration on the TRIPS Agreement and Public Health: Technical Assistance - How to Get it Right", Report of a one-day conference in Geneva, 28 March, 2002; and the Report of the Commission on Intellectual Property Rights, Chapter 8: 155 *et seq.*, *op.cit.*, both of which raise this issue.

³⁴ See The South Centre, "The WIPO patent agenda: the risks for developing countries", *T.R.A.D.E Working Paper* no. 12, 2002, available at <http://www.southcentre.org/publications/wipopatent/wipopatent.pdf>.

³⁵ Uemura, S, "WIPO update: patent law harmonization and the grace period", *CASRIP Publication Series: Rethinking Intellectual Property* 6, 2000: 263-270.

³⁶ See Correa, CM, "Reviewing the TRIPS Agreement, in United Nations Conference on Trade and Development, 'Elements of a positive agenda'", in UNCTAD, *Positive Trade Agenda for Developing Countries: Issues for Future Trade Negotiations*, Geneva: UNCTAD, 2000.

³⁷ A good example of such a bilateral agreement is the 2000 Agreement Between the United States of America and the Hashemite Kingdom of Jordan on the Establishment of a Free Trade Area, which requires patents to be available for any invention in all fields of technology, without including the exception from Article 27.3(b) of TRIPS. Jordan must also join UPOV. In addition, a supplementary memorandum of understanding requires Jordan to allow the patenting of business methods and computer-related inventions.

³⁸ Drahos, P, "Developing countries and international intellectual property standard-setting", London: Commission on Intellectual Property Rights, 2002: 29.

³⁹ Note that for non-UPOV countries, accession to the 1978 Act is no longer possible (since 31 December 1995 for developing countries, see Article 37(3) of UPOV 1991).

⁴⁰ The only two appear to be the United States Plant Patent Act, passed in 1930, which protects asexually reproduced varieties, and a similar legislation in the Republic of Korea (WTO-CTE (1999)). See "The relationship between the Convention on Biological Diversity (CBD) and the Agreement on Trade-related Aspects of Intellectual Property Rights (TRIPS), with a focus on Article 27.3 (b)". Background note by the Secretariat [WT/CTE/W/125]).

⁴¹ Such models include the Organization of African Unity's "African model legislation for the protection of the rights of local communities, farmers and breeders, and for the regulation of access to biological resources" and the "Convention of Farmers and Breeders", which was produced by an Indian advocacy group called Gene Campaign. Both were drafted in the late 1990s. Also, the Crucible Group produced a set of options for *sui generis* intellectual property laws for plant varieties (see Crucible II Group, "Seeding Solutions, Volume 2: Options for National Laws Governing Control over Genetic Resources and Biological Innovations", Ottawa, Rome and Uppsala: IDRC, IPGRI and Dag Hammarskjöld Foundation, 2001). India's recently passed legislation on plant breeders' rights is unusual in that it diverges from the UPOV standards and may provide a suitable model for other developing countries.

⁴² Article 14.

⁴³ As of 13 December 2002, the CBD had 186 State parties plus the European Community.

⁴⁴ See Article 1 of the CBD.

⁴⁵ For an overview of the positions expressed by some developing country delegations at the TRIPS Council, see the "Resource Book on TRIPS and Development", Part Two, section 2.5.5 on Article 27.3(b).

⁴⁶ Along with appropriate access to genetic resources and appropriate funding (Article 1).

⁴⁷ Article 16.2.

⁴⁸ Thailand is another notable non-Party.

⁴⁹ Paragraph 16(d)(ii).

⁵⁰ Paragraph 42(c) and (d).

- ⁵¹ COP Decision VI/24, to which the Bonn Guidelines were annexed, also called for further information gathering and analysis on several matters including: a) impact of intellectual property regimes on access to and use of genetic resources and scientific research; b) role of customary laws and practices in relation to the protection of genetic resources and traditional knowledge, innovations and practices, and their relationship with intellectual property rights; c) efficacy of country of origin and prior informed consent disclosures in assisting the examination of intellectual property rights application and the re-examination of intellectual property rights granted; d) feasibility of an internationally recognized certification of origin system as evidence of prior informed consent and mutually agreed terms; and e) role of oral evidence of prior art in the examination, granting and maintenance of intellectual property rights.
- ⁵² See Kloppenburg J Jr., and Kleinman DL, “Seed wars: common heritage, private property, and political strategy”, *Socialist Review* 95, 1987: 6-41.
- ⁵³ Halewood, M, “Indigenous and local knowledge in international law: a preface to sui generis intellectual property protection”, *McGill Law Journal* 44, 1999: 953-996.
- ⁵⁴ CPGR Resolution 5/89 defined farmers’ rights as “rights arising from the past, present and future contributions of farmers in conserving, improving and making available plant genetic resources particularly those in the centres of origin/diversity. Those rights are vested in the international community, as trustees for present and future generations of farmers, and supporting the continuation of their contributions as well as the attainment of overall purposes of the International Undertaking” [on Plant Genetic Resources].
- ⁵⁵ According to its Article 28, the Treaty will enter into force 90 days after the deposit of the fortieth instrument of ratification, acceptance, approval or accession. For the current membership see <http://www.fao.org/Legal/TREATIES/033s-e.htm>.
- ⁵⁶ For a legal analysis of this issue see the “Resource Book on TRIPS and Development”, Part Two, section 2.5.5 on Article 27.3(b) TRIPS.
- ⁵⁷ While the CBD refers to genetic resources in general, the FAO Treaty is limited to “plant genetic resources for food and agriculture” (see Article 1.1).
- ⁵⁸ See Article 15 of the CBD.
- ⁵⁹ See Article 10.2 of the FAO Treaty.
- ⁶⁰ See the Preamble.
- ⁶¹ See Report of the Commission, op.cit.: 156.

II

CROSS-CUTTING ISSUES: THE OPPORTUNITIES

Having examined in Part One the main aspects of the global architecture of IPRs, Part Two focuses on some broad cross-cutting issues that could be seen as opportunities for developing countries in the design of intellectual property regimes which are responsive to their local conditions. The following chapters discuss issues such as innovation and creativity, access to new technologies and transfer of technology.

3

Fostering Invention, Innovation and Creativity in Developing Countries

Fostering invention, innovation and creativity in general should be central objectives of intellectual property policies. This chapter starts by reviewing how these activities generally take place. It then considers some IPR disciplines and their relevance to local conditions prevailing in developing countries. It concludes with some broad considerations regarding sectors of special significance to those countries.

Introduction

There is considerable innovative and creative activity in developing countries in areas such as textile design, plant cultivation, medicine, software and music. The key issue is how to translate this creativity and innovation into a process that takes ideas and expressions and transforms them into an end product. In this respect, innovation is heavily dependent on IPRs. As we saw earlier, two essential justifications for IPRs are that they are supposed to provide incentives for investing in R&D and creative activities, and in extending markets for technology and products. At the same time, the exclusionary aspects of strong IPRs can increase costs of follow-on innovation and imitation. Therefore a balanced approach is required, with particular features of the system varying according to the level of economic development. In discussing invention, innovation and creativity, the following considerations deserve attention.

First, invention and innovation are not interchangeable words. Invention is the first step in the development of a marketable new product or process. Innovation comes afterwards. Joseph Schumpeter's well-known definition of innovation (or what he calls "carrying out new combinations") comprises: "(1) The introduction of a new good. (2) The introduction of a new method of production, which need by no means be founded upon a discovery scientifically new. (3) The opening of a new market. (4) The conquest of a new source of supply of raw materials. (5) The carrying out of the new organization of any industry."¹ In sum, innovation is the process that

transforms ideas (i.e. inventions) into commercially viable products. Patents, by requiring an "inventive step", protect the creative activity as such, irrespective of the product's actual marketing potential. Innovation connotes newness but it is possible to argue that an innovation for one company or national economy may not necessarily be innovative for another.²

Second, invention is incremental and cumulative in nature. Large breakthroughs in knowledge are rare. But developing new versions of existing products and technologies is common everywhere, including in developing countries. This fact is key to dynamic competition.

Third, innovation is typically associated with developing new ways of doing things that are appropriate or useful for local economic and social environments. Innovators in developing countries may be expected to develop new products (e.g. machines, tools, software or consumer goods) that meet local needs and export niches. Again, this "niche" effect of innovation is important for technology followers.

Fourth, learning how to do things from observing others and from adopting technologies from abroad is another form of technical change. Thus, international investment and trade that generate transfer of technology and skills have important spillover effects. International firms bring new management techniques that may be learned and adapted, while imports of capital goods and equipment stimulate

There is considerable innovative and creative activity in developing countries

local technological learning through backward linkages and assimilation and adaptation.

Fifth, creativity is the act of manifesting original expressions through tangible or intangible works including music, software, literary works, artistic works and performances. Many of the intangible expressions can be fixed in a tangible format (i.e. paper, video and audio). Originality can be found in all individuals or societies independently of the level of education, cultural background or development. It can be generated either individually or collectively.

Sixth, invention, innovation and creativity do not operate in a vacuum. They take place in an appropriate environment which includes relevant policies and institutions and, above all, human resources. This report does not deal with this broad development question, but rather with the relationship between IPRs and development. In this context, intellectual property policies should not be seen in isolation from development policies and, particularly in the case of inventions and innovations, from the national innovation system of each country. The general goal of national innovation systems is to enhance a country's stock of technical knowledge and know-how, which occurs both through acquisition and learning of foreign technology and the development of institutions and technical capabilities at home.³ In effect, therefore, each country has

a national innovation system, comprising suppliers, customers, R&D institutions, universities, technological institutes and bridging institutions, such as sectoral technology and innovation centres, industry associations, institutions involved in education and training, and financial institutions geared to financing new initiatives. A key property of the system is not so much its component parts as how they perform and interact as a dynamic whole. However, the level of development, sophistication and effectiveness of the national system of innovation differs among countries.

Whereas many innovative and creative activities have developed against a background of weak enforcement of IPRs, the new global regime requires all nations to protect both domestic and foreign technologies and works from unauthorized use. In this regard, what features of IPRs may be used effectively for fostering creativity and innovation?

The remainder of this chapter looks into some of the features of intellectual property rights and means of designing them to become more responsive to local conditions. It also deals with sectors (e.g. software, textiles and music) of particular relevance to developing countries.

IPRs and local conditions

Patents and utility models

Patents provide inventors with rights to exclude others from making, using, offering for sale, selling or importing their inventions for a fixed period of time subject to certain limitations (box 2.1, above). It is in the specification of these limitations that the competitive or exclusionary features of patents are found. For countries with a weak technological base, the following standards seem appropriate for *invention patents*: (i) wide exceptions, including broad research exceptions; (ii) high standards of non-obviousness and inventive steps; (iii) narrow claims; (iv) narrow "doctrine of equivalents";⁴ and (v) transparent and accessible opportunities for opposing patents.

However, there are other second-tier patent systems, such as utility models, which are worthwhile examining, especially for countries where the technological base is still at an early stage of development.

Many countries have adopted a second-tier patent regime, though there is no uniformity as to the nature of the rights granted under it, and the TRIPS Agreement is silent on this type of IPR. It has been referred to variously as a "utility model" (e.g. in China, Germany, Japan and the Republic of Korea), or an "innovation patent" (in Australia), a "utility innovation" (in Malaysia), or a "short-term patent" (in Belgium and Ireland) (see box 1.1 above).

Second-tier patent systems are worthwhile examining

The system normally coexists with major patent regimes. Usually rights are accorded to inventions which show local or regional novelty. Although some countries do insist that the invention have an inventive step, this is usually of a low standard. Indeed, a popular feature of many second-tier regimes is that registration is usually granted upon examination of formalities only, without any accompanying search for novelty or an inventive step. The duration of protection varies among countries, and ranges from 6 to 20 years.

There is persuasive evidence that cheap and rapid second-tier patent protection can improve the environment for effective marketing of incremental innovations by local firms. This is especially so if the protection regime is targeted at local industrial or product sectors that are concerned not so much with major inventions as with incremental or improvement innovation. For example, one reason for the draft EC Directive on utility model protection is the need for a rapid and cheap protective regime for innovations that arise in the following important EU industries: toy manufacturing, clock and watch making, optics, microtechnology and micromechanics.⁵ Similarly, Australia introduced in 1979 the "petty patent" system in order to encourage local innovation in small businesses. This, in turn, was due to the nature of the Australian economic structure: it is a net importer of technology, and much innovation is based on improvements rather than on major breakthroughs of technology.

Another major policy consideration for introducing second-tier patent protection is that many of these kinds of innovations emanate from small and medium-sized enterprises, as opposed to larger multinational conglomerates. A developing country should determine whether the current patent regime is attuned to the needs of its businesses and the types of inventions or innovations they produce. The creative activity which originates from small local firms typically is of an incremental nature, and is a prime candidate for free-riding activities by competitors. Furthermore, cost is an essential factor for such firms in deciding whether to use the patent system or not. The second-tier patent regime tends to be cheaper, with a higher rate of processing applications due to the fact that there is no substantive examination. The downside of this type of protection is that, due to the lack of examination, it

does encourage unrealistically broad claims which can only be verified by reference to an examining or judicial authority.

However, much depends on the technological sophistication of a country. A prime example is Japan, which was the first Asian country to introduce utility model protection. There has been a steady drop in applications for registrations: from approximately 191,000 in 1980 to 77,000 in 1993 and 10,000 in 1999. There are various reasons for this. First, the Japanese Government revised the utility model law and introduced a "no examination" rule, while curtailing the duration of protection from 10 to 6 years. One commentator states that these revisions to the law have meant difficulty in obtaining judicial or administrative relief and a loss of confidence as to the validity of non-examined rights.⁶ Secondly, since the total number of patents granted increased during this same period,⁷ another explanation is that there has been a shift in the Japanese innovation culture. Japanese industries tended to focus on incremental innovation rather than radical innovation during the period from the post-war years to the 1980s and this trend has since been reversed. This in turn has meant that the utility model system is no longer seen to be as vital as it had once been.⁸

Another important policy factor is the registration climate of the country. For example, statistics show that local firms in Germany, Japan and the Republic of Korea are relatively heavy users of the utility model system, whereas the figures for Australia and many European countries are startlingly low. The reason could be that German, Japanese and South Korean local industries are extremely knowledgeable about the system and utilize it to its fullest extent. Moreover, culturally and economically, registration-based rights are valued more. Thus, introducing a second-tier patent regime for local innovation will be of no avail if there is no national resource to create the user base (which includes not only inventors, but also patent attorneys).⁹

With respect to the use of "utility models" in the context of developing countries, the Report of the Commission on Intellectual Property Rights (see box 1.1, above) concluded: "Rather than diluting the patentability standards to capture the incremental type of innovations that predominate in many developing countries, lawmakers and policy makers in

Second-tier patent protection can improve the environment for effective marketing of incremental innovations

these countries should consider the establishment of utility model protection for stimulating and rewarding such innovations. Further research would seem desirable to assess the precise role that utility model

Industrial design protection

Another type of patent-related policy that can be pro-competitive is industrial design protection (see box 1.1) which offers a minimum of 10 years' protection and protects designs which are either new or original.¹⁰ Most industrial design laws are registration-based (though the United Kingdom and Hong Kong (China) have unregistered design laws as well). However, there are many obstacles which local designers and artists face with a registration-based system. First, the registration formalities can be complex and difficult to comply with, especially in respect of details, such as the dimensions of drawings or types of photographs.¹¹ Second, many design products require market testing in order to decide which specific design collection deserves registration; this behaviour is not assisted by the criterion of novelty and the corresponding lack of a grace period.

One important policy argument against the introduction of a registration-based industrial design system is the decline in the rate of international registration, thus proving its unpopularity with industry. This

Trade secrets

Another form of technology protection is trade secrecy. Trade secrets are protected from disclosure by dishonest means, but once learned through reverse engineering, they enter the public domain. Trade secrets are important for protecting unauthorized exploitation of inventions that are not patentable or for which the costs of patenting may be too high.

Historically, the protection of trade secrets raised fears that lone inventors might create absolute and long-lasting barriers to entry through non-disclosure of their discoveries. The patent system counters this threat by encouraging full disclosure of technological breakthroughs in exchange for fixed-term exclusive rights. Some approaches towards trade-secret law remain largely coloured by this nineteenth-century

protection, or other systems with similar objectives, might play in developing countries." (Commission Report: 121)

is particularly true for the developed countries.^{12 13}

Some countries may first wish to take advantage of the flexibility within the TRIPS Agreement and opt for the lower criterion of protection such as "originality", which requires that a design be creative rather than new. Secondly, is it necessary to adopt a registration-based system? Since 1988, the United Kingdom has provided a third layer of protection for designs with the "unregistered design right". In December 2001, the EU followed suit when the Council of the EU adopted Regulation (EC) No 6/2002 on Community Designs, which provides a short-term unregistered design to go with the longer term registered design already in existence. This regime resolves many of the difficulties discussed above by offering designers and innovators a copyright-type of protection.¹⁴ Moreover, the United Kingdom's approach is available to both aesthetic and functional designs that are not commonplace in the product market in question, thus acting as a bridge between patents, utility models, copyright and unfair competition protection.

tradition, which rests on the legendary solitary inventor.

In modern economies based on constant technological innovation, however, the lone inventor has given way to team research conducted along scientific lines, often in universities or research institutions. The ability of any single firm to prevent others from duplicating undisclosed research results after an initial breakthrough has greatly diminished, while pressures within university communities favour publication of basic research in the interests of science. As regards applications of basic research to industry in this environment, the protection afforded by the patent system offsets some of its monopolistic effects by driving all routine innovation into free competition on the general products

Local designers and artists face obstacles with a registration-based system

market. Trade-secret laws then regulate the pace of competition by protecting innovators against commercial bribery and industrial espionage, while endowing second-comers with an absolute right to reverse engineer or to independently discover non-protected innovations.¹⁵

A pro-competitive trade secrets law could play a catalytic role in promoting local innovation. Components of such a pro-competitive regime would

be: (i) eliminating obvious forms of industrial espionage; (ii) permitting short and reasonable restraints on the use of technical secrets by professional employees who leave employment; and (iii) permitting reverse engineering, as widely defined, including in software. In brief, such a pro-competitive regime should, in harmony with other forms of protection (e.g. patents, copyrights), promote innovation while safeguarding the public domain.

Trademarks

Trademark protection could be particularly valuable in developing countries because of the potential to develop brand recognition for high-quality crafts, clothing, and music. In this respect, it should be seen as a supportive instrument that would facilitate the commercialisation of goods and services. The protection of trademarks (see box 1.1, above) benefits producers, traders and consumers in developed and developing countries alike. The economic justification for trademarks and related protective devices is straightforward. Firms invest resources in their reputation for quality by building in reliable features and guaranteed services. As an easy way of communicating to consumers the quality of their products, a trademark is basically a guarantee of a particular set of quality-related attributes. If it were not protected by the right to exclude others from

using the trademark, and by the right to license its use, other firms would quickly expropriate the trademark's value by selling cheaper items under the mark. The original firm would then suffer a lower return on its investments. In turn, there would be little investment in quality differentiation.

An effective deployment and enforcement of trademarks and related marks can help promote product and firm development. While trademarks provide distinctiveness within the marketplace that permit firms to differentiate their products along quality dimensions, and help raise value added, collective marks and certification marks (see box 1.1, above) may be helpful in ensuring quality and economizing on the costs of advertising and branding.

Trademark protection could be valuable to develop brand recognition

Some sectors of relevance to developing countries

Software

Copyright laws are increasingly being utilized as the optimal means of protecting not only computer programs but also original databases (see also chapter 9). For countries that wish to expand the average size and value added of local software development, copyright protection may prove to be especially important. The scope for software development is particularly great in developing countries because of the specific applications that may be made in response to different countries' business environments, languages and technical regulations. There are hundreds or thousands of such firms in such countries as China, Egypt, Indonesia and Lebanon. For example, Indonesia has successfully

received sub-contracting from the famous Indian software industry. Local industry benefits by securing protection and enforcement, as in the case of a major South Korean software publisher, Hangul and Computer. The firm managed to overcome the threat of bankruptcy by undertaking a concerted nationwide effort to end piracy of its products and to legalize pirated versions which had already been installed.¹⁶

But, much will depend on the nature of the software work that is being done in developing countries. For instance, one study indicates that although there are alliances between international software companies

The scope for software development is great in developing countries

and suppliers in India, the Indian software subsidiaries tend to focus on software maintenance rather than on software design and development of new products.¹⁷ Even where the developing country apparently has a thriving software industry, local software products account for less than 25 per cent of local supplier business. In instances where the foreign firm is not ready to share its technology with its local partner, it may appear to be more beneficial, especially for developing countries that are net importers of technology, to foster new industries so as to expand their technology base. This was the route adopted by what are now Taiwan Province of China, Hong Kong (China), and Macao (China), as well as Singapore and Malaysia, not only for software but also for hardware manufacturing.

One underlying problem in this area is the extent to which protection should be accorded. As explained in chapter 1, the basic economic goal of copyright law is to balance an author's incentive to create with the ability to build on prior innovative work in order to maximize social wealth. To give a concrete example, software is expensive to create and companies need protection in order to recoup their investment; on the other hand, companies can save

The copyright approach and the unregistered design rights approach are attractive to short-lived products

Textiles

Developing countries that possess a considerable textile and garment industry may also consider the flexibility offered by the TRIPS provisions by adopting copyright law, rather than registered design law (see above), as a means to protect designs of such goods. The copyright approach and the unregistered design rights approach are attractive to short-lived products, which include not only fashion and textile industries, but also the toy and digital images industries that are fast moving, quickly imitated and

Music

As in the case of software, the scope for music development is great. There is an abundance of creative musical talent in most developing countries, but relatively few are able to record their compositions and make money from them. The export of recorded music has increased rapidly.²⁰ According to Andersen, Kozul-Wright Z. and Kozul-Wright R.

costs by reusing pre-existing works or certain elements of those works. Often, it is the very same firms that want to protect their software which also want to build on pre-existing works. Thus, an efficient usage of copyright law demands that the courts preserve the balance between innovation today and innovation tomorrow. Although this is true of all innovation and creation, it is especially crucial in the area of software production.¹⁸

While some countries with successful computer technology industries may decide to ban copying outright, copyright law (and for that matter, patent law) should not necessarily deter follow-on competitors from writing independent programs that do not copy an existing program but try to emulate the existing software product so that the "look and feel" (or user interface) of the two software products are essentially the same to the user. There is also the added argument that some elements of the protected pre-existing software are necessary for reuse for the sake of compatibility. Indeed, reusing elements of protected software may be the only way for new competitors to enter and survive within a competitive market.¹⁹

in need of immediate and automatic protection. Copyright, with its lower threshold of originality, is advantageous for countries with industries that customarily rely on the prior state of art and which represent incremental, rather than massive, design improvements. Moreover, design law has historically been proven to be cumbersome and expensive, especially in respect of its high thresholds of protection and complex registration procedures.

"imports from the developing countries in the developed market economies have risen fivefold".²¹

The musical industry has reached a certain level of maturity in the developing world. One interesting example is Latin American and Caribbean music, which has a market not only in Latin America, but also in the United States, where there is a large

The scope for music development is great

population of 25 million Spanish-speakers, as well as in Europe. In fact, according to the Recording Industry Association of America, the Latin music industry claimed a 4.9 per cent share of the United States music industry.²² The Latin music industry is cultural more than territorial, as producers of this music are located in many parts of the hemisphere, particularly Argentina, Brazil, Colombia, Cuba, the Dominican Republic, Mexico, Spain, Venezuela, and the United States. In the United States, Miami is emerging as the capital of Latin music, offering access to capital, appropriate studios, advanced technology and strong copyright laws in favour of producers. The Latin American music industry has strong potential to increase its exports and consolidate its position in foreign markets. However, there are no clear public policies in support of authors, composers and regional producers. The design and implementation of technological restructuring processes, marketing strategies and distribution channels, together with appropriate joint ventures and producers' partnerships, will be important steps to creating a world-wide competitive industry.

Arab music is produced in several countries of Africa and Asia. The production goes mainly to the regional market, but is gaining ground in Europe, especially in France. Currently, there are several Arab music sites on the Internet with increasingly more to offer and growing consumer acceptance in the West. Each Arab country produces and sells its own music and there is no place in the region that could be identified as a centre of such activity.

On the African continent, South Africa is building a small music industry that has connections with the

international sales circuits. South African music has a variety of genres based on its cultural diversity and rich heritage. The South African music industry's sales of recordings represent 0.4 per cent of world sales, which is significant for a single country, and those sales grew at a rate of 70 per cent in 1996. According to the Government of South Africa, the growth is due to new legislation that includes local content requirements and deregulation of the radio industry, as well as a growing synergy between local and international musicians.²³ In addition, World Bank programmes supporting music production have played an important role in South Africa and the African continent.²⁴

There are a number of impediments in this sector that need to be addressed. First, while a weak copyright system may benefit some nations by reducing the rate of imported intellectual property goods in certain areas such as software and educational products (see chapter 9), such a policy may also undermine the very industries which a developing country may wish to nurture. It has been reported that the local music industries in Mali and South Africa have complained that they suffer heavy losses and damages from piracy and copyright violations.²⁵ Secondly, even where copyright legislation is in place, collection and distribution of royalties among the key parties (i.e. composers, performers, publishers and the recording companies) is difficult without an efficient, transparent and fully accountable collective management structure. (See also chapter 9 on collective management.)

There are a number of impediments in the music sector that need to be addressed

CHAPTER 3: END NOTES

- ¹ Schumpeter, JA, "The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle", New Brunswick: Transaction Publishers, [1934], 1983: 66.
- ² UNCTAD, "Investment and Innovation Policy Review: Ethiopia", Geneva, United Nations Publication GE.02-500021, January 2002: 4.
- ³ See UNCTAD, "The TRIPS Agreement and Developing Countries", 1996: 21-22.
- ⁴ The doctrine, which has been adopted in a number of legal jurisdictions (such as the United States and Germany), is intended to ensure that the inventor is able to secure a fair remuneration for unforeseen embodiments that would be obvious to somebody skilled. In essence, it extends the scope of a patent beyond the actual language of the claims to prevent others from reading the patent and inventing around it without doing anything that would not be obvious to a trained technician.
- ⁵ EC Green Paper on the Protection of Utility Models in the Single Market, COM(95) 370 final, Brussels, July 19, 1995:16.
- ⁶ See Heath, C, "Utility Model Law", in Encyclopaedia of Japanese Law from 1868, the Netherlands: Brill Publishing, 2002.
- ⁷ Japan Patent Office, "Patent Filing in Japan", Annual Report 2000.
- ⁸ Mansfield, E, "Intellectual Property Protection, Direct Investment and Technology Transfer: Germany, Japan and the United States", Discussion Paper no. 27 Washington, DC: World Bank 1999. Heath, C, 2002, op cit.
- ⁹ See Evenson, RE and Westphal, LE, "Technological change and technology strategy". UNU/INTECH Working Paper No. 12, UNU/INTECH, Maastricht, 1994; Maskus, KE and McDaniel, C, "Impacts of the Japanese patent system on productivity growth. Center for Economic Analysis, University of Colorado at Boulder Working Paper No. 99-01, 1998; Suthersanen, U, "The economic efficacy of utility model protection: a comparative review of EU, US and Asian policy and practice", in Heath, C and Sanders AK (eds.), *Industrial Property Rights in the Biotech Age - Challenges for Asia*, the Hague, London and Bern: Kluwer Law International, 2003.
- ¹⁰ Industrial designs protect the aesthetic aspects (shape, texture, pattern and colour) of an object, rather the technical features.
- ¹¹ Australian Law Reform Commission, Discussion Paper 58 (Designs), 1994: 330.
- ¹² See the study prepared by Phillips, in which he shows that despite patent registrations being more expensive, with the shortest duration of protection and the longest grant period, the figures for patent registrations were far higher on an international scale than for design registrations, Phillips, J, "International design protection: who needs it?" *European Intellectual Property Review* 12, 1993: 431-436.
- ¹³ For example, in the United Kingdom, serious consideration was given to the abolition of the entire registered design system due to its declining use: the average in the 1950s was 10,000 registrations per annum which dropped to less than 5,000 per annum in the mid-1970s. For the period 1980-1992, national statistics indicate the following changes in granted design registrations: Benelux (3,176 to 2,964); Denmark (193 to 1,257); Finland (721 to 862); France (14,769 to 28,481); Germany (75,545 (only Federal Republic) to 53,334 (united Germany)); Italy (1,025 to 1,083); Portugal (563 to 1,771); Spain (2,646 to 3,154); Sweden (2,146 to 1,961); United Kingdom (4,965 to 8,175). Considering the proliferation of product designs in any particular product market, the registration figures show a surprisingly small increase over 12 years (WIPO Industrial Property Statistics, WIPO: Geneva, 1982-1992).
- ¹⁴ The copyright approach is of particular relevance to the textiles and clothing industries, see the law. For a detailed analysis of registered and unregistered design rights and their relationship with copyright, see the Resource Book, Part 2.4 on industrial designs.
- ¹⁵ See, UNCTAD, "The TRIPS Agreement and Developing Countries", 1996: 46.
- ¹⁶ Teran, H, "Intellectual property protection and offshore software development: an analysis of the U.S. software industry" *Minnesota Intellectual Property Review* 2, 2001: 1, citing statistics from Inter-American Development Bank of 1999.

- ¹⁷ Siwek, SE and Furchtgott-Roth, HW, *International Trade in Computer Software, United States*: Greenwood Press Wesport, Co, 1999; Vittal, N, “India’s new lever of growth”, *Computers Today*, 15 July 1993.
- ¹⁸ Dam, K. “Some economic considerations in the intellectual property protection of software”, *Journal of Legal Studies* 321, 1995.
- ¹⁹ Cohen, JE, “Reverse engineering and the rise of electronic vigilantism: intellectual property implications of ‘lock-out’ programs”. *Southern California Law Review* 68, 1995: 1091.
- ²⁰ For detailed information, see Vivas, D, “Identification and analysis of emerging and existing industries related to TRIPS Agreement in developing countries”, Geneva: AITIC, 2001, at http://www.tradeobservatory.org/library/uploadedfiles/Identification_and_Analysis_of_Emerging_and_Ex.htm.
- ²¹ See Andersen, B, Kozul-Wright Z and Kozul-Wright R, “Copyrights, competition and development: the case of the music industry”. Geneva: UNCTAD, discussion paper No. 145, 2000.
- ²² See Recording Industry Association of America, *Midyear Market Report on Latin Music Shipments, 1999*. The total United States music market is valued at \$ 9 billion.
- ²³ The South Africa Music Industry, 1996, at: www.dacst.gov/arts.za..
- ²⁴ The World Bank reports that it has lent about \$300 million to cultural activities. See “Developments in the music industry in Africa”, *World Bank Report on Social Development, 2001* <http://lnweb18.worldbank.org/essd/essd.nsf/All/CA8F5DDF16D1D00485256923006AE103>
- ²⁵ *Business Day* (Johannesburg), 21 November 2002; *Daily News* (Harare), 14 May 2003.

4 New Technologies

This chapter considers the IPR-related aspects of two technological fields of considerable strategic and economic importance in today's global economy that have experienced tremendous advances in recent years: biotechnology and information and communication technology (ICT).

Biotechnology

Biotechnology, the genomics revolution and developing countries

According to a report by the United States Office of Technology Assessment (1989): “biotechnology, broadly defined, includes any technique that uses living organisms (or parts of organisms) to make or modify products, to improve plants or animals, or to develop micro-organisms for specific uses.”

This definition is rather broad and would embrace what some experts refer to as the first-, second- and third-generation biotechnologies. The first generation includes traditional technologies like beer brewing and bread making, and the second begins with microbiological applications such as those developed by Louis Pasteur, which culminated in mass production by fermentation of the antibiotics. Tissue culture and modern plant and animal breeding also fall within this “generation”. The third generation biotechnologies or the “new biotechnologies” include recombinant DNA (“gene splicing”), hybridoma technology,¹ and genomics.²

The rate of advancement of biotechnology varies considerably in developing countries, depending on the capacity of their research institutions and businesses to generate biotechnological inventions. For example, Brazil, China, Cuba and India have adopted third-generation biotechnologies. However, the overwhelming bulk of biotechnology applications, even in these countries, are of the earlier generations, such as fermentation and tissue culture. While health biotechnology is more important than agrobiotechnology in the United States and Europe, in developing countries, such as India and Kenya, agro-

biotechnology has been made a priority. This is largely due to their dependence on the viability of their agricultural sector for food security and employment, and in many cases, for foreign exchange and political stability.

Given the likelihood that sequencing and analysing human, animal, plant and microbial genomes will take less and less time and money, one can anticipate a lowering of barriers to entry. This increases the likelihood of a few developing countries, such as Brazil, China and India, becoming sources of innovations in this field in the coming years. It is perfectly feasible, then, to envisage a time in the near future when a developing country like India will not just be a recipient of gene technologies and products but will be a provider to global markets as well.

Correa (2002) is of the view that while biotechnology may be applied in a wide range of activities in developing countries, and generate new industrial and trade opportunities, the most visible and profitable industrial applications, such as in pharmaceuticals, have largely been beyond the reach of most developing countries.³ A few cases show that with the appropriate infrastructure and policies, some developing countries have been able to modestly participate in the emerging market of bio-pharmaceuticals. Significant efforts from the private and public sector would be required, however, to exploit such opportunities, especially in order to catch up with new developments in genomics and other technologies. Correa adds that developing countries face

The rate of advancement of biotechnology varies considerably in developing countries

serious challenges in the field of agricultural biotechnology, including the risks posed to health and the environment by the release of genetically modified organisms (GMOs), the potential negative impact of GMOs for export to GMO-averse markets, as well as the risk of substitution of local produce by

GM crops grown in developed countries. The use of biotechnology in agriculture thus raises some fundamental dilemmas for developing countries, in view of their need to balance these risks with the potential it offers for increased production and poverty alleviation.

Intellectual property rights

As has been pointed out in this report, the IPRs regime cannot be separated from other policies and institutions that are concerned with the growth and development of a country. A solid national system of innovation is needed, including a basic R&D base, skilled personnel and a strong educational system, for a country to develop a particular industry and thus benefit from an IP regime (see discussions in chapter 3). While a few developing countries may be reaching this critical mass, their domestic research institutions and businesses are unlikely to be heavy users of patent systems, at least in the short term.

Developing countries need first to determine to what extent and how they wish to harness biotechnology for their economic development before designing an IPR regime that supports the objectives they decide to pursue. The TRIPS Agreement gives them some choice in terms of how they prefer to define a patentable invention in the context of biotechnology. Since discussing this first task is beyond the scope of this paper, the remainder of this section discusses how TRIPS deals with IPR protection of biotechnological inventions and how the relevant provisions may be interpreted.

But the truth of this proposition provides no definitive answer to the question of whether these countries should offer broad and strong patent protection in the field of biotechnology or take a TRIPS de minimis approach that excludes plants and animals, defines "micro-organism" narrowly, and opts for a sui generis alternative to patents for plant varieties. While many developing countries will prefer to opt for the latter approach, at least for the time being, it is worth pointing out that if biotechnological inventions were well protected, developing countries could conceivably benefit, even if there were few, if any, domestic patents applicants. This would depend on whether foreign firms are encouraged to transfer technologies to those countries or to establish R&D facilities there because of the existence of IPRs. But at this stage it is unclear whether strong IPR protection would make this happen. One complicating factor is that such business decisions depend on a range of factors, of which intellectual property may be just one of many. Professor John Barton from Stanford University is of the view that "based on factors such as market size and research capability, a developing nation should decide whether to adopt a UPOV style system in minimal compliance with TRIPS or instead to adopt a stronger biotechnology-oriented patent system".⁴

TRIPS makes no reference at all to biotechnology, but Article 27.3(b) of the Agreement deals with IPR protection of life-forms. It allows Members to exclude from patentability "plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes. However, Members shall provide for the protection of plant varieties either by patents or by an effective sui generis system or by any combination thereof."

With respect to products, plants and animals, it would mean that they may be excluded from patentability. As regards processes, essentially biological processes for the production of plants or animals may also be excluded. However, patents must be available for micro-organisms as products, and for non-biological and microbiological processes for producing plants or animals. Patent protection need not be available for plant varieties, but an effective IPR system is still obligatory. This may be a UPOV-type plant variety IPR system (see box 2.4), an alternative system yet to be devised, or some combination of systems (see also the discussion on the challenges posed by plant breeders rights to food security, under chapter 8, below.). Drawing distinctions between micro- and macro-biological

Article 27.3(b) of the Agreement deals with IPR protection of life-forms

processes is by no means easy, especially in the biotechnology age. Therefore, different jurisdictions are likely to draw the line in different places according to how these terms are understood in specific cases.⁵ Box 4.1 summarizes the relevant provisions of TRIPS.

Box 4.1: Article 27.3(b), TRIPS: a summary of its relevant provisions

WTO Members may exclude from patent protection:

- Plants
- Animals
- Essentially biological processes for the production of plants or animals
- Plant varieties

WTO members must provide protection for:

- Micro-organisms (by patents)
- Non-biological processes (by patents)
- Microbiological processes (by patents)
- Plant varieties (by an IP system which may be patents, a sui generis alternative, or a combination)

Much of the language in Article 27.3(b) is open to conflicting interpretations. For example, it is unclear whether an application relating to a genetically engineered plant would necessarily include plant varieties within its scope or not. This is important, because in some jurisdictions plants can be patented but plant varieties cannot; in others, neither can, but there may be a separate IPR system exclusively for plant varieties.

Since the language follows quite closely that of the European Patent Convention,⁶ it may be useful to examine how the European Patent Office (EPO), which allows plants to be patented but not plant varieties, has addressed this complex issue. In 1995, the Technical Board of Appeal of the EPO⁷ determined that a claim for plant cells contained in a plant is unpatentable since it does not exclude plant varieties from its scope. This implied that transgenic plants per se were unpatentable because of the plant variety exclusion. But in December 1999, the Enlarged Board of Appeal of the EPO declared that “a claim wherein specific plant varieties are not

individually claimed is not excluded from patentability under Article 53(b), even though it may embrace plant varieties”, but that “plant varieties containing genes introduced into an ancestral plant by recombinant gene technology are excluded from patentability”.⁸ It goes without saying that WTO Members do not have to follow this interpretation.

Even words like “micro-organisms” can be interpreted differently from one legal jurisdiction to another. According to the EPO, for example, “micro-organism” “includes not only bacteria and yeasts, but also fungi, algae, protozoa and human, animal and plant cells, i.e. all generally unicellular organisms with dimensions beneath the limits of vision which can be propagated and manipulated in a laboratory. Plasmids and viruses are also considered to fall under this definition.” This seems rather over-expansive since it is not at all obvious that a single cell from a multi-cellular organism is itself an organism, even if it has been cultured in a laboratory. There is no reason why developing countries should not define the term in a narrower sense if they consider it advantageous to do so.

TRIPS makes no reference to genes or DNA sequences. On the one hand, one could argue that DNA is merely a chemical. Consequently, complementary DNA (cDNA) sequences, which are produced in the laboratory and differ from their naturally occurring counterparts - in that certain sections of the molecule are “edited out” - should be patentable subject to fulfilment of the novelty, inventive step and industrial applicability requirements.

The alternative view is that the deletion of non-protein coding DNA is not inventive enough to deserve the reward of a patent. Why? Because a claimed cDNA molecule is likely to be obvious to somebody “skilled in the art” who might know the sequence of its naturally occurring equivalent. Furthermore, techniques for isolating and purifying DNA sequences are well known and no longer require a great deal of skill to use. But what if nobody knew about the naturally occurring equivalent? Such a claim should still arguably fail for the lack of an inventive step since the techniques employed have become routine (see box 4.2 on patenting natural substances).

The language in Article 27.3(b) is open to conflicting interpretations

Box 4.2: Patenting natural substances

TRIPS requires micro-organisms to be patentable, while plant variety rights must come under some kind of IPR system, but not necessarily patents. But what about genetic and biochemical resources? Must these also be patentable? Since they are not expressly excluded, patents must be made available for these, subject to the conditions that they be new, involve an inventive step and be capable of industrial application. Presumably these requirements mean that resources existing in nature cannot be patented. But is this correct?

In Europe and North America, which have the most experience in the patenting of apparently natural substances, there has never been any kind of blanket exclusion of certain types of invention on the basis that because they were not 100-per-cent human-made they could not be patented. For example, adrenaline was first patented in 1903, and insulin in 1923. Shortly after the Second World War, Merck was granted patents on two products extracted from a micro-organism called *Streptomyces griseus*: the antibiotic streptomycin and vitamin B12. While there was a general assumption that living things could not be invented, patents were occasionally granted in some countries on plants and micro-organisms. The United States even had a plant patent system from as early as 1930 for certain kinds of plants. But for most of the twentieth century the legal situation in Europe and North America was uncertain. From the 1970s, though, things became clearer as the scope of patent protection was extended not just to micro-organism products, but also to micro-organisms themselves, followed by plants and animals; and DNA sequences started appearing in patent applications in about 1980.

How can such products, some of which are obviously discoveries, be protected by patents as if they are inventions? The technical explanation is that patent law treats them as if they are chemical substances, and these have been patentable for at least 150 years. It is well established in the patent laws of Europe and North America that while you cannot claim as an invention something as it occurs in nature, it is possible to do so if you extract it from nature and thereby make it available for industrial utilization for the first time. This argument may not always convince a patent examiner or a court, but almost certainly will if a change is made to the substance or life-form in some way such as by adding something to it (e.g. a gene), subtracting something from it (i.e. purifying it), mixing it with something else to create a new or synergistic effect, or structurally modifying it so that it differs in an identifiable manner from what it was before. It also appears to be possible in some jurisdictions to get a patent on a natural substance by simply being the first to describe it in the language of biochemistry. Thus the South African Council for Scientific Research has a patent on certain compounds found in a plant called the hoodia which is used by the Bushmen as an appetite suppressant, and which the Council hopes will form the basis of a successful anti-obesity treatment. The patent may well provide the first biochemical description of how the plant produces its commercially promising effect, but the intended use of the plant would hardly be considered as novel by the Bushmen. According to the European Patent Convention's standards, though, the Council has a legitimate claim. The European Patent Office Guidelines for Examination state that: "if a substance found in nature has first to be isolated from its surrounding and a process for obtaining it is developed, that process is patentable. Moreover, if the substance can be properly characterised either by its structure, by the process by which it is obtained or by other parameters ... and it is 'new' in the absolute sense of having no previously recognised existence, then the substance per se may be patentable".

To a large extent, the patenting of DNA sequences and genes depends on how policy makers and the courts decide how the law should define novelty, or how they interpret the term if it is not explicitly defined. For example, most developed countries' patent laws and their courts allow "purified" or "isolated" DNA sequences to be patented as long as a credible use is disclosed. Other jurisdictions may

prefer to raise the novelty standards so that purification or isolation of a naturally occurring substance is insufficient to demonstrate novelty.

It has also been argued that allowing patents on genes and gene fragments is inadvisable because, for the reasons given earlier, such as increased transaction costs, it is likely to increase the cost of doing

research. Objections to such patents have also been raised on moral or religious grounds, as have patents on plants, animals and other life-forms.⁹

Such objections notwithstanding, the extent of patenting relating to DNA has increased tremendously in those jurisdictions that do allow it. According to Derwent Information, “DNA sequences first began appearing in patents in 1980, just 16 sequences all year. By 1990 that figure had risen to over 6,000 sequences. Throughout the 1990s the growth in the patenting of sequences expanded

exponentially, and this looks set to continue. In 2000 over 355,000 sequences were published in patents, a 5000 percent increase over 1990.”¹⁰

TRIPS Article 27.3(b) was to be reviewed by the Council for TRIPS in 1999. In fact, at the time of writing this report, the review was still going on. Many countries had submitted proposals concerning how the review should be conducted and suggesting changes to the language of the sub-paragraph.¹¹ However, it does not seem as if the review will result in any changes to the present text.

Information and communication technologies (ICT)

Electronic information-processing and communication is another key technological field in which tremendous advances have been achieved in a very short time. Like biotechnology, information technology has multiple industrial applications. The main sources of innovation in ICT are the software (see chapter 3 above), hardware, semiconductor and telecommunications industries. But there are also other types of business involved in the ICT sector that have an interest in intellectual property regulation including those that do not themselves innovate in this particular field, such as those which use ICT to provide services or “content” to consumers.

On the Internet such businesses can be divided into:

- World Wide Web browsers. This sector is essentially a duopoly, since virtually all computers use either Microsoft’s Internet Explorer or Netscape’s Navigator or Communicator.
- Internet service providers (ISPs), which enable users to access the Internet. These include companies like America On Line (AOL), CompuServe, and telecommunications companies.
- “Content” providers, which make information and creative works available on the Internet. These include publishing and media companies, non-profit organizations, universities and individuals.

- The content creators. These include authors and entertainment companies, who sometimes are also providers.
- E-commerce businesses. These include dedicated e-commerce firms (e.g. Amazon) and those using e-commerce in addition to more conventional means of selling goods and services to the public. These businesses have increased their presence in recent years.

Content providers tend to take a hard line on intellectual property rights, favouring protection as strong as, if not stronger than, the levels of copyright protection available to businesses operating in the more conventional environments such as print.

On the other hand, ISPs generally have little reason to favour strong copyright protection of Internet content, especially given the possibility of finding themselves held liable for the copyright infringements of their users. But this situation may change if other ISPs follow the example of one of the biggest, America On Line, which owns Netscape; it has merged with Time Warner to form AOL Time Warner, a new corporation which is not just an ISP but also a large-scale provider and creator of content.

Information technology has multiple industrial applications

Access is likely to be a greater priority than the promotion of innovation

ICT and developing countries

Although innovation in the field of ICT takes place in a number of developing countries, access is likely to be a greater priority than the promotion of innovation. In several ICT-related businesses such as software, hardware, semiconductors, telecommunications, and Internet service providers, the markets tend to be highly concentrated. This has not been the case so far with Internet content, but this situa-

tion may change. Therefore innovative start-up firms based in developing countries may find it difficult to grow. And while software and hardware products are often manufactured in developing as well as developed countries, the companies that design and sell the products capture most of the value by far (see chapter 3).

The ICT revolution has pushed the boundaries of the IPR system

Intellectual property rights

While there is nothing new in patenting telecommunications technologies or copyrighting books and motion pictures, the ICT revolution has pushed the boundaries of the IPR system in a number of different ways, and it has the potential to push them still further. For example, though software programs are, arguably, no more than a long sequence of binary-coded instructions to a computer, copyright law nowadays treats them as if they are literary works. In the United States, programs are now patentable as well. There are two types of software-related intellectual product that may be regarded as an invention in some jurisdictions: “a) computer programs that produce a technical effect within the computer or on other hardware components; and b) computer programs that produce technical effects different from those described in (a), entailing changes in the state of physical matter such as effects on equipment applied to a specific industrial task.”¹² In the United States it is possible to obtain patents for both types. In Europe, programs are not patentable officially, although patents on type (b) inventions have been granted.

semiconductor-producing countries. Thus, while it was incorporated by reference into TRIPS, modifications were made that strengthened the rights provided.

As for digital information, views on the applicability of IPRs vary, from some who believe that IPRs are completely inappropriate, to others who contend that IPRs have evolved over time and that there is nothing new for them to accommodate into new technologies even while there may be problems at first. Among the former are those who believe that “information wants to be free”,¹³ and that attempting to use IPRs only holds up technological development while intruding on freedom of expression. Many, if not most, others hold to a view somewhere in between.¹⁴

Software and database producers use copyright law not only to protect expressions but also to limit access to information. For example, software developers in the United States can copyright the code of their programs without having to fully disclose it. Additional protection can be secured by keeping the source code secret (and thereby protecting it under trade secrecy law), and through restrictive licences.

The semiconductor manufacturers came up with a different approach to the software industry. They deemed existing IPRs to be unsuitable for the protection of their chip designs and successfully lobbied for a sui generis system, first in the United States and now globally through the TRIPS Agreement. The United States legislation, passed in 1984, is known as the Semiconductor Chip Protection Act (SCPA). To a large extent, the SCPA provided the model for the 1989 WIPO Treaty on Intellectual Property in Respect of Integrated Circuits (Washington Treaty). Despite this, the agreed text of the Treaty was not fully to the satisfaction of the main

Developing countries are required, under TRIPS, to protect software by means of copyright law and semiconductor designs through the sui generis system. However, TRIPS does not explicitly state that they have to allow the patenting of programs, although they may be required to do so under the terms of bilateral free trade agreements (see the discussion in chapter 2, above). It is possible to argue that since patents must be available for all fields of technology, protection must be extended to computer programs. But this may not necessarily be

the case. The European Patent Convention expressly disallows the patenting of computer programs. The reason is that legal protection of inventions requires evidence of a technical contribution to the state of the art. Computer programs as such are not considered to meet this requirement. But in spite of this, the European Patent Office and national patent offices in Europe have so far granted thousands of patents for computer-implemented inventions, including over 20,000 by the EPO alone.¹⁵

The two 1996 “Internet treaties” - the WIPO Copyright Treaty (WCT) and the WIPO Performers and Phonograms Treaty (WPPT) (see chapter 2) - are particularly important since they attempt to meet the challenge of a new and rapidly expanding field of mass communications: the Internet. While the Internet was clearly becoming a promising new medium for making intellectual works available to the public, concerns were raised that in the digital environment, opportunities for large-scale counterfeiting were massively increased. Moreover, copyright enforcement was also highly problematic because members of the public and competitors could access Internet content from virtually anywhere in the world. There were also concerns that technological barriers to copying could never be totally secure. That is why content providers are not only developing ever more sophisticated technological barriers to copying, but are also keen to prevent the production, use and dissemination of technologies which aim at, or are merely capable of, circumventing those barriers. The new anti-circumvention measures seek to restrict access to works as well as allowing owners of IPRs to deny users their lawful rights of usage under any of the fair use/fair dealing or educational exceptions.

While these concerns motivated certain WIPO member States to lobby for new norms to address these problems, a quite different concern was also raised at the 1996 conference at which the above treaties were negotiated and adopted. This other concern was that the creation of new norms, if driven purely by the interests of content producers, could lead to overprotection, thereby upsetting the mutually beneficial balance between the interests of (a) the public, (b) the content producers, who are likely to be copyright owners of such content, and (c) the content access providers, such as Internet service providers and libraries. Because many of the

delegates accepted the need to address this matter, the agreed texts of the two treaties are generally considered to reflect a much more reasonable balance between the different interests involved than there might have been. Thus the basic premise of the WIPO treaties acknowledges that there is a need to maintain a balance between rights of authors and the wider public interest, particularly with respect to education, research and access to information. In this regard, one important feature of the WCT and the WPPT is the possibility of establishing limitations and exceptions in national legislation in special cases, that do not conflict with the normal exploitation of the work and do not unreasonably prejudice the legitimate interest of the authors. These types of exceptions are optional and have to be implemented through national law.

Nonetheless, subsequent copyright reforms in a few countries have gone so far as to outlaw the circumvention of technological barriers, not only to illicit copying but also to uses that may be perfectly legal because, for example, they constitute fair dealing or the copyright has expired anyway. Moreover, most users are not technologically capable of circumventing digital lock-up systems by themselves; they require devices or software created by other users. In many regions, such as the United States and the EU, both the manufacture and the distribution of such devices is outlawed (for further discussion of the challenges posed by these developments, see chapter 9, below).

The Report of the Commission on Intellectual Property Rights (see box 1.2) cautions developing countries on these new developments. It concludes that:

“Users of information available on the Internet in the developing nations should be entitled to ‘fair use’ rights such as making and distributing printed copies from electronic sources in reasonable numbers for educational and research purposes, and using reasonable excerpts in commentary and criticism. Where suppliers of digital information or software attempt to restrict “fair use” rights by contract provisions associated with the distribution of digital material, the relevant contract provision may be treated as void. Where the same restriction is attempted through technological means, measures to defeat the technological means of protection in such circumstances should not be regarded as

The premise of the WIPO treaties acknowledges a need to maintain a balance between rights of authors and the wider public interest

illegal. Developing countries should think very carefully before joining the WIPO Copyright Treaty and other countries should not follow the lead of the US

and the EU by implementing legislation on the lines of the DMCA or the Database Directive."

(Report of the Commission: 109)

CHAPTER 4: END NOTES

- ¹ Hybridoma cells result from the fusion of a type of cancer cell known as a myeloma with another antibody-producing cell. Hybridomas produce multiple antibodies of a highly specific type, which are called monoclonal antibodies. The technology has considerable potential in both diagnostics and therapeutics.
- ² Genomics refers to the mapping, sequencing and analysis of the full set of genes (i.e. the genome) of different organisms or species. The human genome has always been the most interesting for governments and foundations, as well as for companies seeking to identify commercial applications from genomics.
- ³ Correa, C, "From biotech innovation to the market - Economic factors driving developing economies' competitiveness in biotech production", in Meléndez Ortiz, R and Sánchez, V, *Trading in Genes: Development Perspectives on Biotechnology, Trade and Sustainable Development*. London: Earthscan, 2003 (forthcoming).
- ⁴ Barton, J, "Nutrition and Technology Transfer Policies", UNCTAD-ICTSD, 2003 (forthcoming).
- ⁵ See Cornish op cit: 226-227.
- ⁶ See the *Resource Book*, Part 2.5.5, on Article 27.3(b) of TRIPS.
- ⁷ In *Greenpeace v. Plant Genetic Systems*, 1995.
- ⁸ EPO Decision G 01/98 - <http://www.european-patent-office.org/dg3/biblio/g980001ex1.htm>.
- ⁹ See Bruce, D and Bruce A, "Engineering Genesis - The Ethics of Genetic Engineering in Non-human Species", London: Earthscan, 1998: 223-244. See also Joint Communication from the African Group to the Council for TRIPS of 26 June 2003 (IP/C/W/404), which states: "Patents on life forms are unethical and the TRIPS Agreement should prohibit through modifying the requirements to provide for patents on micro-organisms and on non-biological and microbiological processes for the production of plants or animals. Such patents are contrary to the moral and cultural norms of many societies in Members of WTO."
- ¹⁰ http://www.derwent.com/ipmatters/2001_01/genetics.html.
- ¹¹ See in particular the proposals made by the African Group (WTO document WT/GC/W/202 and IP/C/W/404) and by India (WTO document WT/GC/W/147) with respect to the relationship between the TRIPS Agreement and the CBD. These proposals are presented in the *Resource Book*, Part 2.5.5 (on Article 27.3(b) of TRIPS).
- ¹² Correa, 2000, op cit: 134.
- ¹³ For example, Barlow, JP, "The economy of ideas: everything you know about intellectual property is wrong", *Wired*, March, 1994.
- ¹⁴ For example, McManis, CR, "Taking TRIPS on the information superhighway: international intellectual property protection and emerging computer technology", *Villanova Law Review* 41(1), 1996: 207-288; Samuelson, P, "A case study on computer programs", in Wallerstein, MB, Schoen RA and Moge ME (eds), *Global Dimensions of Intellectual Property Rights in Science and Technology*, Washington, DC: National Academy Press, 1993.
- ¹⁵ European Commission (2002), "Proposal for a directive of the European Parliament and of the Council on the patentability of computer-implemented inventions" [COM (2002) 92 final].

5 Technology Transfer

One assumption of the TRIPS Agreement is that the "protection and enforcement of intellectual property rights" would contribute "to the transfer and dissemination of technology" (see box 2.3, above). Moreover, the Agreement stipulates that developed countries shall provide incentives to their enterprises and institutions for the purpose of promoting and encouraging technology transfer to least developed countries. It is also argued that stronger IPRs would be an inducement to foreign direct investment (FDI) - one of the channels for transfer of technology. It is therefore relevant to consider how these issues relate to each other, particularly in the context of a developing country.

Developing countries: net importers of technology

Given that most developing countries are net importers of new technologies and products, a critical source of technical change is incoming technology transfer. Technology transfer is a complex process, involving the shift of codified knowledge, know-how and management techniques.

It is fair to say that stronger IPRs reduce the scope for informal technology transfer via imitation, which was an important form of learning and technical change in such economies as Japan and the Republic of Korea (not to mention the United States). TRIPS has narrowed the options in this regard and raised the costs of imitation. At the same time, stronger patents, trademarks and trade secrets should reduce the costs of achieving formal technology transfer and expand such flows. However, evidence on this is not conclusive.

Formal private-sector technology transfer "is a commercial operation that takes place through firm-to-firm arrangements and involves flows of knowledge, be they embodied in goods (as in the sale of machinery and equipment) or in the form of ideas, technical information and skills (through licensing, franchising or distribution agreements) and

movement of experts and skilled labour.¹ Technology transfer can take place at arm's length, as in the case of the export of capital equipment or of licensing agreements between unaffiliated firms, or it can be internalised through the transfer of new production techniques within a transnational corporation, between affiliate firms".² Informal technology transfers can also take place on a large scale, and in those countries at the early stages of industrialization these may be far greater in number than formal transfers. Informal transfers can take place through printed information (such as sales catalogues, blueprints and technical specifications); observations made during visits to foreign plants; return of native, foreign-trained professionals; and the presence of foreign engineers.³ By definition, informal transfers are not based on any monetary transaction or legal agreement. If IPRs exist to create markets for knowledge, such transfers presumably do not depend at all on the existence of IP protection. The remainder of this chapter deals with formal transfers.

There are several formalized means of transferring technologies, which include FDI, joint ventures, wholly owned subsidiaries, licensing, technical-

A critical source of technical change is incoming technology transfer

service arrangements, joint R&D arrangements, training, information exchanges, sales contracts and management contracts.⁴ Of these, FDI in some form

or another is the main channel for technology transfer flows.⁵

IPRs and technology transfer

The relationship between levels of IPR protection and the volume and direction of inward technology flows is highly complex, and is likely to involve many factors whose relative importance will vary widely from one country to another. Theoretically, it seems logical to assume that IPR availability would be a prerequisite for the international transfer of new technologies, *at least those that can be easily copied*. One would expect companies to be reluctant to lose control over technologies, which may have cost them millions of dollars to develop, to countries where domestic firms could adopt the technologies and produce goods that would compete with those of the technology owners.⁶ Accordingly, the only way that companies would feel encouraged to transfer proprietary technologies is where IPR protection is strong enough for them to charge licence fees high enough to reflect the costs of innovation, or alternatively by means of FDI or joint ventures where they maintain more control over those technologies.⁷ According to Maskus,⁸ in countries with strong IPR protection and enforcement, transnational corporations (TNCs) are likely to favour technology licensing agreements and joint ventures. In countries with weak IPRs, FDI would be the favoured business strategy in overseas markets.⁹ Lall expresses the view that in the longer term, countries seeking to attract high-tech production systems should strengthen their IPR regimes with a view to inducing TNCs to deepen their investments into more advanced technologies.¹⁰

However, a great deal of formal international “technology transfer” takes place not between, but *within*, companies. Given that these companies continue to control access to the technologies, it seems reasonable to question whether such transactions are genuine technology transfers of the kind that would result in widespread adoption in developing countries. A counter-argument can be made that the *overall* effect of IPRs will inhibit technology transfers.

The views of the critics who argue that IPRs inhibit

technology transfer and reinforce North-South inequalities can be summarized as follows. As an intervention in the free market, patents restrict the number of people who could otherwise freely make, use, sell or import the protected products and processes. This enables owners to maintain high prices, avoiding a situation where the price of their products or processes is driven down towards the marginal cost of reproduction. Foreign patent owners can use their legal rights either to block access to their technologies or to charge licence fees that are too high for domestic firms. If so, one might argue that the best ways for developing-country governments to help domestic firms and public institutions to acquire technologies might be to weaken patent rights, such as by allowing compulsory licensing on licensee-friendly terms. According to Reichman and Hasenzahl “about one hundred countries recognised some form of non-voluntary licensing in their patent laws by the early 1990s.”¹¹

This may not be the case, though, since reading a patent specification is unlikely to be sufficient to gain access to a technology. There are three reasons for this. First, patents do not necessarily disclose the invention to the extent that a person skilled in the art could manufacture it. Undisclosed tacit knowledge is often essential for reproducing an invention. Also, “in the public domain” is not synonymous with “freely available”. According to Stuart Macdonald of Sheffield University, “Legal fiction maintains that all the information needed to re-create the invention is contained in the patent specification. The fact is that the specification is forced to refer again and again to other information, information that is in the public domain, which means that it is available somewhere but must be acquired from these sources before the information in the specification can be used. Much of this information will be tacit and uncodified information [i.e. know-how].” Moreover, “the information contained in patent specifications is available only to those who consult them directly, or who pay others more adept at arcane classifica-

The relationship between levels of IPR protection and the volume and direction of inward technology flows is highly complex

tions and the language of lawyers to do so.”¹² ¹³ Second, the possibility to take commercial advantage of information disclosed in expired patents may be precluded by multiple overlapping IPR portfolios. For example, companies sometimes apply for further

patents or use trademarks or copyright protection as a means of extending the life of a monopoly beyond the expiry date of the original patent. Third, many developing countries lack the institutional capacity to adopt and adapt new technologies.

Patent ownership is heavily skewed in favour of the North

Who owns patents?

As for the geography of patent ownership, this is heavily skewed in favour of the North. Patent Cooperation Treaty statistics for 1998 and 2000 show that despite increased developing country membership in recent years, the vast majority of PCT applications continue to be filed by companies based in North America, Western Europe or Japan (table 5.1). Since such companies are the main users of the patent system, in the short term at least, they will be the major beneficiaries of new patent laws in developing countries. And, given the economic power of these

companies, it may be more difficult than ever for developing countries to negotiate favourable terms for technology. Drahos suggests a worst-case scenario: “If it turns out that the global market in scientific and technological information becomes concentrated in terms of the ownership of that information, it might also be true that the developmental paths of individual states become more and more dependent upon the permission of those intellectual property owners who together own most of the important scientific and technological knowledge.”¹⁴

Empirical evidence

What is the empirical evidence concerning the links between stronger IPRs, investment flows, R&D and technology transfers? The data produced so far are hardly conclusive, and suggest that FDI decisions may depend on a host of factors including the general investment climate. A study by Maskus¹⁵ claimed some evidence of a positive correlation, while conceding that IPRs are one of several factors that may facilitate technology transfers, and also that strengthening IPRs will involve unavoidable costs¹⁶ as well as benefits for developing countries.¹⁷ A World Bank study was even more cautious and recommended further research before firm conclusions could be drawn.¹⁸ Evidence from Turkey¹⁹ found that the banning of pharmaceutical patents appeared to have no significant effects on levels of FDI, technology transfers or domestic innovation. Similarly, a study on Brazil, taking the manufacturing industry as a whole, found no evidence that FDI levels were greatly affected by patent protection.²⁰ On the other hand, Mansfield’s well-known study (1994),²¹ based on interviews with intellectual property executives of United States corporations in several industrial sectors, indicated that a large

proportion of respondents from the chemical and pharmaceutical industries said their FDI decisions were affected by the levels of IPR protection available.

Research by Kim for the UNCTAD-ICTSD Project on the experience of the Republic of Korea suggests that “strong IPR protection will hinder rather than facilitate technology transfer and indigenous learning activities in the early stage of industrialisation when learning takes place through reverse engineering and duplicative imitation of mature foreign products.” He also concludes that “only after countries have accumulated sufficient indigenous capabilities with extensive science and technology infrastructure to undertake creative imitation in the later stage that IPR protection becomes an important element in technology transfer and industrial activities.”²²

Similarly, Kumar found that in the East Asian economies he studied (i.e. Japan, the Republic of Korea and Taiwan Province of China), a combination of relatively weak IPR protection and the availability of second-tier IPRs, such as utility models and design

Much uncertainty remains as to the effects of IPRs on technology transfers to developing countries

patents, encouraged technological learning. (See additional discussion in chapter 3, above). The second-tier systems encouraged minor adaptations and inventions by local firms. Later on, the IPR systems became stronger partly because local technological capacity was sufficiently advanced to generate a significant amount of innovation, and also as a result of international pressure. India's experience is somewhat similar, except that no

second-tier protection was provided. This did not hurt the chemical or pharmaceutical industries, but may have hindered the development of innovative engineering industries.²³

In short, much uncertainty remains as to the effects of IPRs on technology transfers to developing countries. But there is empirical evidence to suggest that their effects depend on the level of development of

Table 5.1: Geographical origin of patent applications filed under the Patent Cooperation Treaty, 1998 and 2000

Region	Country of origin	No. of patents filed, 1998	No. of Patents filed, 2000	% of total 1998	% of total 2000
North America	USA	28,356	38,171	42.3	42.0
	Canada	1,315	1,600	2.0	1.8
Total North America		29,671	39,771	44.3	43.8
Western Europe/EU	Germany	9,112	12,039	13.6	13.2
	United Kingdom	4,383	5,538	6.5	6.1
	France	3,322	3,601	5.0	4.0
	Sweden	2,554	3,071	3.8	3.4
	Netherlands	2,065	2,587	3.1	2.8
	Switzerland	1,293	1,701	1.9	1.9
	Finland	1,092	1,437	1.6	1.6
	Italy	925	1,354	1.4	1.5
	Denmark	624	789	0.9	0.9
	Austria	421	476	0.6	0.5
	Norway	394	470	0.6	0.5
	Others	1,101	1,463	1.6	1.6
Total Western Europe/EU		27,286	34,526	40.7	38.0
East Asia and China	Japan	6,098	9,402	9.1	10.3
	Rep. of Korea	485	1,514	0.7	1.7
	China	322	579	0.5	0.6
Total East Asia & China		6,905	11,495	10.3	12.6
Eastern Europe	Russian Federation	429	590	0.6	0.7
	Others	402	627	0.6	0.7
Total Eastern Europe		831	1,217	1.2	1.3
Australasia	Australia	1,048	1,627	1.6	1.8
	New Zealand	178	264	0.3	0.3
Total Australasia		1,226	1,891	1.9	2.1
Total Middle East		707	925	1.1	1.0
Total Rest of Asia		146	473	0.2	0.5
Total Latin America/Caribbean		209	252	0.3	0.3
Total Africa		26	398	<0.1	0.4
Total applications		67,007	90,948	100.0	100.0

a country, the specific technological fields involved, and the behaviour and absorptive capacity of individual firms.²⁴ Accordingly, stronger IPR regimes are likely to benefit some countries, harm others and make no difference in yet others. But bearing in mind the highly concentrated market structures of some industries, the bargaining power of all developing countries and their companies in those industries is likely to be weak, and getting weaker still, especially the smaller countries that are unlikely to be an important market for the technology-owning firms. But the situation is not entirely bleak; there is some evidence from Africa to suggest a certain willingness of TNCs to share technologies on concessional terms.²⁵ However, often this is only as long as domestic companies do not produce competing products for sale in that market or abroad.

Simply strengthening and enforcing IPRs will not be sufficient to induce much more innovation and technology transfer. Experience from other countries suggests that a number of other factors are at least as important in establishing and benefiting from these processes. After all, innovation requires investment, suggesting that economies need to

provide an environment in which long-term investments and risk-taking can thrive.

In summary, one can say empirically, that intellectual property protection is one of many factors influencing firms' decisions to transfer technology to, or to invest in, a particular country. Therefore, it becomes evident that the effects of strengthened IP protection are often dependent on its interrelationship with the effects of other factors, such as the size of the domestic market, the structure of factor supply, productive infrastructure and the degree of stability of the macroeconomic environment. It is also worth noting that the theory and evidence available to date are based on the existence of different levels of IPRs in various countries. The question remains as to how the effective reconciliation of varying national IPR systems to the new, higher standards will affect the relative positions of countries in their IPR rankings and how this change will influence the global distribution of FDI flows. It is fair to expect that the other determinants of FDI and licensing will assume added importance.²⁶

CHAPTER 5: END NOTES

- ¹ Governments are also involved in technology transfer. Informal and free-of-charge technology transfers are also possible.
- ² Roffe, P, "Transfer of technology and competition policy in the context of a possible multilateral investment agreement", in Picciotto, S and Mayne R (eds), *Regulating International Business: Beyond Liberalization*, Basingstoke: Macmillan Press 1999:151.
- ³ Kim, L. 2002, op cit.
- ⁴ Mugabe, J and Clark, N, "Technology transfer and the Biodiversity Convention: issues of conservation and sustainable use", *Science, Technology and Development* 14 (3), 1996: 1-31.
- ⁵ See UNCTAD, "World Investment Report 2001", chapter 4 [hereinafter WIR]; and UNCTAD, *WIR 1999*, chapter VII. See also Radosevic, S, "International Technology Transfer and Catch-up in Economic Development", Cheltenham: Edward Elgar, 1999: 28.
- ⁶ Technologies cannot necessarily be easily be copied. Moreover, with technologies that can be copied, not all developing countries have the capacity to do so or make use of them. India and Brazil are much better placed than, say, a least developed country to copy advanced foreign technologies.
- ⁷ But having made this point, licensing agreements can also be quite restrictive with respect to the licensees' freedom to use and profit from the technologies.
- ⁸ Maskus, K, "Intellectual Property Rights in the Global Economy", Washington DC: Institute for International Economics, 2000: 123.
- ⁹ Similarly, Vishwarao suggests the possibility that gains for developing countries from lack of IPR protection would be "offset by strategic behavior by Northern firms who opt for technology transfer via subsidiary or monopoly production" (Vishwarao, S, "Intellectual property rights and the mode of technology transfer", *Journal of Development Economics* 44, 1994: 381-402).
- ¹⁰ See Lall and Albaladejo, op. cit: 15.
- ¹¹ Reichman J and Hasenzahl C, "Non-voluntary Licensing of Patented Inventions: Historical Perspective, Legal Framework under TRIPS, and an Overview of the Practice in Canada and the United States of America". Study undertaken within the framework of the UNCTAD-ICTSD Capacity-Building Project on IPRs and Sustainable Development, Geneva, UNCTAD-ICTSD, 2002. Available at http://www.ictsd.org/iprsonline/unctadictsd/docs/reichman_hasenzahl.pdf
- ¹² The relevance of tacit knowledge goes further than merely casting doubt on the notion of patents as a reward for disclosing an invention. Even without patents, companies may enjoy a powerful position, since those wishing to acquire tacit knowledge may have no alternative but to license it from holding firms. See Macdonald, S, "Exploring the hidden costs of patents", *QUNO Occasional Paper* No. 4, Geneva: Quaker United Nations Office, 2001.
- ¹³ This situation may be changing somewhat with patent databases being placed on the Internet.
- ¹⁴ Drahos, P, "States and intellectual property: the past, the present and the future", in Saunders, D and Sherman, B (eds), *From Berne to Geneva: Recent Developments in Copyright and Neighbouring Rights*, Brisbane: Australian Key Centre for Cultural and Media Policy and Impart Corporation, 1997.
- ¹⁵ Maskus, 1998, op cit
- ¹⁶ In terms of legislation, administration and enforcement. See discussions in chapter 2 above.
- ¹⁷ See also United Nations Conference on Trade and Development, *The TRIPS Agreement and Developing Countries*, 1996, op. cit.; Finger, JM and Schuler, P , "Implementation of Uruguay Round commitments: the development challenge". Presented at the WTO/World Bank Conference on Developing Countries in a Millennium Round, WTO Secretariat, Geneva, 20-21 Sept. 1999.

- ¹⁸ Primo Braga, CA and Fink, C, “International transactions in intellectual property and developing countries”. Mimeo. Washington, DC: World Bank 1999.
- ¹⁹ Kirim, AS, “Reconsidering patents and economic development: a case study of the Turkish pharmaceutical industry”, *World Development* 13 (2), 1985: 219-236.
- ²⁰ Kondo, EK, “The effect of patent protection on foreign direct investment”, *Journal of World Trade* 29(6), 1995: 97-122.
- ²¹ Mansfield, E, “Intellectual property protection, foreign direct investment and technology transfer”, Washington, DC, International Finance Corporation, Discussion Paper No. 19, 1994.
- ²² Kim, L, 2002, op. cit.
- ²³ Kumar, N, “Technology and Economic Development: Experiences of Asian Countries”, London: Commission on Intellectual Property Rights Intellectual Property Rights, 2002.
- ²⁴ Kim L, 2002, op cit.
- ²⁵ See Stokes, K, “Intellectual property rights and the transfer of biotechnology to Zimbabwe”, *Biopolicy International* No. 20, Nairobi: ACTS Press, 1998.
- ²⁶ See UNCTAD, 1996, op.cit.: 18.



III

INTELLECTUAL PROPERTY AND SOCIAL & DEVELOPMENT ISSUES: THE CHALLENGES

The paper has so far analysed the global architecture of IPRs and the broad, cross-cutting issues that deserve attention when designing IPR policies. Part Three focuses on specific areas of concern for developing countries in the implementation of new IPR standards: health; food, agriculture and biodiversity; traditional knowledge and folklore; and access to knowledge in general, including educational technical and scientific information.

6 Health

Chapter 6 discusses one of the most controversial aspects emerging from efforts at extending intellectual property protection to areas that were not fully covered in the pre-TRIPS era. In this context, this chapter considers the relevance of IPRs to the pharmaceutical sector, and provides an overview of international deliberations on this topic, particularly in the context of the Doha Declaration.

Introduction

In the past few years, attention has increasingly focused on the relationship between patents and the availability and price of essential drugs. In particular, a number of governments, as well as non-governmental organizations (NGOs) concerned with health and development, have condemned pharmaceutical companies for taking advantage of their exclusive rights accorded by patents. They allegedly do this first, by charging high prices for treatments,

including for diseases which affect a large number of poor people who cannot afford them; second, by putting pressure on developing-country governments to prevent the local manufacture or import of cheaper, copied versions of the drugs produced in countries where they cannot be patented. In addition, they are criticized for not undertaking R&D on diseases affecting poor people.

Relevance of intellectual property to pharmaceuticals

Under the TRIPS Agreement all WTO member countries became bound to grant patents for pharmaceutical products. This obligation did not exist under previous international conventions. When the Uruguay Round negotiations began, more than 50 countries in the world did not grant such protection, thereby enabling the commercialisation of low-cost, non-patented products. In addition, the Agreement obliged Members to reinforce rights conferred under process patents, and to protect - against unfair commercial use - the information submitted for the marketing approval of drugs.¹ The new obligations also included granting patent protection for at least 20 years from the date of application, limiting the scope of exemptions from patent rights and obligations, and effectively enforcing patent rights through administrative and judicial mechanisms (see chapter 2 above).

These rules dramatically changed the legal framework for the production and commercialisations of and access to drugs in developing countries, despite the fact that, as examined elsewhere,² the TRIPS Agreement provided certain leeway for member States to adopt measures to mitigate the monopolistic rights conferred by patents and promote competition. Such measures, which may lower prices and increase access to drugs include, notably,

- *compulsory licences*, that is, authorization by the State to a third party to exploit a patented invention, generally against a remuneration to the patent holder;
- *parallel imports* of patented products when they are obtainable in a foreign country (where a patent also exists) at lower prices; and

Under the TRIPS Agreement all WTO member countries became bound to grant patents for pharmaceutical products

- the possibility of establishing *exceptions* to the exclusive rights, such as the *early working exception* (also known as “Bolar exception”), which allows generic firms to initiate and obtain marketing approval of a patented drug before the expiration of the patent.

Some governments and the pharmaceutical industry objected to the use of some of these flexibilities, although they are TRIPS-consistent and increase allocative efficiency. In South Africa, national legislation established provisions allowing for the parallel importation of medicines, in certain circumstances, and provided also for compulsory licensing. These and other aspects of the legislation were challenged by 39 pharmaceutical companies and the South African Pharmaceutical Manufacturers Association (PMA) before that country’s Supreme Court. Development aid to South Africa was also conditioned on the withdrawal of such provisions.³ After a global NGO campaign, led by activists from the United

States, Africa and Asia, the legal action was withdrawn. A complaint was also initiated in WTO against Brazil, challenging legislation that authorizes the granting of compulsory licences and parallel imports in instances when patent holders have not worked (i.e. produced) locally. This complaint was also withdrawn, but the potential conflict between patents and public health became an important issue in several international fora. The World Health Assembly, for example, addressed the subject in a resolution on the Revised Drug Strategy in 1996.⁴ Subsequent resolutions adopted by the World Health Assembly in 2001⁵ required the World Health Organization (WHO) to evaluate the impact of the TRIPS Agreement on access to drugs, local manufacturing capacity and the development of new drugs.⁶ WHO-sponsored studies over the past decade provide an indication of the potential effects of the TRIPS Agreement in the area of pharmaceuticals (see box 6.1).

Box 6.1: Impact of the TRIPS Agreement on Pharmaceuticals: Studies in Thailand and Brazil

A study undertaken in Thailand on the impact of that country’s 1992 revised patent law, which essentially applies the same standards as those required by the TRIPS Agreement, found that there had been no significant increase in transfer of technology or FDI, and that spending on pharmaceuticals had increased at a higher rate than overall health care spending.

Another study on the implications of the new Industrial Property Code (1996) on local production and access to medicines in Brazil revealed, inter alia, that:

- Of the 1,387 drug patent applications filed since 1996, when the new Brazilian Industrial Property Act was signed into law, only 36 (2.6 per cent) were filed by residents of Brazil compared with more than 500 by United States residents.
- While Brazil’s total imports roughly doubled during the period 1982-1998, pharmaceutical imports increased more than 47 times.⁷

The relationship of patents and public health is, indeed, complex. On the one hand, patents are not the only factor that plays an important role in determining access to drugs.⁸ Other factors, such as infrastructure and professional support, are also significant. But, at least in principle, patent monopolies place the companies holding them in a strong position to set prices at high levels, and this can have a profound impact on the ability of poor people to acquire them. These issues have been brought to the fore by the current HIV/AIDS pandemic, which is now one of the most serious

public health crises the world is facing. Africa is the most severely affected continent. Millions of infected people there are doomed to die over the next few years unless they can be treated with anti-retroviral drugs. Yet in many developing countries, only a very small proportion of HIV/AIDS sufferers receive these treatments.⁹ Poor people often live far away from clinics and hospitals. Also, many countries are short of medical practitioners trained to prescribe drugs for the treatment of HIV/AIDS in the appropriate combinations and dosages. And of course high prices, which the companies can set due to

their patent exclusive rights, obviously do affect the ability of poor people to acquire them.

On the other hand, drug companies rely heavily on patents to recoup their R&D costs and obtain profits. Several studies¹⁰ have shown that patents are particularly important to the pharmaceutical industry, given the high costs of R&D, and the fact that once a new drug has been developed, knowledge of the molecular structure becomes public (because of regulations for marketing approval) and, hence, competitors may easily copy it. The “research-based” pharmaceutical industry claims that a globally strong patent system is essential for them to remain in the highly expensive business of discovering and developing new drugs. Its corporations are also concerned that if copying is allowed in developing countries, these drugs will be exported to developed-country markets, where these corporations make most of their profits. They also point out that 95 per cent of drugs on the WHO’s essential drugs list can be legally copied, either because the patents have expired or because they had never been patented (see box 6.2). However, the adverse

welfare implications of having even a small per cent of these drugs covered by patents (i.e. on-patent) is still extremely serious, since the WHO’s list does not include every drug that could reasonably be classed as “essential”. In fact, it is partly the relative cheapness of the drugs listed that makes them “essential”, and thus worthy of inclusion.

Though the role of patents in inducing R&D in pharmaceuticals is clear, the industry’s arguments about the need for a strong patent system in developing countries have been called into question. Doubts have been raised about the following: the actual costs of R&D involved in the development of new drugs (especially as compared to the marketing costs of pharmaceutical companies); the important role that public funding plays in the discovery of new drugs; the use of patents to protect a myriad of minor developments and prevent or delay the entry of generic products after patent expiry; and the justification for extending to developing countries the same model of patent protection applied in developed countries.¹¹

Drug companies rely heavily on patents to recoup their R&D costs and obtain profits

Box 6.2: Patents on HIV/AIDS drugs: do they affect access?

Defenders of the position that patents do not hinder access to essential medicines in Africa point to a study in 2001 by Amir Attaran of Harvard University and Lee Gillespie-White of the International Intellectual Property Institute, a Washington-based organization.¹² It provides data on the extent of patent protection throughout Africa of 15 anti-AIDS drugs, which show that few of these have been patented widely anywhere on the continent, except in a few countries including South Africa. This finding suggested to the authors that “patents and patent law are not a major barrier to treatment access in and of themselves”.

But others have argued that while the study’s data are probably accurate as far they go, the study does not make a convincing case that patents do not obstruct access to treatment in Africa. Five organizations, Consumer Project on Technology, Essential Action, Oxfam, Treatment Access Campaign and Health Gap, distributed a joint statement rebutting the Attaran and Gillespie-White paper, and several other campaigners added criticisms of their own which were distributed on an e-mail news service called IP Health. Another response was circulated by the South African activist group, Treatment Action Campaign.

They had three main criticisms. First, anti-retroviral (ARV) drug patent coverage tends to be quite comprehensive in countries that have large populations and/or relatively high incomes *and* large numbers of HIV/AIDS sufferers. These include South Africa, Kenya and Zimbabwe. According to the rebuttal statement, “the 23 countries in Sub-Saharan Africa that have 4 or more ARV products on patent have 53 percent of the HIV+ patients and 68 percent of the Region GDP. The 20 Sub-Saharan countries that have patents on 6 or more ARV products have 46 percent of the patients and 56 percent of the region’s GDP.”¹³ Second, effective treatment is based on the use of combinations of drugs. If only one ingredient in the “cocktail” is protected and sold at a monopoly price, the whole regime will be too expensive for most patients. Third, generic producers need to make profits like any other business. If they cannot sell in the major national markets or are only allowed to make one or two components of a combination therapy regime, they cannot easily achieve the economies of scale to make a profit.

In addition, the pharmaceutical industry devotes very little R&D effort to diseases of the poor in developing countries, since such diseases are not high-income generators. Between 1975 and 1997, only 13 of 1,223 new chemical entities, or 1 per cent, were for the treatment of tropical diseases.¹⁴ The World Health Organization has estimated that only 4.3 per cent of pharmaceutical R&D expenditure is targeted at those health problems, such as malaria and tuberculosis, which mainly concern low- and middle-income countries.¹⁵ According to James Orbinski, former President of the International Council of Médecins Sans Frontières, while 95 per cent of active tuberculosis cases occur in developing

countries, no new drugs for the disease have been developed since 1967.¹⁶ On the other hand, a great deal of pharmaceutical research is targeted at discovering and developing treatments for health concerns of affluent societies, whether they be diet-related such as obesity and high cholesterol, trivial concerns like baldness, or chronic problems such as high blood pressure that do not involve a cure but need to be taken continually for many years. It is unlikely that the provision of stronger and better patent rights will shift research investment, or money otherwise being spent on marketing, towards malaria and tuberculosis.

What can developing countries do to reduce the costs of granting patents for pharmaceuticals?

Policy responses

What can developing countries do to reduce the costs of granting patents for pharmaceuticals? The use of a patent's subject matter under compulsory licensing is permitted under TRIPS even without prior negotiation "in the case of a national emergency or other circumstances of extreme urgency" or in cases of public non-commercial use. And TRIPS also specifies that this must be "predominantly for the supply of the domestic market". However, compulsory licensing in general is not necessarily a panacea.¹⁷ Where prior authorization from the patent owner is required (as is normally the case, except for national emergencies), negotiations can be complicated and take a long time to conclude. Second, the patent specification may not provide sufficient information to copy the drug. In fact, in the case of some drugs, the most efficient manufacturing process is protected as a trade secret or by a separate patent, which may even be owned by a different company. Third, many countries may lack chemists who can do the copying, and licensees may not necessarily be able to profitably sell the drug at a much lower price than that of the patent-holding firm. However, the very possibility of compulsory licensing tends to strengthen the bargaining position of governments and potential licensees. Also compatible with TRIPS is the ability of purchasers of drugs sold abroad to import them into a country where they are patented. Compulsory licences and provisions for government use of patented inventions should therefore be an integral part of patent legislation that is sensitive to public health concerns.

Differential pricing (that is, the application of different price levels according to countries' income levels or other indicators) has been presented by some analysts and the industry as an alternative to the use of flexibilities allowed by the TRIPS Agreement. Moreover, some companies have offered voluntarily to sell their drugs at heavily reduced prices in some markets, especially to fight HIV/AIDS. Though this is a positive development, such revised price offers are often not lower than they would be if generic competition were permitted. In some cases, drugs at reduced prices are only available to a limited number of patients. In other cases, corporations have gone further by donating drugs. But helpful as price reductions and donations may be, they do not provide a long-term solution to the problem of lack of access. Price fixing remains in the hands of the patent owners, and governments cannot control shifts in commercial policies nor decide on which medicines discounts will be offered.

While relaxing the international patent rules that restrict the manufacture and sale of generic versions of patented drugs is arguably the best possible IPR-related measure to enhance their availability to the poor, this would require agreement by the international community, which may be difficult to obtain. In the meantime, other measures may be available to widen access to treatments for diseases that affect the poor. These certainly include compulsory licensing, parallel imports and the use of "Bolar" exceptions. They also encompass tax incentives to

encourage research on diseases that most seriously affect poor people, and a global fund to pay for such research or to purchase essential drugs and supply them free of charge or at heavily discounted prices. Of course, these depend on the willingness of companies and governments to adopt such measures. Developing-country governments cannot depend on such measures, but need to take full advantage of the opportunities that may be gleaned from a careful reading of the TRIPS Agreement, including the language dealing with objectives (Article 7, see box 2.3, above), principles (Article 8), exhaustion of rights (Article 6), exceptions to rights (Article 30) and unauthorized use (Article 31).¹⁸

Apart from the expected effects of patents on prices, it is important to be aware that pharmaceutical companies often use patents to unduly delay or restrict generic competition, in some cases for several years beyond the 20-year patent duration. “Evergreening” or “line extensions” are terms used to refer to the use of IPRs for extending the monopoly, or at least the market dominance, of a drug beyond the life of the original patent protecting it. Drug companies will often try to stretch out their exclusive rights over successful drugs for as long as possible, especially when they are heavily dependent on a small number of highly profitable products (or even just one). For example, firms often apply for, and obtain patents on, new formulations or delivery methods for the drug, on reduced dosage regimens, or on new versions (e.g. polymorphs) of the active compound or combinations. Another tactic that may be possible in the case of drugs that are metabolised by the body, and thereby transformed into another substance that directly causes the therapeutic effect, is to patent this latter chemical as well.¹⁹ In addition, pharmaceutical companies, like those in other industries, use patents for a range of strategic purposes such as creating broad zones of exclusion

around their inventions, preventing other companies from exploiting their own patents, and enhancing bargaining positions in cross-licensing deals.

Companies also use trademark law to extend their market power beyond the patented drug’s expiry date.²⁰ Patented drugs are usually marketed under their brand name rather than the generic name. Since generic producers cannot use this name, it is often very difficult for them to promote their alternative product effectively. Therefore, physicians may continue to prescribe the branded product, even if it is more expensive than the generic version. In fact, in many countries physicians may not even know that alternatives exist.

It is important to point out in this context, that the global market for pharmaceuticals is increasingly competitive, albeit also highly concentrated at the level of therapeutic groups. The quantity of new chemical entities has declined in recent years,²¹ and many of the drugs entering the market are similar to existing ones in terms of their chemical structures and therapeutic effects. These are often referred to disparagingly as “me-too drugs”. In order to make big profits from these drugs, companies must be prepared to spend large sums of money on marketing. To give an idea of how much is at stake, “drugs with annual sales of some \$45 billion are set to go off-patent between 2001 and 2005”.²² Companies that are excessively dependent on one or two highly profitable drugs that are nearing the end of their patent lives, but lack the security of having a large portfolio of potential bestsellers in the pipeline, have become vulnerable to takeovers. This situation has resulted in a consolidation in the industry. Clearly, therefore, evergreening has its limits as a business strategy. It may be a panacea for a weak product pipeline, but it is certainly not a cure.

The Doha Declaration on the TRIPS Agreement and Public Health

WTO Members meeting in Doha for the November 2001 Ministerial Conference adopted a declaration (see box 6.3) intended to address the public health problems faced by the developing and least developed countries.²³ Paragraph 4 of the Declaration states that “the TRIPS Agreement does not and

should not prevent Members from taking measures to protect public health. Accordingly, while reiterating our commitment to the TRIPS Agreement, we affirm that the Agreement can and should be interpreted and implemented in a manner supportive of WTO Members’ right to protect public health and, in

The TRIPS Agreement does not and should not prevent Members from taking measures to protect public health

particular, to promote access to medicines for all.” The fifth paragraph clarifies the freedoms all WTO Members have with respect to compulsory licensing, their determination of what constitutes a national emergency or other circumstances of extreme urgency, and exhaustion of rights. Thus the Declaration reaffirms the right to use to the full the provisions in TRIPS allowing each Member “to grant compulsory licences and the freedom to determine

the grounds upon which such licenses are granted.” The Declaration explicitly mentions that public health crises “relating to HIV/AIDS, tuberculosis, malaria and other epidemics, can represent a national emergency or other circumstances of extreme urgency.” Moreover, WTO Members are free to establish their own regimes for “exhaustion of intellectual property rights”. This is important, because it means that if national laws indicate that

Box 6.3: “Declaration on the TRIPS Agreement and Public Health” (Adopted on 14 November 2001)

1. We recognize the gravity of the public health problems afflicting many developing and least-developed countries, especially those resulting from HIV/AIDS, tuberculosis, malaria and other epidemics.
2. We stress the need for the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) to be part of the wider national and international action to address these problems.
3. We recognize that intellectual property protection is important for the development of new medicines. We also recognize the concerns about its effects on prices.
4. We agree that the TRIPS Agreement does not and should not prevent Members from taking measures to protect public health. Accordingly, while reiterating our commitment to the TRIPS Agreement, we affirm that the Agreement can and should be interpreted and implemented in a manner supportive of WTO Members' right to protect public health and, in particular, to promote access to medicines for all.
5. In this connection, we reaffirm the right of WTO Members to use, to the full, the provisions in the TRIPS Agreement, which provide flexibility for this purpose. Accordingly and in the light of paragraph 4 above, while maintaining our commitments in the TRIPS Agreement, we recognize that these flexibilities include: (a) In applying the customary rules of interpretation of public international law, each provision of the TRIPS Agreement shall be read in the light of the object and purpose of the Agreement as expressed, in particular, in its objectives and principles. (b) Each Member has the right to grant compulsory licences and the freedom to determine the grounds upon which such licences are granted. (c) Each Member has the right to determine what constitutes a national emergency or other circumstances of extreme urgency, it being understood that public health crises, including those relating to HIV/AIDS, tuberculosis, malaria and other epidemics, can represent a national emergency or other circumstances of extreme urgency. (d) The effect of the provisions in the TRIPS Agreement that are relevant to the exhaustion of intellectual property rights is to leave each Member free to establish its own regime for such exhaustion without challenge, subject to the MFN and national treatment provisions of Articles 3 and 4.
6. We recognize that WTO Members with insufficient or no manufacturing capacities in the pharmaceutical sector could face difficulties in making effective use of compulsory licensing under the TRIPS Agreement. We instruct the Council for TRIPS to find an expeditious solution to this problem and to report to the General Council before the end of 2002.
7. We reaffirm the commitment of developed-country Members to provide incentives to their enterprises and institutions to promote and encourage technology transfer to least-developed country Members pursuant to Article 66.2. We also agree that the least-developed country Members will not be obliged, with respect to pharmaceutical products, to implement or apply Sections 5 and 7 of Part II of the TRIPS Agreement or to enforce rights provided for under these Sections until 1 January 2016, without prejudice to the right of least-developed country Members to seek other extensions of the transition periods as provided for in Article 66.1 of the TRIPS Agreement. We instruct the Council for TRIPS to take the necessary action to give effect to this pursuant to Article 66.1 of the TRIPS Agreement.”

patent rights over drugs are “exhausted” by their first legitimate sale, countries can then import drugs legally purchased in countries where they are sold at a lower price.²⁴

One matter that the Declaration has left unresolved is the situation where countries lacking the capacity to produce drugs will find it difficult to make effective use of compulsory licensing. Since TRIPS stipulates that unauthorized use of a patent shall be “predominantly for the supply of the domestic market”, it may not be possible to grant a compulsory licence mainly or exclusively to supply a patented

medicine to a country in need. This is an important issue because many poor countries lack the capacity to manufacture different pharmaceutical products, and would therefore need to import them from countries such as India, an important supplier of cheap generic drugs. To make the situation even more difficult, India is required by the terms of TRIPS to introduce product patents on drugs from 2005.²⁵ Paragraph 6 of the Declaration instructs the TRIPS Council “to find an expeditious solution to this problem and to report to the General Council before the end of 2002.” As it turned out, no solution could be agreed within this deadline.²⁶

Countries lacking the capacity to produce drugs will find it difficult to make effective use of compulsory licensing

CHAPTER 6: END NOTES

- ¹ See *Resource Book*, Part 2.7 on TRIPS Article 39.
- ² See, for example, UNCTAD, “The TRIPS Agreement and developing countries”, Geneva, 1996.
- ³ US Public Law 105-277 (105th Congress, 1999) established that “...none of the funds appropriated under this heading may be available for assistance for the central Government of the Republic of South Africa, until the Secretary of State reports in writing to the appropriate committees of the Congress on the steps being taken by the United States Government to work with the Government of the Republic of South Africa to negotiate the repeal, suspension, or termination of section 15 (c) of South Africa’s Medicines and Related Substances Control Amendment Act No. 90 of 1997.”
- ⁴ WHO was mandated “to report on the impact of the work of the WTO with respect to national drug policies and essential drugs and make recommendations for collaboration between WTO and WHO, as appropriate” (Resolution WHA49.14, 25 May 1996).
- ⁵ Resolutions WHA54.10 and WHA54.11.
- ⁶ The United Nations Sub-Commission for the Promotion and Protection of Human Rights also pointed out the “apparent conflicts between the intellectual property rights regime embodied in the TRIPS Agreement, on the one hand, and international human rights law, on the other”, including human rights to food, health and self-determination (Commission on Human Rights, Sub-Commission on the Promotion and Protection of Human Rights, Fifty-second session, Agenda item 4, The Realization of Economic, Social and Cultural Rights, Intellectual Property Rights and Human Rights).
- ⁷ Bermudez J, et al., “The WTO TRIPS Agreement and patent protection in Brazil: Recent changes and implications for local production and access to medicines”, *WHO/PAHO Working Paper*, 2000, available at <http://www.neglecteddiseases.org/4-4.pdf>.
- ⁸ International Intellectual Property Institute, “Patent protection and access to HIV/AIDS pharmaceuticals in Sub-Saharan Africa”, Washington, DC: 2001: 23.
- ⁹ Oxfam, “Cutting the cost of global health”, *Oxfam Parliamentary Briefing* No. 16. February 2001.
- ¹⁰ For example, Levin et al., op cit; Mansfield, E, “Patents and innovation: an empirical study”, *Management Science* 32(2), 1986: 173-181; Taylor, CT, and Silberston ZA, *The Economic Impact of the Patent System: The British Experience*, Cambridge: Cambridge University Press, 1973.
- ¹¹ See, for example, Correa C, “Public Health and intellectual property rights”, *Global Social Policy* 2(3), 2002: 261-278.
- ¹² Attaran, A and Gillespie-White L, “Do patents for antiretroviral drugs constrain access to AIDS treatment in Africa?” *Journal of the American Medical Association* 286 (15), 2001: 1886-1892.
- ¹³ Oxfam, Consumer Project on Technology, Essential Action, Oxfam, Treatment Access Campaign and Health Gap, “Comment on the Attaran/Gillespie-White and PhRMA surveys of patents on Antiretroviral drugs in Africa”, 2001, available at: <http://www.cptech.org/ip/health/africa/dopatentsmatterinafrica.html>.
- ¹⁴ Byström, M and Einarsson, P, TRIPS. “Consequences for Developing Countries: Implications for Swedish Development Cooperation”, Report commissioned by the Swedish International Development Cooperation Agency, 2001: 35. According to the UNDP, of the annual health-related research and development worldwide, only 0.2 per cent goes for pneumonia, diarrhoeal diseases and tuberculosis; yet these account for 18 per cent of the global disease burden (UNDP, *Human Development Report*, New York, Oxford University Press, 1999: 69).
- ¹⁵ World Health Organization, “Investing in Health Research and Development”. Report of the Ad Hoc Committee on Health Research Relating to Future Intervention Options, Geneva: WHO, 1996.
- ¹⁶ Orbinski, J, “Health, equity, and trade: a failure in global governance”, in Sampson, GP (ed.), *The Role of the World Trade Organization in Global Governance*, Tokyo: United Nations University, 2001: 230-231.

- ¹⁷ Reichman and Hasenzahl caution that “policymakers should view non-voluntary licensing of patented inventions as but one item in an arsenal of tools that may be used to promote national systems of innovation. What matters is not so much the use made of any particular tool, but rather the overall coherence and effectiveness of any given system. Absent a coherent strategy for promoting national and regional systems of innovation, excessive reliance on compulsory licensing of patented inventions may simply mask deeper structural problems and make them harder to solve in the long run.” (Reichman, J and Hasenzahl C, “Non-voluntary licensing of patented inventions: historical perspective, legal framework under TRIPS, and an overview of the practice in Canada and the United States of America”. Case study for the UNCTAD/ICTSD Capacity Building Project on the TRIPS Agreement and Sustainable Development, 2002.
- ¹⁸ For a detailed examination of these provisions, see UNCTAD-ICSTD, *Resource Book*.
- ¹⁹ Patenting targets chosen by companies to extend their monopolies on drugs may include the following: polymorphs (crystalline forms of the active compound); pharmaceutical forms (i.e. new ways of administering the active compound); selective inventions (elements selected from a group that were not specifically named in earlier patents claiming the group); analogy processes; combinations of known products; optical isomers; active metabolites; prodrugs (inactive compounds that produce active metabolites when introduced into the body); new salts of known substances; variants of existing manufacturing processes; and new uses for old products (see Correa, CM, “Trends in Drug Patenting: Case Studies”, Buenos Aires: Corregidor, 2001:11-12).
- ²⁰ This is not a new practice. As early as 1919, the American Pharmaceutical Association complained about this form of monopolistic “abuse”, and accused the German chemical firms. At that time the Association favoured either compulsory licensing provisions, or the abolition of product patents on medicinal chemicals that would cover any process to manufacture them (see American Pharmaceutical Association, Report of the Committee on Patents and Trademarks of the American Pharmaceutical Association, August 1919, Cited in Dutfield G, *Intellectual Property Rights and Life Science Industries: A 20th Century History*, London: Ashgate Publishing Company, July 2003.
- ²¹ From 1969 to 1989 the number of new chemical entities launched per year on the world market fell from over 90 to under 40 (Chartered Institute of Patent Agents (CIPA), Patenting in the Pharmaceutical Industry: Supplementary Protection Certificates, Briefing paper. London: CIPA, 1998).
- ²² Reuters, “AstraZeneca holds off rivals as U.S. patent on world’s top drug dies”, 6 October 2001 (<http://www.economictimes.com/today/06worl11.htm>). See also *Financial Times*, “Ancient cures in a global market”, 30 April 2002.
- ²³ For a detailed analysis of this Declaration, see Abbott, F. “Legal Options for Implementing Paragraph 6 of the Ministerial Declaration on the TRIPS Agreement and Public Health”, 2002, available at <http://www.geneva.quano.info/pdf/Legal%20Options%20Abbott.pdf>; Abbott, F, “The TRIPS Agreement, access to medicines and the WTO Doha Ministerial Conference”, Quaker United Nations Office Geneva, Occasional Paper 7, 2001; Kempf, R, “Patents versus Patients?”, *Archiv des Völkerrechts*, vol. 40, 2002: 90-134.
- ²⁴ That is, the first sale or marketing under a parallel patent, trademark or copyright abroad “exhausts” the holder’s right within that country. If exhaustion occurs when a good or service is first sold or marketed outside a country, the patent holder within the country may not oppose importation on the basis of its IPR (see *Resource Book*, op cit.).
- ²⁵ UNCTAD, “Transfer of Technology for Successful Integration into the Global Economy. A Study of the Pharmaceutical Industry in India”, Geneva and New York, UNCTAD, 2002; Omer, Assad, “Access to medicines, transfer of technology and capacity building”, in *Wisconsin International Law Journal*, Vol. 20, No. 3, Summer 2002, pp. 551-562.
- ²⁶ The Commission on Intellectual Property Rights (see box 1.2) was of the view that a solution to this problem should be based on the following principles. First, it should be quickly and easily implementable with a view to a long-term solution. Second, the solution should ensure that the needs of poor people in developing countries without manufacturing capacity are given priority. Third, it should seek to ensure that conditions are established to provide potential suppliers the necessary incentives to export medicines that are needed. (See Commission Report: 48).

7

Food, Agriculture and Biodiversity

Food, agriculture and biodiversity, as IPR-related issues, are closely related. Apart from the TRIPS-related interrelationships, they are also the subject of three very important international agreements, described in chapter 2 whose coverage overlaps to a significant degree. These are the Convention for the Protection of New Varieties of Plants (UPOV Convention), the FAO International Treaty on Plant Genetic Resources for Food and Agriculture, and the Convention on Biological Diversity (CBD).

Food security and IPRs

An adequately nutritious diet is essential for all people throughout their lives. In addition, people need to earn a living. In many developing countries, the majority of the population lives on the land, cultivating food and other crops for both subsistence and exchange. One of the main issues raised by current debates on IPRs - particularly in the context of their impact on developing countries - is the consequences that legislation protecting such rights may have for food security. The term “food security” here applies to more than just ensuring that an adequate amount of food is cultivated or available through the market. It is also concerned with the question of whether people can afford to buy or cultivate enough food to satisfy their basic nutritional requirements. If this is not the case, as in most developing countries, one can argue that food security is lacking.

What is the connection with IPRs? In the developed world, plant breeders have generally sought IP protection for new plants - including new foodstuffs - through plant breeders’ rights (PBRs). The point at issue is whether the international acceptance of common standards of PBRs through the UPOV Convention (see chapter 2 for the main features of the Convention, and box 2.4), initially developed to meet the conditions in the advanced industrialized countries, may have the effect of undermining the food security of communities in developing

countries. Some NGOs argue that this may occur in three ways:

1. by encouraging the cultivation of a narrow range of genetically-uniform crops, including non-food cash crops, with the possible consequences that people’s diets will become nutritionally poorer and crops will be more vulnerable to outbreaks of devastating diseases;
2. by limiting the freedom of farmers to acquire seeds they wish to plant without payment to breeders, and thereby impoverishing them further; and
3. by restricting the free circulation of plant genetic resources, which is generally considered essential for the development of new plant varieties.

One important consequence of TRIPS is that all WTO member countries must provide IPR protection for plant varieties, either in the form of patents, or through a *sui generis* (i.e. of its own kind) system. In principle, the *sui generis* provision allows countries to develop their own system for protecting plants (see chapter 4, above). In practice, the UPOV Convention is likely to be the most widely used model, as it is the only existing system in international IPR law that offers protection to plant varieties. But concern has been raised that the UPOV Convention was drawn up mainly by European countries, and is designed to accommodate the specific

One of the main issues raised by current debates on IPRs is the consequences that legislation protecting such rights may have for food security

characteristics of the capital-intensive, large-scale commercial agricultural systems that generally prevail there. As a result, it is often argued, the system is unsuitable for most developing countries.¹ Critics have expressed concern that the current system of IPR protection for plants could have an

adverse impact on food security in terms of: (i) PBRs and research priorities; (ii) the interests of poor farmers; (iii) the availability of genetic resources for further breeding; and (iv) genetic erosion. These concerns are discussed below.

Plant breeders' rights and research priorities

Many resource-poor farmers cultivate minor food crops that enable them to meet the nutritional needs of rural communities much better than if major crops such as wheat, rice and maize alone were to be cultivated. In the hills and valleys of Nepal, for example, villages may grow more than 150 crop species and cultivated varieties.² However, PBRs generally do not encourage breeding related to minor crops with small markets. This is because the returns on their research investment will be quite small. Rather, they encourage breeding targeted at major crops with significant commercial potential. Moreover, protected varieties of plants may not even

be food crops. In Kenya, for example, until 2000, about half the protected new varieties were foreign-bred roses cultivated for export (see box 7.1).

It is conceivable, then, that PBRs may contribute to a trend whereby traditionally diverse agro-ecosystems, containing a wide range of traditional crop varieties, are replaced with monocultures of single agrochemical-dependent varieties, with the result that the range of nutritious foods available in local markets becomes narrower. Admittedly this trend is a global phenomenon that began before the introduction of PBRs. Nevertheless, it is one that the

PBRs generally do not encourage breeding related to minor crops with small markets

Box 7.1: Plant variety protection: the case of Kenya

When Kenya's Seeds and Plant Varieties Act entered into force in 1975, it became one of the first developing countries to provide for plant breeders rights in national legislation. The Act, which is largely modelled on the UPOV Convention (and its counterpart in the United Kingdom),³ required protected varieties to be novel, sufficiently distinguishable or of a sufficiently pure variety; sufficiently uniform or homogeneous; and stable in their essential characteristics. In addition to these requirements, "the agro-ecological value [of the variety] must surpass, in one or more characteristics, that of existing varieties according to results obtained in official tests."

However, the PBR section of the Act could not be implemented until the 1990s when the Seeds and Plant Varieties (Plant Breeders' Rights) Regulations were passed (in 1994), and the Plant Breeders' Rights Office (PBRO) was established (in March 1997).

Until 2000, most of the 200 or more applications came from foreigners, and were mostly for horticultural varieties, with roses constituting about half the total. The public sector, which produces most new varieties bred in Kenya, has only recently begun to show interest in seeking protection. Its applications are now on the rise. While new firms are starting up, given the amount of time it takes to breed new varieties,⁴ it is likely to be several more years until any increased private sector breeding activity is reflected in a rise in the number of applications.

With respect to research priorities, one of the PBRO staff members warned that: "PBR introduction is likely to weaken research on crop varieties that are less economic such as traditional food crops ... The main threat lies in the anticipated displacement of some of the food security crops for cash crops/high value crops. The anticipated shift of research priorities will bring a problem in technology development and transfer for resolving food shortage problems and hence may destabilize food security."⁵ This scenario is plausible. Yet if income from the sale of higher value crops benefits the poor, the system may, nonetheless, be beneficial, on balance, even for the poor.

It is too early to say whether the system is a success or a failure, or how far the Kenyan experience could be repeated in other developing countries. At the present time, the most useful role the PBR system plays is probably that of encouraging the transfer of foreign-bred varieties to Kenya. This is necessary for those products heavily dependent on foreign breeding material, and which are cultivated largely for export. Perhaps the most important of these are cut flowers.⁶

existence of PBRs and their increasingly widespread use may indirectly encourage. On the other hand, developing countries are not prevented from encouraging research on minor crops that are impor-

tant for local communities, either by providing strengthened IPR protection for such species, or adopting other related measures.

Plant breeders' rights and the interests of poor farmers

The second issue is that in most developing countries, a large proportion of the population depends on agriculture for employment and income. Many of these farmers are small-holders for whom seed saving, across-the-fence exchange and replanting are common practices. This is especially in countries (many in Africa) where neither the public nor the private sector plays a significant role in producing or distributing seed. Although the UPOV system allows on-farm replanting, its rules restrict farmers' freedom to buy seed from sources other than the original breeders.

Seed companies argue in response that farmers do not have to purchase PBR-protected seeds just because they are available. They point out that the farmers are free to continue cultivating non-PBR-protected seeds, including traditional local varieties, if they so wish. Therefore their basic freedoms are unaffected by PBRs. While this is likely to be true, folk varieties are often disparaged and may be excluded from government-approved seed lists.⁷ Moreover, in many developing countries, government support for farmers, including credit, is sometimes conditioned on the sowing of particular crops and types of seed, such as hybrids. Also, seed aid is used by providers as a way to promote the use of particular crops and seeds.

Regardless of the arguments on both sides, it is true that the *sui generis* clause in TRIPS does give governments a certain amount of freedom to tailor their PBR systems to address such concerns. Thus, while an increasing number of developing countries are joining UPOV, some countries are devising alternative PBR systems that aim, in part, at strengthening food security. They do this, for example, by allowing farmers to acquire PBR-protected seed from any source and/or requiring protected varieties to display qualities that are genuinely superior to existing varieties.⁸

Although the seed industry generally dislikes the farmers' privilege, until recently most countries

upheld it, either explicitly or by default. However, since 1994, European Community PBRs restrict farmers' privilege to certain crops, and breeders must be remunerated through the payment of royalties unless they are small farmers, in which case they are exempted. In the United States, the rule used to be that farmers could sell protected seed as long as their "primary farming occupation is the growing of crops for sale for other than reproductive purposes". Since 1994, though, seed saving, while permitted, must be restricted to the amount necessary for on-farm replanting.

Plant breeders' rights are justified on the grounds that they encourage investment in plant breeding; the argument being that without legal protection there would be little incentive to breed new conventionally-bred varieties of plants, especially crops such as wheat and rice that usually self-pollinate, and therefore remain genetically homogeneous through several generations. This is because breeders cannot otherwise legally prevent farmers and rival companies from selling second-generation seed (except, perhaps, through contracts).

The evidence suggests that the introduction of PBRs in Europe and North America has led to increased private investment in plant breeding overall, but that this increase has been modest and targeted at a small number of crop species.⁹ However, even with PBRs, much breeding effort continues to focus on crops such as maize, that are relatively easy to hybridise, rather than on self-pollinating crops bred through the more traditional, crossing and selecting methods. This results in varieties that can be protected by PBRs. The attraction for farmers is that the first generation of hybrid seed is extremely productive. The drawbacks are that the "hybrid vigour" does not extend to harvested seed, which does not even breed true to type. Farmers must consequently buy fresh seed for each planting season. This is a major benefit for the seed companies, which is why they invest so much in hybrid breeding.

While an increasing number of developing countries are joining UPOV, some countries are devising alternative PBR systems

The Indian parliament has passed legislation that would maintain the freedom to save, sell and exchange all produce of a protected variety (box 7.2), and the Organization of African Unity has developed a model law for the consideration of member governments, known as the African Model

Legislation for the Protection of the Rights of Local Communities, Farmers and Breeders, and for the Regulation of Access to Biological Resources.¹⁰ In both cases, at least as much importance is attached to the interests of farmers as to those of breeders.

Box 7.2: The Indian Protection of Plant Varieties and Farmers' Rights Act

In response to TRIPS, the Indian Government chose the *sui generis* option by drafting the Protection of Plant Varieties and Farmers' Rights Act, which was passed by parliament in 2001. The main objectives are: (i) to stimulate investment for research and development, both in the public and the private sectors, for the development of new plant varieties, by ensuring appropriate returns on such investments; (ii) to facilitate the growth of the seed industry in the country through domestic and foreign investment which will ensure the availability of high quality seeds and planting material to Indian farmers; and (iii) to recognise the role of farmers as cultivators and conservors and the contribution of traditional, rural and tribal communities to the country's agrobiodiversity by rewarding them for their contribution through benefit sharing and protecting the traditional rights of farmers.

While sharing similarities with UPOV 1978, additional provisions are included to protect the interests of public sector breeding institutions and the farmers. For example, the bill upholds "the right of a farmer to save, use, exchange, share or sell his farm produce of a [protected] variety" except "... where the sale is for the purpose of reproduction under a commercial marketing arrangement".

The Act appears to reflect a genuine attempt to implement TRIPS in a way that supports the specific socio-economic interests of all the various producer groups in India: private sector seed companies, public corporations and research institutions, as well as resource-poor farmers. But it remains to be seen how well it will operate in practice.

The restrictions on access to breeding material may have other causes than IPRs

IPRs and the availability of genetic resources for breeding

Plant breeders and supporters of PBRs in general, tend to stress the necessity of being able to freely access genetic material including that which is IPR protected. This is why the UPOV Convention contains such a broad breeders' exemption. Patent law tends to have a much narrower research exemption, which is often limited to non-commercial scientific or experimental use. Moreover, while a PBR-protected plant variety is covered by a single title, plant-related biotechnological inventions are likely to be protected by a patent and, in some cases, several patents. The patents may cover not just plants, but also genes and DNA sequences. The effect of patents is to restrict access to the patented "products". It has been argued that "locking up" genetic resources with patents is a bad thing because innovation in plant breeding is cumulative and depends on being able to use as wide a stock of material as possible.

The FAO International Treaty introduced a number of provisions to deal with this concern (see box 7.3.) However, apart from patents, the restrictions on access to breeding material may have other causes than IPRs. For one thing, some countries have chosen to exclude certain categories of plant genetic resources, which they consider to be strategically important, from the multilateral system to be set up under the International Treaty. Also, some developing countries have been exercising their rights under the CBD to regulate access to their genetic resources, and in doing so have restricted their free flow. Fowler is of the view that this may well be detrimental to long-term food security.¹¹

But beyond these issues about how specific intellectual property rights privatise genetic material needed for breeding is the association of IPRs with

the privatisation of agricultural research, the shrinkage of non-proprietary public sector research, and the increased concentration of ownership of breeding material, research tools and technologies in the hands of a small number of giant corporations.¹² Not only does this trend reduce the free circulation of

breeding material, but it can also make public policy-making aimed at enhancing food security harder to put into practice. This is because it is much more difficult for governments to influence companies than the public institutions they partly or wholly fund.¹³

Box 7.3: The FAO International Treaty

Recognising both the sovereign rights and the interdependence of countries, the International Treaty on Plant Genetic Resources for Food and Agriculture establishes a multilateral system that aims to facilitate access and benefit-sharing (ABS). ABS is to be regulated principally by means of a standard material transfer agreement (MTA), which will apply also to transfers to third parties and to all subsequent transfers.

One of the most controversial parts of the Treaty is Article 12.3(d), which states that “recipients shall not claim any intellectual property or other rights that limit the facilitated access to the plant genetic resources for food and agriculture, or their genetic parts and components, in the form received from the Multilateral System”. Such an undertaking is to be provided in the standard MTA adopted to regulate the facilitated access. Japan and the United States both opposed this language and abstained from the vote on the adoption of the Treaty.

What exactly is the issue here? In some legal jurisdictions, it is possible to patent DNA sequences and chemical substances that have been isolated from plant material without any structural modification. Therefore a patent holder could restrict - subject to possible research exemptions - use of the protected sequence or compound by others, and even access to it if the patent covered the method of isolation. To some developed countries, allowing such patents is necessary to encourage innovation and disclosure of the “invention”. But to many developing countries (and even some developed countries), this legitimises misappropriation of resources to which they have sovereign rights, and is contrary to the spirit of an international agreement that emphasizes exchange rather than appropriation.

The Treaty does not define Farmers’ Rights. Article 9 states that national governments are responsible for realizing these rights as they see fit, and the Treaty refers to three measures that governments should take to protect and promote them: “(a) protection of traditional knowledge relevant to plant genetic resources for food and agriculture; (b) the right to equitably participate in sharing benefits arising from the utilization of plant genetic resources for food and agriculture; and (c) the right to participate in making decisions, at the national level, on matters related to the conservation and sustainable use of plant genetic resources for food and agriculture”. While none of these is necessarily IPR-related, the last paragraph of Article 9 points out that “Nothing in this Article shall be interpreted to limit any rights that farmers have to save, use, exchange and sell farm-saved seed/propagating material, subject to national law and as appropriate.”

Genetic erosion: an IPR-related issue?

It is sometimes argued that IPRs have implications for biodiversity. Concerns raised about this tend to focus on the PBR rules of the UPOV Convention that require individual plant varieties to be genetically uniform. Yet the mass cultivation of uniform varieties based on a narrow range of breeding material can result in outbreaks of devastating diseases. This happened with the potato crop in Ireland in the

1840s, and with wheat and maize in the United States in the 1960s and 1970s respectively.¹⁴ Of course, many such disease outbreaks pre-dated the introduction of PBRs in the affected countries. Despite this, critics argue that PBRs encourage the genetic uniformity that can potentially increase the dangers of such outbreaks occurring.

It is argued that IPRs have implications for biodiversity

However, concerns extend also to the agribusiness field more generally. In this context, two questions need to be addressed: do intellectual property rights encourage the spread of monocultural agriculture consisting of genetically uniform varieties? And if so, does this cause erosion of agro-biodiversity? Perhaps one of the most plausible criticisms of IPRs is that they encourage centralized research, as opposed to research tailored to local environmental and socio-economic conditions. According to one commentator, the prevailing policy framework for the use of genetic resources for food and agriculture favours “centralized crop breeding and the creation of uniform environmental conditions, and discourages agro-ecological research or local breeding tailored to local conditions”.¹⁵ IPRs enhance incentives to develop seeds that will have a large potential demand. To ensure maximum demand for their products, the seed companies will tend to focus their research on commonly utilized high-value

crops, and develop varieties that can be cultivated as widely as possible. To do so means either breeding through selection of genes for maximum adaptability, or introducing the new seeds while also promoting farming practices that reduce environmental heterogeneity. The biodiversity-erosive effects of this IPR-supported bias towards centralized crop breeding programmes are: (i) decreased crop diversity; (ii) decreased spatial genetic diversity; (iii) increased temporal genetic diversity, and (iv) increased use of external inputs.

Rangnekar has sought to push the discussion forward by taking a historical institutional analysis of the relationship between PBRs and genetic uniformity. He reaches the interesting conclusion that such IPRs *do* in fact encourage plant breeding based upon existing material already in scientific use, while providing “juridical legitimization to the breeding of genetically uniform varieties”.¹⁶

Increasing trade in agricultural produce through geographical indications

For the many developing countries that are important commercial producers of agricultural goods, food security is far from being the only agricultural issue. They are also likely to want to generate wealth through the increased commercialisation of such goods. This would enable peoples to translate their collective knowledge and long-standing practices into a form of livelihood and income, thus promoting rural development. Here, there is an obvious link to the wider efforts at protecting traditional knowledge - an issue discussed in chapter 8. Geographical indications (GIs) may provide support for such an aspiration, at least for certain products. GIs are defined in the TRIPS Agreement as “indications which identify a good as originating in the territory of a Member, or a region or locality in that territory, where a given quality, reputation, or other characteristic of the good is essentially attributable to its geographical origin”. According to Vivas,¹⁷ the GI concept embraces various elements including: (i) that GIs identify goods rather than services; (ii) that GIs do not protect ideas or procedures, but simply identify and differentiate products in the market; and (iii) that there must be a special link between the origin and the quality, reputation or special characteristics. As Rangnekar points out with respect to wider efforts at protecting traditional knowledge

and rewarding the holders of this knowledge, “GIs are considered useful because of the emphasis they place on the product-place linkage”.¹⁸ He identifies three other key features: (i) knowledge remains in the public domain; (ii) the scope of protection is limited to controlling the class and/or location of people who may use the protected indication; and (iii) the rights can potentially be held in perpetuity as long as the product-place link is maintained.¹⁹

According to TRIPS, WTO Members are required to “provide the legal means for interested parties to prevent: (a) the use of any means in the designation or presentation of a good that indicates or suggests that the good in question originates in a geographical area other than the true place of origin in a manner which misleads the public as to the geographical origin of the good; [and] (b) any use which constitutes an act of unfair competition ...”²⁰

The potential value of GIs has been overshadowed by the discussions in the TRIPS Council. The Agreement makes a distinction between GIs in general and those covering wines and spirits. The issue of the extension to other products of the additional protection provided to wines and spirits under the TRIPS Agreement for GIs has for some time been a passion-

The potential value of GIs has been overshadowed by the discussions in the TRIPS Council

ately debated topic in the WTO. The reason for this debate is that under the TRIPS Agreement, GIs for wines and spirits (Article 23) are offered a higher level of protection. In order to prevent a third party from using a GI for a wine or a spirit, the holder of that GI does not have to prove that such use would mislead the public as to the true geographical origin of the product, or that such use would constitute an act of unfair competition (as is required for the pro-

tection of GIs for other products). The holder of the GI merely needs to show that the product in question does not originate in the indicated area. The debate, as opposed to other controversial issues within TRIPS, has not been a North-South debate but one between the "new" and the "old" world.²¹ The nature of this debate - its pros and cons - are summarized in box 7.4, below.

Box 7.4: GIs Extension under the TRIPS Agreement: The Pros and Cons²²

In favour of extension	Against extension
There is no justification for the continued discrimination of other products with respect to wines and spirits	This imbalance of protection is the result of the Uruguay Round negotiations and should be seen in the wider context of trade policy.
The TRIPS Agreement in Article 24.1 authorizes Members to negotiate on GI extension. ²³	The authorization in Article 24.1 relates to wines and spirits, not to other products.
An authorization limited to wines and spirits would further aggravate the imbalance in protection.	Such limited authorization is aimed at wines and spirits that so far are subject to exceptions under Article 24.
The protection provided by Article 22 is not sufficient: free-riding on a good's reputation remains possible.	The <i>demandeurs</i> have not provided any evidence of economic losses on account of weaker protection.
Article 22 does not address the risk of GIs becoming generic.	The Article 23-protection is not absolute; expectations of economic gains may be diluted through the exceptions under Article 24.
Protection is inefficient due to the difficulties in proving that the public is misled or that there is an act of unfair competition. Article 22 gives the judge wide discretion, which may result in inconsistent decisions and legal uncertainty for rights holders of different products.	A uniform regime for GIs is against the spirit of TRIPS, which establishes only minimum standards.
GI extension will provide a higher level of protection for many reputed products of developing countries, different from wines and spirits.	GI extension is no guarantee for economic success. Benefits will also depend on marketing efforts.
GI extension would not necessarily result in higher administrative costs. It would enable increased ease of enforcement of GIs by the authorities; enforcement of Article 23 protection is similar to trademark protection, with which authorities are familiar.	Developing countries have a smaller number of GIs that could possibly benefit from extension. The burden of protecting foreign GIs would thus fall disproportionately on them. In return, there would be insufficient benefits for their own GIs, because these are often deemed generic in developed countries.
There would be benefits for consumers, who could more easily identify the true origin of a product.	Consumers would be confused, due to the disappearance of certain names, resulting in increased search and transaction costs, at least in the short or medium term.
Like other IPRs, GIs prevent free-riding. In this respect trade disruption and market closure appear justified.	Developing-country industries engaged in free and fair product imitation will suffer losses from market closures.
Affected products may still be sold, but under a different name.	Sales of identical products under a different name might reduce market possibilities.

There are challenges to be faced in realizing the potential that exists in GIs

The EU and the Swiss Government are very keen to promote GIs worldwide, claiming that this part of TRIPS can potentially provide substantial gains for developing countries (box 7.5 describes the Swiss experience with GIs). This seems plausible considering that GIs, much like trademarks, constitute a legal mechanism to identify and differentiate one set of firms' products from those of all firms in the same product category.²⁴ This dual result of identification and differentiation is because of the special characteristics commonly exhibited by a group of firms' product on account of observing a common method of production and of its being produced in the same geographical region. This potential, it should be underlined, exists not just for foods and beverages, but also handicrafts and other hand-made items.

Consequently, advocates such as the EU and Switzerland emphasize the wider rural economic development dimension of GIs. However, there are challenges to be faced in realizing the potential that exists in GIs. Indeed, it may be argued that when countries adopt such an IPR, they implicitly accept "the underlying philosophy of the distinctiveness of local and regional products", and also that "globalization of ... artisanally-based principles" inherent to geographical indications "counters the standardization of products which is normally considered the outcome of the internationalization of the agro-food industries [and] assists small family firms to resist the industrialization and corporatization of production".²⁵

Box 7.5: Protection of GIs: the Swiss experience

The Federal Law on the Protection of Trademarks and Indications of Origin of 1992 sets forth the requirements of protection for GIs. This law applies, for instance, when other protection regimes for agricultural products are not invoked. Under this law, indications of origin - which encompass direct or indirect references to the geographical origin of products or services, including references to their nature or properties having a relationship with their origin - are protected automatically, i.e. *without* prior recognition or registration. To protect competitors in a given region and consumers, the law strictly prohibits the use of: incorrect indications of origin on products, indications that might lead to confusion, and names, addresses or trademarks for goods or services that might lead to deception about the real origin. In order for protection to apply, no notification or registration is necessary.

Although registration is not a prerequisite for general GI protection, the Swiss protection system for GIs does provide for the possibility of their registration for agricultural products: the Ordinance on the Protection of Appellations of Origin and Geographical Indications in respect of Agricultural Products and Processed Agricultural Products of 28 May 1997 establishes a register for geographical names designating agricultural products. Two different kinds of GIs are defined and protected under this ordinance: the *protected appellation of origin* (PAO) and the *protected geographical indication* (PGI). For the PAO, all production steps (harvesting, processing and preparation) must occur within the designated geographical area. In the case of PGI, only one step throughout the production process is required to occur within the designated geographical area. To register a PAO or PGI, a group of producers files an application with the Federal Office of Agriculture including, among other things, a "*specification*" defining the product, a description of the method of production, and a delimitation of the geographical area. A certification body is entrusted with the control of the production, processing and preparation of the product. Once the GI is registered, all producers within the relevant geographical area, who fulfil the conditions of the specification are allowed to use the registered GI. Although no prerequisite for protection as such, the registration entry will be of help for evidence purposes in an enforcement procedure. At the end of 2002, 10 indications had been registered in Switzerland as a PAO or PGI, and 20 applications were pending. Registered GIs include cheeses, meat products, vegetables and spirits.

Investing in products traditional to their geographical origin can have beneficial effects: The promotion of GIs can be one tool for decentralizing a national economy, by linking a specific product and its production to the region from which it originates. Social and environmental benefits, such as maintaining soil cultivation, can result, since the local production and the valuation of those traditional and local products can safeguard employment in rural or remote regions of the country. Effective protection of the identity and reputation of products also allows traditional products and ways of production to be better preserved, thereby also preserving cultural diversity in a country.

Source: Swiss Federal Institute of Intellectual Property

For several developing countries, then, geographical indications would appear to have real potential for developing and exploiting lucrative markets for natural products, including those manufactured by resource-poor farming communities. It appears from case studies of GI-products in Europe that no single factor or set of factors can explain the successful commercialisation of those products. However, reviewing a selection of European case studies, Rangnekar²⁶ identifies the following factors as important: (i) coordination between all firms involved in the production process (i.e. the supply chain) so as to ensure coherence in that process and consistent quality standards; (ii) developing transparent institutional mechanisms for creating and monitoring quality codes; (iii) public policy measures to promote and protect the products in markets at all possible levels - local, national and international, as the case may be; (iv) constant monitoring of the market, in particular to ensure effective market penetration, while simultaneously protecting the

product from “generics” and possible substitutes. But they are useless without good standards of quality control and marketing, and up-to-date information on markets - including foreign ones - if the products are to be exported. At present, the potential of geographical indications for developing countries is somewhat speculative, because this type of IPR has been used only in a few countries outside Europe. It should be borne in mind that many GI-products have fairly small markets, and a relatively small number are traded internationally. Moreover, some countries are concerned that the present enthusiasm for GI-products among Europeans is, to some extent, about restricting competition in ways that may be detrimental to the trade interests of countries capable of producing goods of similar quality, both for domestic consumption and for export to Europe. In this respect, the requirements for “authenticity”, “origin” and “product specificity” become entry barriers into niche sub-markets for that class of products.

CHAPTER 7: END NOTES

- ¹ See GRAIN (Genetic Resource International) "Beyond UPOV: Examples of Developing Countries Preparing Non-UPOV Sui Generis Plant Variety Protection Schemes for Compliance with TRIPS", at www.grain.org/publications/nonupov-en-p.htm. See also UNDP et al., "Making Global Trade Work for People", London and Sterling, VA: Earthscan, 2003: chapter 11.
- ² Riley, KW, "Decentralized breeding and selection: tool to link diversity and development", in Sperling L and Loevinsohn M (eds), *Using Diversity: Enhancing and Maintaining Genetic Resources On-farm*, New Delhi: International Development Research Centre, 1996.
- ⁴ See Juma, C, "The Gene Hunters: Biotechnology and the Scramble for Seeds", Princeton: Princeton University Press, 1989: 153.
- ⁵ Chirchir, NJ, "Harmonization of plant breeders rights and policy in public research institutions in Kenya". Policy paper prepared as part of the ACTS Training Course in Policy Analysis for Africa: *Intellectual Property, Technology Transfer and the Convention on Biological Diversity*, 16 June - 26 Nov: 1997: 17.
- ⁶ Van Roozendaal, G, "Kenyan cut flower export blooming", *Biotechnology and Development Monitor* (21), 1994: 6-7.
- ⁷ See Tripp, R, "The structure of national seed systems", in Tripp R (ed.), *New Seed and Old Laws: Regulatory Reform and the Diversification of National Seed Systems*, London: Intermediate Technology Publications on behalf of the Overseas Development Institute, 1997.
- ⁸ See Dhar B, "Sui Generis Systems for Plant Variety Protection", Quaker United Nations Office, Geneva, 2002.
- ⁹ Rangnekar, D, "Access to Genetic Resources, Gene-Based Inventions and Agriculture", London: Commission on Intellectual Property Rights, 2002.
- ¹⁰ The African model's main aim is to ensure the conservation, evaluation and sustainable use of biological resources, including agricultural genetic resources, knowledge and technologies, in order to maintain and improve their diversity as a means of sustaining life supporting systems. There are altogether 11 specific obligations which cover recognition of the rights of local communities and breeders, regulation of access to biological resources, community knowledge and technologies, promotion of benefit sharing mechanisms, and various others relating to participation, community rights, capacity building, conservation and sustainable use of plant genetic resources, agricultural sustainability and food security.
- ¹¹ Fowler, C, "Sharing agriculture's genetic bounty", *Science* 297, 2002: 157.
- ¹² See Herdt, RW, "Enclosing the global plant genetic commons". Paper for presentation at the China Center for Economic Research, 24 May 1999.
- ¹³ It is true though that cash-strapped governments have to reduce their research expenditures out of necessity, and the private sector can play a useful role in taking up the slack.
- ¹⁴ Groombridge, B (ed) , "Global Biodiversity: Status of the Earth's Living Resources", London: Chapman and Hall, 1992.
- ¹⁵ Reid, WV, "Genetic resources and sustainable agriculture: creating incentives for local innovation and adaptation". *Biopolicy Series* No. 2, African Centre for Technology Studies, Nairobi, 1992.
- ¹⁶ Rangnekar, D, "Plant breeding, biodiversity loss and intellectual property rights". *Economics Discussion Paper* 00/5, Kingston upon Thames: Kingston University, Faculty of Human Sciences, 2000.
- ¹⁷ Vivas-Eugui, D, "Negotiations on geographical indications in the TRIPS Council and their effect on the WTO Agricultural negotiations", *Journal of World Intellectual Property* 4(5), 2001: 703-728.
- ¹⁸ Rangnekar, D, "The Socio-Economics of Geographical Traditions", UNCTAD-ICTSD Capacity Building Project on IPRs and Sustainable Development, Geneva, 2003 (forthcoming).
- ¹⁹ Ibid.
- ²⁰ See UNCTAD-ICTSD, *Resource Book on TRIPS and Development*, chapter 2.3.

- ²¹ For details on this issue, see Rangnekar D, “Geographical Indications. A Review of Proposals at the TRIPS Council: Extending Article 23 to Products other than Wines and Spirits”, 2002. This study has been undertaken within the framework of the present Project and is available on the Project website at http://www.ictsd.org/iprsonline/unctadictsd/docs/rangnekar_may2003_final.pdf.
- ²² See Rangnekar, 2002, op. cit.: 42 *et seq.*, referring partly to Members' submissions in the TRIPS Council.
- ²³ Article 24.1 TRIPS provides that: “Members agree to enter into negotiations aimed at increasing the protection of individual geographical indications under Article 23[...].” Opinions differ over the interpretation of the reference to Article 23. Those in favour of GI extension contend that this refers to the means of additional protection in general, whereas opponents of GI extension argue that the reference is exclusively to wines and spirits. For details, see Rangnekar, 2002, op cit.: 44-45. Irrespective of this controversy, GI extension exists as *Tiret* 87 in the WTO *Compilation of Outstanding Implementation Issues* (document at http://www.ictsd.org/ministerial/doha/docs/imp_iss.pdf).
- ²⁴ It is important to note here that while trademarks identify a single firm, geographical indications identify a group of firms.
- ²⁵ Moran, W , “Rural space as intellectual property”, *Political Geography* 12(3), 1993: 263-277.
- ²⁶ See Rangnekar, D, 2003, op. cit. (forthcoming).

8

Traditional Knowledge (TK) and Folklore¹

As stated earlier in this paper, indigenous peoples and advocacy groups have condemned the way the IPRs system has dealt with traditional knowledge.

Chapter 8 examines the evidence relating to the economic value of traditional knowledge and folklore, the issues of ownership and the modalities for protecting traditional knowledge and folklore through the IPRs system.

The economic value of TK and folklore

Attempts have been made to estimate the contribution of TK to modern industry and agriculture. For the pharmaceuticals industry, the estimated market value of plant-based medicines sold in 1990 was \$61 billion.² That many of these would have used TK in their product development is borne out by Farnsworth's estimate that of the 119 plant-based compounds used in medicines worldwide, 74 per cent had the same or related uses as the medicinal plants from which they were derived.³

There are no reliable estimates of the total contribution of traditional crop varieties (landraces) to the global economy. However, a study on the use and value of landraces for rice breeding in India

calculated that rice landraces acquired from India and overseas contributed 5.6 per cent, or \$75 million, to India's rice yields.⁴ Assuming that landraces contribute to the same extent in other countries where rice is cultivated, the global value added to rice yields by use of landraces can be estimated at \$400 million per year.

However, accurately estimating the full value of TK in monetary terms is difficult,⁵ first because TK is often an essential component in the development of other products, and secondly because most TK-derived products never enter modern markets anyway.⁶ In any case, a great deal of TK is likely to have cultural or spiritual value that cannot be quantified in any monetary sense.⁷

Estimating the full value of TK in monetary terms is difficult

Who owns TK and folklore?

The fact that TK is being widely disseminated and commercially exploited, with only a small proportion of the benefits flowing back to provider peoples and communities, raises the question of ownership. Who owns TK, according to traditional peoples and communities? And who owns TK, according to most national legal systems and the international IPR regime?

Many commentators argue that traditional peoples and communities are often characterized by a strong sharing ethos with respect to their knowledge and

resources. There is a great deal of truth in this, but this does not mean that *everything* is shared with *everybody*. The anthropological literature reveals that such concepts as ownership and property rights - or at least close equivalents to them - also exist in most, if not all, traditional societies.⁸ But to assume that there is a generic form of collective intellectual property rights ignores the intricacies and sheer diversity of traditional proprietary systems. According to a Canadian indigenous peoples' organization, the Four Directions Council: "Indigenous peoples possess their own locally-specific systems of juris-

TK that has not been kept secret is generally treated as being the intellectual property of nobody

prudence with respect to the classification of different types of knowledge, proper procedures for acquiring and sharing knowledge, and the rights and responsibilities which attach to possessing knowledge, all of which are embedded uniquely in each culture and its language.”⁹

Nonetheless, IPR regulators and courts dealing with IPR disputes have hardly heeded customary law, nor seen any reason why they should do so.¹⁰ In most countries, all TK anywhere in the world that has not been kept secret is generally treated as being the intellectual property of nobody. Therefore it can be used freely by anybody who acquires it.

However, the generalization that public domain TK cannot be the subject of IP protection should be qualified. This is because different jurisdictions vary as to whether and how far foreign prior art may be used to determine the state of the art against which the novelty of the invention should be measured. In some countries, inventions cannot be patented, for example, if prior knowledge, use or publication exists anywhere in the world. In a few countries, only domestically held knowledge use or knowledge manufacture is accepted. Elsewhere, only unpublished foreign use or knowledge cannot be taken into account in prior art searches. These different conceptions of novelty may helpfully be referred to as

absolute novelty, local novelty and mixed novelty.¹¹ According to Ozawa, local novelty operates in Egypt, Fiji, New Zealand and Panama. Mixed novelty operates in Australia, China, India, the Republic of Korea, and the United States.¹² In the latter country¹³, although an applicant is not allowed to receive a patent if “he did not himself invent the subject matter sought to be patented”,¹⁴ there are concerns that this loophole sometimes allows people to copy such undocumented foreign knowledge and claim they have come up with a new invention. The notorious patent on the use of turmeric powder for wound healing granted to the University of Mississippi Medical Center may be an example of this.¹⁵ The patent provoked considerable anger in India because such use of turmeric was common knowledge there. Yet the Indian Government agency that challenged the patent had to do more than persuade the United States Patent and Trademark Office that this was true. It had to provide published documentation. Because it was able to do so, the patent was revoked.¹⁶ Yet the patent should never have been granted in the first place.

It could be argued that many such erroneously granted patents do little harm beyond wasting the time of patent examiners. But some may well be harmful. A good example appears to be a United States patent on a field bean cultivar called “Enola”.

Box 8.1: The “Enola” bean patent

In 1999, the United States Patent and Trademark Office granted a patent on a field bean cultivar dubbed “Enola” by the “inventor”, an entrepreneur called Larry Proctor. Controversially, Proctor’s Colorado-based company Pod-Ners has been using the patent to block the sale of imported beans with the same colour as the ones described in the patent. This would include various traditional bean varieties. The patent claims not only a certain yellow-coloured *Phaseolus vulgaris* bean seed, plants produced by growing the seed as well as all other plants with the same physiological and morphological characteristics but also the breeding methods employed. Two aspects are extraordinary about this patent. The first is that many bean cultivars exist, and the specification provides no evidence that none of these cultivars possess the same characteristics falling within the patent’s rather broad claims.¹⁷ The second is that Mr Proctor employed conventional crossing and selective breeding methods that are in no way novel. This prevents others from using the bean and other beans with similar characteristics in their own breeding programmes. None of this would necessarily matter if the owner had not decided to assert the patent aggressively. Soon after receiving the patent, Proctor sued a company called Tutuli that had been importing Mexican yellow bean cultivars called mayocoba and peruano from that country since 1994, and with customs inspectors disrupting supplies Tutuli began to suffer financially, as did Mexican farmers who had been selling their beans to this firm. Proctor’s company has since filed lawsuits against various other small bean companies and farmers.¹⁸ The patent is being challenged by the International Center for Tropical Agriculture (CIAT), with headquarters in Colombia, which holds the largest collection of bean varieties, and claims that 6 of its 260 yellow bean accessions very closely resemble enola and may well fall within its claims. CIAT’s Director, Dr Joachim Voss, reportedly called the patent “both legally and morally wrong” and claimed to have “solid scientific evidence that Andean peasant farmers developed this bean first, together with Mexico.”¹⁹ The Mexican Government has also condemned the patent.

However strictly patent offices seek to apply the novelty and non-obviousness criteria, their staff in some jurisdictions are known to have insufficient time or resources to conduct thorough, prior art searches and examinations. It is noteworthy, that

the World Intellectual Property Organization (WIPO) is seeking ways to deal with this problem by improving accessibility of published TK through databases.

Protecting TK and folklore through the IPR system

The question arises as to whether IPRs such as copyright, patents and trade secrets should be used for the protection of TK, and, if so, how can this be

done? The following examines possible means of protection. (For geographical indications see discussion in chapter 7).²⁰

Copyright and performers' rights

At the international level, the idea of applying copyright law to protect unfixed cultural expressions, including those of traditional peoples and communities, dates back to the 1960s. The term commonly applied to such manifestations of culture was not TK but “folklore”, or “expressions of folklore”.²¹

The possibility of protecting folklore by means of copyright was raised in 1967 at the Diplomatic Conference of Stockholm for the revision of the Berne Convention. Although the issue was not fully resolved, the following provisions were included in the Stockholm Act of the Convention, and retained in the revision adopted in Paris in 1971:

In the case of unpublished works where the identity of the author is unknown, but where there is every ground to presume that he is a national of a country of the Union, it shall be a matter for legislation in that country to designate the competent authority which shall represent the author and shall be entitled to protect and enforce his rights in the countries of the Union (Article 15.4[a]).

Countries of the Union which make such designation under the terms of this provision shall notify the Director General [of WIPO] by means of a written declaration giving full information concerning the authority thus designated. The Director General shall at once communicate this declaration to all other countries of the Union. (15.4[b]).

Over the years, many traditional peoples and communities have condemned the unauthorized

reproduction of their fixed and unfixed cultural expressions such as artistic works, handicrafts, designs, dances, and musical and dramatic performances. Not only do outsiders frequently neglect to ask permission to do so, but also fail to acknowledge the source of the creativity, and even pass off productions and works as authentic expressions or products when they are not. Yet it is difficult to prevent such practices. Could the copyright provisions of TRIPS provide a solution?

In Australia, Aboriginal artists have, on a few occasions, successfully sued on the basis of copyright infringement.²² Copyright law is also being used by the Dene of Canada, as well as several other indigenous groups worldwide, to control use by others of compilations of their TK. In theory, then, more and more peoples and communities will be able to avail themselves of copyright protection as countries increase their compliance with the levels of enforcement required by TRIPS.

Despite these successes, copyright law has some fundamental limitations in the folklore context. First, whereas copyright requires an identifiable author, the notion of authorship is a problematic concept in many traditional societies. Second, copyright has a time limit: for folkloric expressions that are important elements of people's cultural identity, it would be more appropriate to have permanent protection. Third, copyright normally requires works to be fixed. However, among some traditional groups, folkloric expressions are not fixed, but are passed on orally from generation to generation. This

Copyright law has some fundamental limitations in the folklore context

normally excludes such expressions from eligibility for copyright protection.

Taking the first limitation - identifiable author - it is sometimes argued that IPRs, and especially copyright law, unduly emphasize the role of individuals in knowledge creation, and consequently fail to reward those knowledgeable communities and collaborators that provided the intellectual raw material that formed the true basis for the copyrighted work or patented invention.²³ In other words, creative expressions and collective innovations such as those of traditional communities are ineligible for protection, and can legally be treated as free inputs for industrial R&D and the copyright industries. According to this view, then, copyright law is more likely to be used to undermine the interests of traditional peoples and communities than to promote them. This is probably true. But this is not a reason to discount copyright completely, since it is not essential to name an author to acquire copyright protection.

Turning to the second limitation - time limits - copyrights have time limits and most people would probably agree that it is a good thing they do. But for many traditional peoples and groups, certain expressions and works are central to their cultural identity and should therefore never be fully released into the public domain, at least not to the extent that others would be free to do whatever they like with them. This is not to say that copyright protection should therefore be permanent for culturally significant expressions and works, but that copyright law should not be seen as the appropriate approach for each and every kind of cultural work.

Regarding the third limitation, copyright normally

protects fixed works. Since communities often do not have the means of recording their cultural expressions, they cannot acquire copyright protection. However, this bar to protection can be removed given the will to do so. Several countries have incorporated protection of folkloric expressions into their national copyright laws (e.g. Tunisia, 1967; Bolivia, 1968; and Kenya, 1975). Given the way copyright has been transformed to, for example, treat computer programs as literary works, it hardly seems radical to extend copyrightable subject matter to unfixed cultural expressions, or even to create a new IPR based on copyright for this purpose.²⁴ But the most powerful actors in international IPR negotiations still resist the idea of modifying international copyright rules to more effectively protect folklore.²⁵ And to date, proposals to reform TRIPS to protect TK have paid little attention to copyright.

Unfixed cultural expressions can, to a limited extent, also be protected under performers' rights in cases where performances have been fixed without the authorization of the original performers. TRIPS partially incorporates the 1961 Rome Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations, allowing performers to prevent the recording and reproduction of their performance on a phonogram, and the broadcast and public communication of a live performance.²⁶ But neither the Rome Convention nor TRIPS makes any reference to folklore. However, the 1996 WIPO Performances and Phonograms Treaty defines "performers" as "actors, singers, musicians, dancers, and other persons who act, sing, deliver, declaim, play in, interpret, or otherwise perform literary or artistic works or *expressions of folklore*".²⁷

Patents

Michael Blakeney notes that "the expression 'Traditional Knowledge' ... accommodates the concerns of those observers who criticize the narrowness of 'folklore'. However, it significantly changes the discourse. Folklore was typically discussed in copyright, or copyright-plus terms. Traditional knowledge would be broad enough to embrace traditional knowledge of plants and animals in medical treatment and as food, for example. In this circumstance

the discourse would shift from the environs of copyright to those of patent law and biodiversity rights."²⁸

But can patent law actually provide promising solutions? This question may be addressed by considering the most commonly expressed objections to the patent approach and assessing their validity. The main objections are as follows: (i) TK is collectively

held and generated, while patent law treats inventiveness as an achievement of individuals; (ii) patent applicants must supply evidence of a single act of discovery; (iii) patent specifications must be written in a technical way that examiners can understand; and (iv) applying for patents and enforcing them once they have been awarded is prohibitively expensive.

Taking the first objection, it is often asserted that because TK is collectively held and generated, patent law is fundamentally incompatible. This is because patents require that an individual inventor be identifiable. Yet while TK is merely part of the public domain, a new and non-obvious modification to this knowledge achieved by an individual or identifiable group can be the subject of a patentable invention.

This particular argument against the compatibility of IPRs is persuasive in the copyright context, but does not fit the patent situation so easily. In the late nineteenth century, large research-based corporations were already finding the heroic-inventor paradigm to be rather inconvenient. They much preferred to treat invention as a collective and organized corporate endeavour in which individual flashes of genius were unnecessary. Through their lobbying efforts, patent law and doctrine began to accommodate the collective notion of invention from as early as the 1880s, first in Germany and then elsewhere. This suggests that the collective nature of TK production and ownership need not be a bar to the acquisition of a patent. It certainly has not been for corporations.

As to the second objection - evidence of single act of discovery - while there need be no demonstrable "flash of genius", patent specifications must, nonetheless, provide evidence of an inventive step or an act that would not be obvious to one skilled in the art. Applying the same criteria to TK would exclude much, but by no means all, of it from patentability. This is not only because it is difficult to identify a specific act of creation in the area of TK, but also because such acts may have taken place in the distant past. This point should not be over-stated. Many anthropologists have demonstrated that TK in many societies is evolutionary, dynamic and adaptive.

Turning to the third objection - written specifications - it would be extremely difficult for a shaman

or indigenous group to translate their knowledge into technical language for patentability purposes. While a useful characteristic of a plant or animal may be well-known to such an individual or group, the inability to describe the phenomenon in the language of chemistry or molecular biology would make it almost impossible for them to apply for a patent even if the fees could be afforded, which is unlikely.²⁹ Here there is a role for qualified attorneys in developing countries to assist translating a shamans knowledge in a patent application.

This is a situation that a company could exploit. Patent rules in most countries require a company to do more than describe the mode of action or the active compound to acquire a patent. Minimally, it would probably need to come up with a synthetic version of the compound or a purified extract. But in the absence of a contract or specific regulation, the company would have no requirement to compensate the communities concerned.

Finally, the lack of economic self-sufficiency of many traditional communities, the unequal power relations between them and the corporate world, and the high cost of litigation, would make it very difficult for them to protect their knowledge through the patent system. The costs of preparing and prosecuting a patent application, and of periodically renewing the patent after it has been granted, are well beyond the financial means of most communities. Even though patent fees in some jurisdictions may be reduced for small and medium-sized enterprises, using the patent system is still likely to be prohibitively expensive for them.

On the face of it, the use of patent law has some genuine possibilities. Among the options that might be considered are: (a) for traditional peoples, communities or their representative organizations to apply for patents; (b) for them to share ownership with companies who would apply on their behalf; or (c) for companies to file patents, but with community members named as inventors, with contractual rights, to be compensated.

Nevertheless, most traditional peoples and communities seem to be fundamentally opposed to patents, and few if any are rushing to patent offices to submit their applications, or are likely to in the future. The main practical difficulty that deters

Traditional peoples are sceptical that patent law could be utilized to further their interests

them is the expense involved, which includes payments to the patent attorney hired to complete the application, and the filing, prosecution and renewal fees. Legally enforcing the patent against infringers is likely to be even more expensive. Moreover, patents with overly broad claims encompassing non-original products or processes are sometimes mistakenly awarded. Due to poverty, few if any indigenous groups could mount legal challenges to patents on the grounds that their knowledge or, say, landraces, have been fraudulently or erroneously claimed.

In addition, patent law tends to be formulated in ways that tend to be highly supportive of corporate interests, and the demands of traditional peoples and communities are rarely if ever taken into account when patent regulations are reformed.³⁰ Traditional peoples and communities view this as unjust. Thus they are sceptical that patent law could be utilized to further their interests. It can be argued that a democratic IP system should take into account a wider set of interests including those of TK holders.

A considerable amount of TK could be protected under trade secrecy law

Undisclosed information (trade secrets)

While the sharing of knowledge is common in many traditional societies, healers and other specialist knowledge-holders as well as clans and lineage groups are likely to have knowledge that they will not wish to share with anybody. Conceivably, a considerable amount of TK could be protected under trade secrecy law. (See also the discussion on the opportunities and challenges of protection through trade secrets in chapter 3).

whether other communities have the same knowledge. If an entry is not in the public domain, the community or communities with the knowledge are deemed to have a trade secret. The trade secret can then be disclosed to companies with benefit-sharing guaranteed by a standardized contract. These benefits would then be distributed among the trade-secret-holding communities and the Ecuadorian Government. So far the database contains 8,000 entries provided by six participating indigenous groups. So far, 60 per cent of the uses appear not to have been disclosed through publications, and already three companies have expressed interest in accessing the database.³²

An experimental project based in Ecuador and supported by the Inter-American Development Bank is currently trying to protect TK as trade secrets. The project, Transforming Traditional Knowledge into Trade Secrets, aims to enable traditional peoples and communities to benefit from bioprospecting through effective trade-secret protection of their knowledge.³¹ The NGO, Ecociencia, is documenting the botanical knowledge of the participating indigenous groups, and registering it in closed-access databases. Checks are made to see whether each entry is not already in the public domain and

Thus, as developing countries implement the TRIPS section on undisclosed information, the possibility exists for trade secrecy to be deployed as a means of protecting TK and of realizing its commercial potential for the benefit of the knowledge holders and their communities.

The protection of TK and/or folklore has become part of the work of several inter-governmental organizations

International negotiations on protection of TK and folklore

The protection of TK and/or folklore has become an integral part of the work of several inter-governmental organizations.

Since 1999, traditional knowledge has become an especially important concern for many developing countries in their negotiations on TRIPS. For example, in October 1999, a proposal for a legal framework on TK was submitted to the WTO General Council by the Governments of Bolivia, Colombia,

Ecuador, Nicaragua and Peru.³³ The document proposed that the WTO establish a mandate in a future trade round with three purposes: (a) to carry out studies, in collaboration with other relevant international organizations, in order to make recommendations on the most appropriate means of recognizing and protecting traditional knowledge as the subject matter of intellectual property rights; (b) on the basis of those recommendations, initiate negotiations with a view to establishing a multilateral legal

framework that will grant effective protection to the expressions and manifestations of traditional knowledge; (c) to complete the legal framework envisaged in paragraph (b) above in time for it to be included as part of the results of the Doha round of negotiations.

The continued interest in this issue among many developing countries is borne out by the fact that WTO Members agreed at the 2001 Doha Ministerial Conference “to examine the relationship between TRIPS and the CBD, and the protection of traditional knowledge and folklore” (see below).

In 2000, the WIPO General Assembly agreed to establish an Intergovernmental Committee (IGC) on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore. At the second meeting, held in December 2001, several developing countries proposed, without objections from other participating countries, that WIPO should produce a document providing elements for model *sui generis* protection for traditional knowledge.³⁴ The General Assembly meeting in the second half of 2003 will consider future directions for the organization’s work in the area of TK, folklore and genetic resources. According to the WIPO secretariat, there is strong support for the idea that the IGC should move towards concrete outcomes within the next two years, and focus on the international aspects of protection of TK.³⁵

As mentioned earlier (chapter 2), the CBD explicitly acknowledges the role of traditional knowledge, innovations and practices in biodiversity conservation and sustainable development, as well as the need to guarantee their protection, whether through IPRs or other means. Article 8(j) requires the parties to “respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote the wider application with the approval and involvement of the holders of such knowledge, innovations and practices, and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices.”

In terms of implementation, in May 1998, the Conference of the Parties to the CBD agreed to establish

an “ad hoc open-ended inter-sessional working group” to address the implementation of Article 8(j) and related provisions, to be composed of Parties and observers including, in particular, representatives of indigenous peoples and local communities. The Working Group had its first meeting in March 2000. Based upon its recommendations, COP-5, which took place two months later, extended the mandate of the working group and adopted a programme of work. The second meeting took place in February 2002. One specific area of difference was that of TK databases. Some governments believe they can prevent patents from being improperly awarded for “inventions” that are essentially identical to TK. Databases could help patent examiners - who must screen applications to allow only those describing novel and inventive discoveries to receive legal protection - to filter out spurious inventions. Indigenous groups in attendance proposed that databases be maintained locally and under the control of indigenous and local communities. They and other groups also opposed the registration of TK without the holders’ consent.

Another controversial issue is that of harmonizing CBD provisions on TK protection with patent law. NGOs, indigenous groups and some developing-country governments have been proposing that patent applicants be required - where applicable - to disclose the source of biological material forming the subject matter of their inventions. Some proposals have gone further than this by suggesting: (a) that applicants be required to provide evidence that national authorities regulating access to genetic resources had consented to the use of the relevant resources, and (b) that traditional community members whose knowledge was used in the development of an invention had also given their prior informed consent to the application and been guaranteed a share of any benefits arising from the patent. The Commission on Intellectual Property Rights (see box 1.2) was, in this respect, of the view that “all countries should provide in their legislation for the obligatory disclosure of information in the patent application of the geographical source of genetic resources from which the invention is derived.”

The FAO International Treaty also refers to measures that governments should take for the protection of TK relevant to plant genetic resources for food and agriculture (see box 7.3).

A controversial issue is that of harmonizing CBD provisions on TK protection with patent law

In 2000, UNCTAD began its work on TK by holding an Expert Meeting on National Experiences and Systems for the Protection of Traditional Knowledge, Innovations and Practices. The Meeting resulted in a Report that seeks to reflect the diversity of views of the experts.³⁶

The World Health Organization's involvement in TK relates to its work on traditional medicine. It also

endeavours to respond to requests from its Members to cooperate with WIPO, UNCTAD and other international organizations to support countries in improving their awareness and capacity to protect knowledge of traditional medicine and medicinal plants, and securing fair and equitable sharing of benefits derived from them.³⁷

CHAPTER 8: END NOTES

- ¹ For a more detailed treatment of this topic, see Dutfield, G, “Protecting traditional knowledge and folklore: a review of progress in diplomacy and policy formulation”. UNCTAD-ICTSD Capacity Building Project on IPRs and Sustainable Development, Geneva, 2003.
- ² Principe, P, “Economics and medicinal plants”, in Tomlinson TR and Akerele OO (eds), *Medicinal Plants: Their Role in Health and Biodiversity*, Philadelphia: University of Pennsylvania Press, 1998.
- ³ Farnsworth, N, “Screening plants for new medicines”, in Wilson, EO (ed.), *BioDiversity*, Washington DC: National Academy Press, 1988.
- ⁴ Evenson, RE, “Economic valuation of biodiversity for agriculture”, in Pan American Health Organization (ed.), *Biodiversity, Biotechnology, and Sustainable Development in Health and Agriculture: Emerging Connections*, Washington DC: PAHO 1996.
- ⁵ WHO estimates the world market for alternative medicinal therapies at \$70 bn a year, with India being among the largest primary sources for plants used for alternative medicines. An Indian official is reported to have considered India a potential world leader in the alternative medicines sector, with a target in export sales of \$2 bn by 2003 and \$4 bn by 2004. See Financial Times, “Ancient cures in a global market”, 30 April 2002: 11.
- ⁶ UNCTAD, “Systems and national experiences for protecting traditional knowledge, innovations and practices”. Background note by the UNCTAD secretariat, Geneva: UNCTAD, 2000: 6.
- ⁷ See Posey, DA (ed.), “Cultural and Spiritual Values of Biodiversity”, Nairobi and London: United Nations Environment Programme and Intermediate Technology Publications, 1999.
- ⁸ See Cleveland, DA and Murray, SC, “The world’s crop genetic resources and the rights of indigenous farmers”, *Current Anthropology* 38(4) 1997: 477-496; Griffiths, T, “Indigenous knowledge and intellectual property: a preliminary review of the anthropological literature”. Unpublished paper commissioned by Working Group on Traditional Resource Rights, Oxford, 1993.
- ⁹ Four Directions Council, “Forests, indigenous peoples and biodiversity”. Contribution of the Four Directions Council to the Secretariat of the Convention on Biological Diversity, Lethbridge: FDC, 1996.
- ¹⁰ A rare exception is a 1995 copyright case in Australia (*Milpurruru versus Indofurn Pty. Ltd.*). This case involved the unauthorized importation and sale by an Australian firm of carpets manufactured in Viet Nam, on which had been reproduced the designs of three living and five deceased Aboriginal artists. According to Blakeney this case “establishe[d] the principle that where the unauthorized reproduction of such works involved a breach of copyright, customary Aboriginal laws on the subject may be taken into account in quantifying the damage which had been suffered”. (Blakeney, M, “Communal intellectual property rights of indigenous peoples in cultural expressions”, *Journal of World Intellectual Property* 1 (6), 1998: 985-1002).
- ¹¹ See Grubb, PW, “Patents for Chemicals, Pharmaceuticals and Biotechnology”, Oxford: Clarendon Press, 1999: 54.
- ¹² Ozawa, M, “Study on Protection of Traditional Knowledge and Intellectual Property: From an Era of Preservation to the Utilization of Genetic Resources and Traditional Knowledge”, Tokyo: Institute of Intellectual Property, 2002: 46, Appendix A, <http://www19.u-page.so-net.ne.jp/qc5/michelle/eMaikoOZAWA.PDF>; <http://www19.u-page.so-net.ne.jp/qc5/michelle/AppendixA.PDF>; and <http://www19.u-page.so-net.ne.jp/qc5/michelle/AppendixB.PDF>.
- ¹³ A person shall be entitled to a patent unless:
- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent, or
- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States . . . 35 USC §102.
- ¹⁴ See 35 USC §102(f).

- ¹⁵ It is worth emphasizing the words “may be”. Many patents are granted that should not be and the problem seems largely due to the failure of the system to more efficiently enable examiners to identify novelty-destroying prior art published also in the United States (see www.bustpatents.com).
- ¹⁶ Ganguli, P, “Intellectual Property Rights: Unleashing the Knowledge Economy”, New Delhi: Tata McGraw Hill, 2001: 156.
- ¹⁷ In fact, Proctor indicated in his application for a Plant Variety Protection certificate on Enola (that was subsequently granted) that “the yellow bean, Enola variety, is most likely a landrace from the [Mexican] azufrado-type varieties”. ETC Group, ‘Proctor’s gamble’, News Release: 17 December 2001.
- ¹⁸ ETC Group “Proctor’s gamble”, News Release: 17 December 2001.
- ¹⁹ In Pratt, T, “Small yellow bean sets off international patent dispute”, *New York Times*, 20 March 2001.
- ²⁰ See also discussion in South Centre, “Protection and Promotion of Traditional Medicines: Implication for Public Health in Developing Countries”, Geneva, 2002; and QUNO, “Traditional Knowledge and Intellectual Property”, Geneva, Quaker United Nations Office, 2002.
- ²¹ For example, in 1982 the Model Provisions for National Laws on the Protection of Expressions of Folklore Against Illicit Exploitation and Other Prejudicial Actions were adopted by a committee of governmental experts jointly convened by UNESCO and WIPO.
- ²² See Blakeney, *op cit*.
- ²³ See Boyle, J, “Shamans, Software, and Spleens: Law and the Construction of the Information Society”, Cambridge and London: Harvard University Press, 1996; Jaszi, P and Woodmansee, M, “The ethical reaches of authorship”, *The South Atlantic Quarterly* 95 (4), 1996: 947-977.
- ²⁴ This is not to suggest that computer programs are unworthy of protection, but that they are hardly works of literature in the strict sense.
- ²⁵ See Reichman, JH, “The TRIPS Agreement comes of age: conflict or cooperation with the developing countries?” *Case Western Reserve Journal of International Law* 32 (3), 2000: 441-470. It may actually be quite difficult even for sympathetic Western trade negotiators to understand why folklore is so important for people in developing countries. This is because folklore in western societies is no longer an integral part of most people’s lives, and is generally considered as archaic or quaint.
- ²⁶ TRIPS Article 14.1.
- ²⁷ Article 2 [emphasis added].
- ²⁸ See Blakeney, M, “What is traditional knowledge? Why should it be protected? Who should protect it? For whom? Understanding the value chain”, WIPO Doc. WIPO/IPTK/RT/99/3, Geneva, 1999.
- ²⁹ Though it may be able to if it could describe a specific formulation, even in fairly non-technical terminology.
- ³⁰ A good example is the unwillingness of government policy makers to take seriously proposals that patent applications, where appropriate, should provide evidence of prior informed consent of indigenous peoples whose knowledge has been used by the applicants for their inventions. The EU rejected such a proposal when drawing up the 1998 Directive on the Legal Protection of Biotechnological Inventions.
- ³¹ See Vogel, JH, “Bioprospecting and the justification for a cartel”, *Bulletin of the Working Group on Traditional Resource Rights* (4), 1997: 16-17.
- ³² Information provided by Dr Rocio Alarcon of Ecociencia at a seminar at Oxford University, 7 Feb. 2001.
- ³³ WTO, WT/GC/W/362, 1999.
- ³⁴ This was presented and discussed at IGC-3 in June 2002. Deliberations on this matter and related ones continued at IGC-4 in December 2002 (see WIPO, *Elements of a sui generis system for the protection of traditional knowledge*, document prepared by the Secretariat, WIPO/GRTKF/IC/3/8, Geneva, 2002).
- ³⁵ See WIPO Public Information Update (201/2003) of 21 July 2003.

³⁶ UNCTAD, “Report of the Expert Meeting on National Experiences and Systems for the Protection of Traditional Knowledge, Innovations and Practices”, Geneva: UNCTAD (TD/B/COM.1/33; TD/B/COM.1/EM.13/3) 2000.

³⁷ See also South Centre, 2002, *op.cit.*

9

Access to Knowledge, Educational, Technical and Scientific Information

This final chapter focuses on copyright-related challenges faced by developing countries with respect to new developments that might have an impact on access to knowledge and information.

Background

From the perspective of a major industrialized country, a report of the Royal Society Working Group on Intellectual Property of April 2003, endorsed by the Council of the Royal Society (United Kingdom), reached the following conclusion:

“Advances of technology and commercial forces have led to new IP legislation and case law that unreasonably and unnecessarily restrict freedom to access and to use information. This restriction of the commons in the main IP areas of patents, copyright and database right has changed the balance of rights and hampers scientific endeavour. In the interests of society, the balance must be rectified.”¹

The challenges faced by developing countries with respect to access to knowledge has been

summarized by UNESCO in the following terms:

“The creation and ownership of knowledge products are of increasing importance because of the centrality of information and knowledge to post-industrial economies. ... Copyright has emerged as one of the most important means of regulating the international flow of ideas and knowledge-based products, and will be a central instrument for the knowledge industries of the twenty-first century. Those who control copyright have a significant advantage in the emerging, knowledge-based global economy. The fact is that copyright ownership is largely in the hands of the major industrialized nations and of the major multimedia corporations, placing low per capita income countries as well as smaller economies at a significant disadvantage.”²

Copyright has emerged as one of the most important means of regulating the international flow of ideas and knowledge-based products

Importance of access to foreign works

For developing countries whose knowledge systems are dependent upon foreign publications, price is obviously a very important determinant of access. Academic journals published by the large transnational publishing houses tend to be very expensive. The Commission on IPRs (see box 1.2), in its report (page 102), concluded in this regard that there must be scope for the use of more differential pricing in developing countries, that would either be revenue-neutral or even revenue-enhancing for producing industries.

Moreover, educational, research and scientific materials cover a much wider range of goods, such as electronic databases comprising digital journals and teaching and research software. The users may be tempted to encourage or turn a blind eye to the copying of such texts. This creates a difficult dilemma for developing countries. Should they clamp down on copyright infringers, but allow prices of texts to be prohibitively high for most students, educational and scientific institutions? Or should they allow copying with impunity, and risk being

Copyright law seeks to strike a balance between the rights of the owners and the rights of users

threatened with trade sanctions by the governments of the copyright-owning publishing companies if they fail to enforce copyright?

The Berne Convention for the Protection of Literary and Artistic Works offers some support for developing countries in this regard. The 1971 Paris Act of the Convention contains an Appendix which provides - subject to just compensation to the right owner - "for the possibility of granting non-exclusive and non-transferable compulsory licensing in respect of: (i) translation for the purpose of teaching, scholarship or research; and (ii) reproduction for use in connection with systematic instructional activities,

of works protected under the Convention."³ However, the Annex's provisions are complicated, laden with restrictions and qualifications, and therefore difficult to put into practice. Consequently, it has only rarely been used.⁴ Indeed, only eight developing countries are currently availing themselves of the two options. Another country has adopted option (ii) alone. Clearly other solutions must be found. The Report of the Commission on Intellectual Property Rights characterizes the experience so far as not effective: "Further reforms are therefore needed, and different measures may be more or less important in meeting the specific needs in individual countries." (Commission Report: 100)

The issue of "fair use"

Copyright law seeks to strike a balance between the rights of the owners and the rights of users by allowing, within certain limits, unauthorized reproduction or communication of protected works. This

is called "private use" (EU and other civil law jurisdictions), or "fair use" (United States), or "fair dealing" (United Kingdom and other Commonwealth jurisdictions) (see box 9.1).

Box 9.1: "Fair use" or "fair dealing"

"Fair use" (or "fair dealing") provisions establish exceptions to copyright, authorizing third parties to use protected works on certain conditions. Such exceptions mirror the public objectives of copyright, i.e. to make creations and information widely available to the public. Fair use is permitted in international copyright instruments such as the Berne Convention and the WIPO Copyright Treaties of 1996 (so called "Internet treaties"), but States remain free to decide on whether to implement fair-use provisions in their domestic legislation.⁵ The scope and flexibility of these exceptions vary widely between countries, but generally have to meet the following requirements when applied to the right of reproduction:⁶

- Copying may only be done for *private, non-commercial* purposes, and only a *small amount* of copies may be made.
- Hard copy works may typically only be copied by reprographic processes. Possibilities exist with respect to the copying of electronic works (e.g. time-shifting of TV programmes or archiving of computer software).
- In case of exemptions to the benefit of archives or libraries, such institutions must be open to the public and their copies used for non-commercial purposes only.

Trends in international copyright treaties as well as in national legislation show increasing efforts on the part of developed countries to reduce or exclude the possibility of fair use. This is done, in particular, with respect to the circumvention of technological measures used by authors to prevent the unauthorized copying of their works ("encryption"). In this context, the WIPO Copyright Treaty (WCT) (see also chapters 2 and 4) in Article 11 obligates parties to

make available adequate legal protection and effective legal remedies if the copying is not authorized by the author, or if it is not permitted by domestic law. This means that parties to the WCT may choose to make fair-use provisions entirely dependent on the permission of the copyright holder, or not to include them at all. On the other hand, it also means that parties are free to uphold fair-use provisions for public policy purposes *even against the will of the*

author.⁷ By contrast, the United States 1998 Digital Millennium Copyright Act (DMCA) makes illegal any act circumventing encryption technologies, even in cases traditionally considered legal under the "fair-use" exception. This kind of approach to encryption is by no means made mandatory either by the TRIPS Agreement or by the WCT. Developing countries are free to deny protection to encryption technologies when these are used to prevent certain public policy goals, such as distance learning. However, the adoption of "WCT-plus" provisions, modelled after the United States DMCA are being promoted through bilateral agreements.

Developing countries should be aware of the types of exceptions covered by the DMCA. These include non-profit libraries, law enforcement, intelligence and other government activities, reverse engineering to make software inter-operable, encryption research, technology used to prevent minors from access, measures used to protect identifiable information, and security testing. Some might consider that these types of measures should fall under the general fair-use exception, whereas others consider that they should be explicitly spelled out to assure legal certainty to users.

Options for developing countries

One option for developing countries is to encourage educational, research and scientific usage of copyright material by relying on the exceptions within national copyright laws. However, there are concerns that, as part of the tendency towards strengthened copyright protection, such excepted uses will be one of the casualties.

The concept of excepted uses is being restricted, and may be restricted further. It may be argued that, for example, a blanket copyright policy in relation to non-commercial purposes falls foul of the three-step test set out in Article 13 of TRIPS (see box 9.2). All limitations or exceptions must comply with this test, and the foremost rule is that limitations or exceptions to exclusive rights under the copyright regime can only be granted in "certain special cases". Usage for non-commercial purposes may be too widespread to count as a "certain special case". However, as noted earlier, under the Berne Convention, which is integrated into the TRIPS Agreement by reference, developing countries are authorized, on certain conditions, to issue compulsory licenses for the reproduction of copyrighted material "for use in connection with systematic instructional activities"⁸; but, as also noted, this facility has rarely been used. In addition, domestic legislation that *conditioned* the unauthorized printing of schoolbooks and other teaching materials on the respect of the criteria referred to under the Berne Appendix would actually be confined to "certain special cases" within the meaning of Article 13 of the TRIPS Agreement.

Box 9.2: Article 13 of TRIPS

Members shall confine limitations or exceptions to exclusive rights:

- to certain special cases
- which do not conflict with a normal exploitation of the work
- and do not unreasonably prejudice the legitimate interests of the right holder

The second requirement under TRIPS Article 13 is that the exception does not "conflict with a normal exploitation of the work". Such exploitation is inhibited where the copyright holder loses an opportunity of extracting economic value from his copyright in the market. As far as teaching or research materials in developing countries are concerned, teaching institutions, students and researchers usually do not have the financial means to purchase such material. Therefore, from the copyright holder's perspective, there is no lost market opportunity in case of unauthorized use.

Finally, the third condition under Article 13 requires that the exception should not "unreasonably prejudice the legitimate interests of the right holder." Here, it could be argued that a right holder who wishes to prevent the free distribution of copies of his work for non-commercial purposes lacks any legitimacy for doing so. While in the case of non-commercial use, right holders do not run the risk of economic losses, they would, by preventing the free

The concept of excepted uses is being restricted, and may be restricted further

distribution of their works, deprive societies in poor countries of the benefit of new knowledge.⁹

One may also argue that Article 10(2) of the Berne Convention (which is incorporated into the TRIPS Agreement), also provides authorization to permit reproductions for educational purposes, as the provision stipulates that:

It shall be a matter for legislation in the countries of the [Berne] Union, and for special agreements existing or to be concluded between them, to permit the utilization, to the extent justified by the purpose, of literary or artistic works by way of illustration in publications, broadcasts or sound or visual recordings for teaching, provided such utilization is compatible with fair practice.

However, the wording of the provision is ambiguous. For example, is there a limit on the amount that may be copied from any given work? What do the words “to the extent justified by the purpose” mean? It is arguable that there is no necessity to copy a whole work in order to convey the information required for the teaching purpose. On the other hand, the phrase does not preclude copying the whole work in appropriate circumstances. Ricketson suggests that Article 10.2 also permits the preparation for teaching purposes of compilations antholo-

gising all or parts of a variety of works.¹⁰ The term “provided such utilization is compatible with fair practice” also suggests the need to refer back to the three-step test.

The fair-dealing or fair-use defence is usually limited to the person actually engaged in study or research, and does not extend to the person or firm facilitating these activities for others. Thus, copy shops which enable such educational usage cannot avail themselves of such a defence.¹¹ The reservation of the defence for a private individual, however, does not take into account the commonplace and economically dictated practice of multiple copying within educational institutions and copy shops caused by the high ratio of students to library resources, and the wider selection of reading material today as opposed to 30 years ago.

Public policy in both developing and developed countries tends to favour public access to works for educational and research usage. In developed countries, a balance has been reached by allowing complete reliance on the private-use/fair-dealing exceptions, but only in conjunction with some sort of payment of a licensing fee. Thus works are freely available for copying, but local collecting societies, representing authors and/or publishers, negotiate with user groups and collect a fee.¹²

Collective management

Collective management is in the interest of both authors and those users who find themselves faced with increasingly lengthy, costly search, which often proves incomplete. Collecting societies or rights management organizations have become an essential practical and economic ingredient within the copyright regime. If usage of technical and scientific information is to be compensated for, the most common approach is for a collective agreement between the rights owners and the main users of the works (i.e. the relevant public authorities). A blanket licence obliterates the need to determine whether the usage in question is inside or outside the fair-use or fair-dealing exceptions. For users, it is more expedient to be directed to one entity, which manages the rights in relation to a specific category of work, thus saving them incurring trans-

actional costs in terms of search and negotiation in obtaining licences from different authors in respect of different works. Collective management and blanket licensing are the common means by which reprographic copying in the educational sector is controlled.

In this context, the Commission on Intellectual Property Rights (see box 1.2) cautioned developing countries on the resort to collecting societies. Its Report suggested that collective management organizations can potentially wield significant market power, and may act in an anti-competitive manner, particularly in countries with weak institutional capacities and regulatory frameworks. It thus concluded that :

The Commission on Intellectual Property Rights cautioned developing countries on the resort to collecting societies

“it would seem imperative that the full costs of establishment and operation of such agencies in developing countries are demonstrated transparently from the outset and that these are borne by copyright holders as the direct beneficiaries.”¹³

The burden of administration and proof should thus be placed on rights owners rather than users. That there is a high transactional cost involved in collective management is clear from the evidence tendered by Denise Nicholson, Copyright Services Librarian at the University of Witwatersrand, South Africa to the study by the Commission on Intellectual Property Rights.¹⁴ She highlighted the following problems, which are likely to be experienced by universities, not only in the developing world but also in the developed world:

1. Getting copyright clearance may impose a heavy administrative burden;
2. Obtaining permission directly from publishers for works excluded from or not mandated to the rights organization is time-consuming, expensive (payable in foreign currency) and difficult;
3. Translating from one language to another causes problems. In some developing countries many languages may be spoken, and permission normally has to be sought for all translations;
4. Public domain material, such as government documents, are not easily accessible, and often are required to be reproduced from published versions of the documents, which involves having to get copyright clearance and paying high copyright fees;
5. Obtaining permission to transfer print into other formats (e.g. onto compact discs or websites) creates problems, as publishers are reluctant to give permission or they charge exorbitant fees; indeed, medical lecturers, for example, wishing to use anatomical diagrams

from websites or wanting to scan them into other formats, cannot do this without going through the whole process of getting permission, which is often not given or levied with high copyright costs. In many instances, rural medical personnel do not have access to such learning tools as computers, and their only sources of information are materials prepared and provided by medical institutions and academic teaching hospitals;

6. Using material from multimedia or online resources for educational and other programmes creates problems, as users do not always know where to obtain permission. Often no response is received or strict conditions are applied and high levies are charged for use of the material; and
7. Copyright fees for electronic databases are usually incorporated in the subscription fee. However, each database has its own contract and conditions as to what can and cannot be copied, which makes it difficult for users and library staff to know how to respond.

One means of resolving the problem of mandate, as indicated in point 2, is through the extended collective licence scheme adopted in the Scandinavian countries, where an agreement between a collecting society and a user will cover all works within the same field, regardless of whether the authors of the works are members of the collecting society. This protects the copyright user from having to pursue individual authors.

The alternative licensing programme is the one found in most European countries, where a “tax” is imposed on all copying machines (including scanners) and accessories (such as blank tapes, paper and disks). This would have the effect of directly targeting, and taxing, the manufacturers of such devices, as opposed to placing the whole burden of usage of materials on educational users.¹⁵

Database protection

The above testifies to the further problems which will ensue if and when the international community follows the EU example of adopting *sui generis* protection of databases. Under the EU's *sui generis* regime, introduced in 1996, database creators have the right to prevent extraction of the whole, or a substantial part, of the contents of a database for a period of 15 years, although this term of protection is renewable whenever substantial changes are made (e.g. by adding new data). Where publishers release digital versions of journals, as part of a larger database, the user may have to contend with the database right, which is independent of copyright. That right will inevitably reside with the publisher, and the author will not necessarily have an implied licence with which to use the work.¹⁶

As to the choice between copyright law or a *sui generis* system for the protection of databases, it is true that strengthened rights under a *sui generis* approach might encourage increased production of these works. However, it is important to consider that a *sui generis* right extends to material that is not protected by copyright law.¹⁷ Consequently, what has been considered a deliberate "leak" in the

copyright system - one intended to give second-generation innovators "raw materials" to work with - will be plugged by a database protection model like that of the EU. The potentially high costs to the public of obtaining information under this type of system, and the effects on competition, must be balanced with the goal of protecting databases. Like other forms of proprietary interests, a database protection system should attempt to balance the competing interests at stake to ensure that economic welfare goals are maximized.¹⁸

The Royal Society in its report on this matter concluded:

*"New database right legislation, initiated in Europe and introduced in the UK in 1998, has been driven by media and commercial interests and is potentially very damaging to scientific research. It rewards the creator of the database rather than the creator of the data, through in science the latter is the more costly contribution. Unlike copyright, database rights effectively protect the data themselves, which cannot be extracted and re-used except under restricted fair dealing arrangements."*¹⁹

Technological devices and challenges

Information technology provides both opportunities and threats for the copyright industries, including the publishing industry, which is the main supplier of educational and technical knowledge content. It sometimes appears, though, that these industries would prefer to emphasize the threats when lobbying governments to reform the law to accommodate technological changes. It has been argued that technological developments make it difficult for both authors and publishers to control the dissemination and use of works, and to enforce their exclusive rights. In fact, technology can be employed to assist rights owners in tracking their works, in facilitating collection and distribution of monies payable to authors, and in supporting the educational sector by, for example facilitating clearance for the use of both paper and electronic material; providing bibliographic material on journals that includes not only ISBN numbers and names of publishers, but also the names of the authors of individual articles; providing

online sales of extracts or individual chapters of books, or journal articles rather than whole books, or whole series of titles; and offering a site licence for certain books or chapters to be placed online on closed or locked university websites.²⁰ Technological developments also enable the digitisation of copyright works and facilitate access to many works which hitherto may have been unavailable to many consumers.

The irony is that the legal structure for authors to support the use of technology is available. Changes, as also discussed in chapter 4 above, in both international and European copyright laws have already vested in authors not only a new "Internet" right but also an "anti-circumvention" right, which assists the rights holder in "locking" or encrypting digital products so as to prevent unauthorized reproduction or use of a copyright work. Nevertheless, the industry has yet to respond in a meaningful fashion. Rapid

A sui generis right extends to material that is not protected by copyright law

development and experimentation in Electronic Copyright Management Systems (ECMS) may eventually result in greater individual management by authors or universities on their behalf. Thus universities in developing countries, for example, may, in the future, be able to deal directly with their peers from other universities, rather than through commercial publications. Technology may eventually remove the need for collecting societies, which begs the question: is collective administration of the reprographic reproduction right in respect of educational usage the only practical means for rights owners to safeguard their rights?²¹ Although online databases such as Westlaw and Medline are currently offering such services in respect of journals and certain books, and this policy could be extended to all books, especially those aimed at the academic market, the main problem which remains is that of cost.

Scientific research and technological advancement are dependent upon the free exchange of knowledge across national boundaries. However, such knowledge is increasingly being locked up by IPR-related considerations. It is also being restricted by regulations to enhance national competitiveness in

the developed countries and by lack of access of developing-country scientists and engineers to the most advanced educational institutions and scientific publications. In response to this, Barton has proposed an international treaty to preserve the scientific and technological commons:

“The key legal provision of such a treaty would require that, in as many ways as possible, foreign scientists and firms be treated the same way as national ones with respect to access to a nation’s scientific and technological support and capability. Specific provisions might include reciprocal commitments to ensure that the benefits of publicly funded research are made available to all and not just to nationals. Similar reciprocal commitments would prohibit favouritism to national firms in areas like participation in research consortia and access to research-oriented tax benefits. These would have to be balanced by safeguard provisions, to ensure, for example, that intellectual property associated with international scientific and technological collaboration is managed in a fair way, and to respond appropriately to national security and technology proliferation concerns, as with respect to military uses of biotechnology.”²²

Scientific research and technological advancement are dependent upon the free exchange of knowledge across national boundaries

CHAPTER 9: END NOTES

- ¹ The Royal Society (April 2003), "Keeping science open: the effects of intellectual property policy on the conduct of science", page v, www.royalsoc.ac.uk.
- ² See UNESCO, "World Information Report 1997/98", Paris: UNESCO, 1998: 320 at: http://www.unesco.org/webworld/com_inf_reports/wirenglish/chap23.pdf.
- ³ WIPO, "Intellectual Property Reading Material", Geneva: WIPO, 1998: 260-261.
- ⁴ Correa, CM, "Intellectual Property Rights, the WTO and Developing Countries: The TRIPS Agreement and Policy Options", London, New York and Penang: Zed Books and Third World Network, 2000.
- ⁵ See, for example, Article 9(2) of the Berne Convention: "It shall be a matter for legislation in the countries of the Union to permit the reproduction of such works in certain special cases, provided that such reproduction does not conflict with a normal exploitation of the work and does not unreasonably prejudice the legitimate interest of the author."
- ⁶ See the Report of the Commission on Intellectual Property Rights: 100, box 5.1.
- ⁷ See the *Resource Book on TRIPS and Development*, Part Two, section 2.1 on Article 10.1 of TRIPS.
- ⁸ See Article III (2) (a) (ii) of the Appendix to the Berne Convention. For more details see the *Resource Book on TRIPS and Development*, Part Two, section 2.1.6 on Article 13 TRIPS (limitations and exceptions).
- ⁹ See the *Resource Book*, *ibid.*
- ¹⁰ Ricketson, S, "The Berne Convention for the Protection of Literary and Artistic Works 1886-1986", London: Kluwer, 1987: 499.
- ¹¹ *American Geophysical Union v Texaco, Inc.* 60 F.3d 913 (2nd Cir. 1995), where the court adopted an extremely narrow application of the fair-use principle to hold a research scientist guilty of copyright infringement for making single photocopies of eight scientific articles from various issues of a scholarly journal.
- ¹² There are three types of fees: compulsory licence fee; voluntary collective licensing fee; and equipment levy.
- ¹³ Commission on Intellectual Property Rights, "Integrating Intellectual Property Rights and Development Policy". Report of the Commission, London, September 2002: 98-99.
- ¹⁴ Story, A, "Study on Intellectual Property Rights, the Internet, and Copyright", London: Commission on Intellectual Property Rights, 2002.
- ¹⁵ Cornish, WR, "Intellectual Property: Patents, Copyright, Trade Marks and Allied Rights" (fourth edition), London: Sweet and Maxwell, 1999, para 13.20.
- ¹⁶ Directive 96/9/E.C. of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases.
- ¹⁷ For more details on the difference between the copyright approach and the *sui generis* approach as provided in the EU's Database Directive, see the *Resource Book*, Part 2.1.3 on Article 10.2 of TRIPS (sub-section 6.3).
- ¹⁸ See the *Resource Book*, Part 2.1.3 on Article 10.2 of TRIPS (sub-section 7).
- ¹⁹ The Royal Society, *op.cit.*, page v.
- ²⁰ Koskinen-Olsson, T and Gervais, D, "Electronic commerce and copyright: a key role for WIPO", in *WIPO Advisory Committee on Management of Copyright and Related Rights in Global Information Networks*, Geneva: WIPO, 1999 (Document No. APMC/2/1).
- ²¹ Article 8 of the WIPO Copyright Treaty 1996; Article 3, Directive 2001/29/EC of the European Parliament and of the Council of 22 May 2001 on the harmonization of certain aspects of copyright and related rights in the information society.

²² Presentation made on 11 April 2003 at the Palais des Nations, Geneva, in the context of the Science and Technology Diplomacy Initiative and the UNCTAD-ICTSD Project on IPRs and Sustainable Development: Policy Dialogue on a Proposal for an International Science and Technology Treaty. Full text available at: http://www.ictsd.org/dlogue/docs/tech_transfer_dialogue.pdf.

ANNEX A: KEY ISSUES AND SALIENT FEATURES OF THE TRIPS AGREEMENT

Scope (Art. 1)	Copyright and related rights; trademarks; geographical indications; industrial designs; patents; layout designs of integrated circuits; undisclosed information.
General obligations/basic principles	
National treatment (Art. 3)	Requires all Members to treat nationals of other countries no less favourably than their own nationals on all matters concerning IPRs, subject to certain exceptions already provided in conventions/treaties related to IPRs.
Most-favoured-nation treatment (Art. 4)	Advantages, privileges granted by a Member to the nationals of any other country should be extended unconditionally to the nationals of all other Members.
Exhaustion of intellectual property rights (Art. 6)	For the purposes of dispute settlement, nothing in the Agreement shall be used to address the issue of exhaustion of IPRs, provided there is compliance with national treatment and most-favoured-nation treatment.
Basic objectives and principles (Arts. 7 & 8)	The protection and enforcement of IPRs should contribute to the promotion of technological innovation and to the transfer and dissemination of technology. They should also contribute to the mutual advantage of producers and users of technological knowledge, and in a manner conducive to social and economic welfare and to a balance of rights and obligations. The Agreement allows members to adopt measures necessary to protect public health and nutrition, and to promote the public interest in sectors of vital importance to their socioeconomic and technological development. At the same time, appropriate measures can be taken in order to prevent the abuse of IPRs or the resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology.
Standards	
Copyright and related rights <i>Relation to the Berne Convention (Art. 9)</i>	All members are required to comply with the substantive provisions of the Bern Convention, except for the obligation on moral rights. Eligible works must be protected on the basis of their expression as a literary work, not on the basis of ideas, procedures, methods of operation or mathematical concepts as such.
<i>Protection of computer programs and compilation of data (Art. 10)</i>	Computer programs are protected as literary works. Compilations of data are also protected under the Agreement.
<i>Rental rights (Art. 11)</i>	Concerning computer programmes, Members shall provide to authors the rights to authorise or to prohibit the commercial rentals of their works to the public. As for cinematographic works, this obligation exists only if commercial rental has led to widespread copying which is materially impairing the reproduction rights.

<i>Protection of performers, producers of phonograms & broadcasting organizations (Art. 14)</i>	Specific provisions are introduced for the protection of performers, producers and broadcasting organisations, and the term of protection is extended (at least 50 years for performers and producers, 20 years for broadcasting organisations) (as compared to the Rome Convention).
Trademarks	
<i>Protection of service marks (Arts. 15 & 16)</i>	Provides equal treatment to trade and service marks. Under certain circumstances also provides protection against use of dissimilar goods and services. No cancellation for reason of non-use (if use required to maintain a registration).
<i>Protection of well-known marks (Art. 16)</i>	Well-known marks must be protected, even when not used in a country. In determining whether a trademark is well known, the knowledge of the trademark in the relevant sector of the public is to be taken into account (Art. 16.2).
<i>Elimination of restrictions on use of trademarks (Art. 20)</i>	Use of trademarks is not to be encumbered by special requirements, such as use with another trademark.
Geographical indications	
<i>Geographical names (Art. 22)</i>	Provides means to prevent use of geographical direct or indirect names from misleading the public as to the true origin of the good, or which constitutes an act of unfair competition.
<i>Additional protection (Arts. 23 & 24)</i>	With regard to wines and spirits, protection must be provided even where there is no threat of the public being misled as to the true origin of the good. Negotiations are being undertaken with respect to the establishment of a multilateral system of notification and registration for wines.
Industrial designs	
<i>Term of protection (Arts. 25 & 26)</i>	For industrial designs, a protection of at least 10 years is required. Special provisions on textile designs leave each Member to decide whether to provide protection through copyright law or industrial design law.
Patents	
<i>Scope of protection (Art. 27)</i>	Protection should be available for any inventions, whether products of processes, in all fields of technology. Inventions that threaten public order or morality need not be patented, provided the commercialisation of such inventions is also prohibited. Most biotechnological inventions must also be protected, but plants and animals and essentially biological processes for the production of plants and animals (excluding micro-organisms and micro-biological processes) may be exempted from patent protection.
<i>Non-discrimination (Art. 27.1)</i>	The Agreement requires non-discrimination in the granting of patents and the enjoyment of rights, in relation to technology, the place of invention and whether patented products are imported or locally produced.
<i>Term of protection (Art. 33)</i>	The duration of protection must not be less than 20 years from the date of filing the application.

<p><i>Other uses without authorization of the patentholder (Art. 31)</i></p>	<p>In principle, no restrictions are placed on granting compulsory licences and government use of patents. However, these practices must respect a number of conditions to prevent patent-holders' rights being undermined. Authorization of such use should be considered on its individual merits. The detailed conditions for granting these authorizations are listed in the Agreement.</p>
<p><i>Process patents (burden of proof) (Art. 34)</i></p>	<p>Reversal of the burden of proof in civil proceedings relating to infringements of process patents is to be established in certain cases.</p>
<p><i>Plant varieties (Art. 27)</i></p>	<p>Plant varieties, including seeds, must be protected through patents or alternative sui generis means.</p>
<p>Layout designs of integrated circuits (Arts. 35-37)</p>	<p>Substantive provisions of the Washington Treaty must be respected along with a number of additional obligations; protection includes not only the protected chip, but also articles incorporating it; and the term of protection must be 10 years. An "innocent infringer" must be free from liability, but once he/she has received notice of infringement, he/she is liable to pay a reasonable royalty.</p>
<p>Undisclosed information and test data (Art. 39)</p> <p><i>Protection of trade secrets</i></p> <p><i>Protection of test data</i></p>	<p>Undisclosed information (or trade secrets) must be protected against acquisition, use or disclosure in a manner contrary to honest commercial practices. To benefit from such protection, information must be secret, have commercial value owing to such secrecy, and have been subject to reasonable steps to keep it secret.</p> <p>Test data provided by a company in order to gain marketing approval for pharmaceutical and agricultural chemical products must be protected against unfair commercial use; they must also be protected against disclosure, except where necessary to protect the public, or unless steps are taken to ensure that the data are protected against unfair commercial use.</p>
<p>Anti-competitive practices in contractual licences (Art. 40)</p> <p><i>Licensing practices</i></p> <p><i>Consultations among members</i></p>	<p>The Agreement recognizes that countries may specify in their domestic legislation the commercial licensing practices that constitute an abuse of intellectual property protection, and take steps to address these through appropriate measures.</p> <p>Members must cooperate with each other, including through the provision of information, in investigations of alleged abuse of intellectual property rights that have international dimensions.</p>
<p>Enforcement</p>	
<p>General obligations (Art. 41)</p>	<p>Members must provide effective means of action for any right holder, foreign or domestic, to secure the enforcement of his/her rights, while at the same time preventing abuse of the procedures.</p>

Procedures (Arts. 43-50)	The Agreement specifies procedures for civil and judicial action, including means to produce relevant evidence. Civil remedies that must be available should include injunctions, damages and destruction of infringing goods, or disposal of these outside the channels of commerce. Provisional measures must be available to prevent infringing activity and to preserve relevant evidence. Judicial authorities must have the authority to adopt provisional measures.
Customs cooperation	Right holders must have the means to obtain the cooperation of the customs authorities in preventing imports of pirated copyright goods and counterfeit trademark goods.
Criminal procedures (Art. 61)	Criminal procedures and penalties must be available in case of wilful trademark-counterfeiting or copyright piracy on a commercial scale.
Indemnification of the defendant (Art. 48)	Compensation for the abuse of enforcement measures are specified, including payment of defendants' expenses, which include appropriate attorney's fees.
Acquisition and maintenance of IPRs (Art. 62)	Procedures or formalities for obtaining intellectual property rights should be fair, reasonably expeditious, not unnecessarily complicated or costly, and generally sufficient to avoid impairment of the value of other commitments.
Dispute settlement (Arts 63 & 64)	The new WTO dispute settlement procedures will apply to the TRIPS Agreement.
Faster procedures	Dispute settlement procedures will be faster than in the GATT because of time limits set for each stage of the process. There is no scope for interested parties to block the process of the adoption of recommendations of panels.
Transitional arrangements (Art. 65)	One-year transitional period for all countries to apply the Agreement.
Developing countries	Developing countries can delay application of the Agreement for another four years, except for national treatment and MFN obligations. These countries are entitled to an additional five-year period for introducing product patents in areas of technology (pharmaceuticals and agricultural chemicals) that are not protected at the date of application of the Agreement. This 10-year delay in the implementation of these provisions should be seen in conjunction with Art. 70.8 of the Agreement, which provides, in respect of pharmaceutical and agricultural chemical products, the following arrangements: any Member who does not make available, as of 1 January 1995, patent protection for the pharmaceutical and agricultural chemical inventions must accept the filing of applications for patents for such inventions (establishment of a 'mailbox' for patent applications claiming such product patents), and must do so from 1 January 1995, even if it is a country which may delay the application of the Agreement, as indicated above. Once the Agreement becomes applicable in that country, it must take a decision in respect of the application (either reject it or grant a patent), but, in doing so, it must apply (retroactively) the criteria of patentability as laid down in the Agreement. If its decision is

	to grant a patent, that patent will be available for the remainder of the term (Art. 70, para. 8). However, an “exclusive marketing right” (for a period of five years) must be granted concerning the invention which is the subject matter of the application if, after 1 January 1995, in another country a patent application has been filed and a patent granted for that product and marketing approval obtained in such other Member (Art. 70, para. 9).
Least developed countries	Least developed countries are entitled to delay application of the Agreement, except for national treatment and MFN until 1 January 2006.
Technical cooperation (Art. 67)	The Agreement calls upon developed country Members to provide technical and financial assistance in favour of developing country Members on mutually agreed terms and conditions.

Source: UNCTAD, 1996:8-11