

Intellectual Property Rights and Development: Strategies for Developing Countries†

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This paper analyses the consequences of stronger Intellectual Property Rights (IPR) regimes in developing countries, especially those with low technology activity. The literature espouses various benefits of stronger IPR regimes. Though these debates are appropriate there are issues with regard to implementation of copyrights and related rights; patents; agriculture and genetic resources; and traditional knowledge, folklore and geographical indications in countries which are still not highly developed. The present ground realities leave no option for the developing countries but to adopt some level of IPR protection. Keeping in view their current levels of socio-economic development and political compulsions these levels may vary. The paper presents strategies for developing countries in the field of IPRs.

Introduction

Intellectual Property Rights (IPRs) became economically and politically very important for developing countries after the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPs) was concluded during the Uruguay Round of negotiations in 1994. This Agreement incorporated IPRs into the multilateral trading system. Since then their relationship with a wide range of public policy issues has elicited great concern over their pervasive role in people's lives and in society in general. They are frequently mentioned in discussions and debates on topics as diverse as education, health, trade, industrial policy, traditional knowledge, IT and media industries. In a knowledge-based economy, an understanding of IPRs is indispensable to informed policy making in all areas of human development.

Intellectual Property refers to the creation of human intellect. These could be ideas or expressions or devices. As per the Convention establishing the World Intellectual Property Organization (WIPO), 'intellectual property' shall include the rights relating to:

- Literary, artistic and scientific works;
- Performances of performing artists, phonograms, and broadcasts;
- Inventions in all fields of human endeavour;
- Scientific discoveries; industrial designs;
- Trademarks, service marks, and commercial names and designations;
- Protection against unfair competition; and all other rights resulting from intellectual activity in the industrial, scientific, literary or artistic fields. (World Intellectual Property Rights Treaties, n.d.)

Rationale of Protection

Like movable and immovable properties, intellectual property is also the result of effort by one or more human beings, with or without using equipments or machines.

Therefore, like the producers of the two other forms of property, the creators of Intellectual Property also have the right to insist on payment for the product of their labor or for the labor itself (James, 2006). Remuneration for creators of Intellectual Property became economically significant when cheap, multiple copies of a work could be made and it made sense for the creator to be rewarded for his/her intellectual effort and be protected from potential free riders.

History of IP Law

The concept of Intellectual Property goes back to very ancient times. Authors complained about the theft of their works in the Greek and Roman times (Stewart, 1989). Potter's marks were recognized more than 2000 years ago in Rome as distinguishing marks of the producer (Torremans, 2001). Legal protection for intellectual property goes back to the Middle Ages. In the fifteenth century, Venice had a law protecting patents (Torremans, 2001). In 1449, a patent was granted for the glass making process in England. After the invention of printing with movable typefaces by Gutenberg, many countries of Europe, including England, introduced legal restrictions on printing, which led to the emergence of modern copyright legislation. The Statute of Anne of 1709 is known as the mother of all copyright laws. In modern jurisprudence the emergence of international harmonized laws on Intellectual Property can be traced to the Paris Convention for the Protection of Industrial Property and the Berne Convention for the Protection of Literary and Artistic Works of 1886 (James, 2006).

TRIPS Agreement

The Agreement on Trade Related Aspects of Intellectual Property Rights of 1994 made protection of IP an enforceable obligation of the member states of the World Trade Organization. The objective of the Agreement was to reduce distortions and impediments to international trade, and to ensure that, while effective and adequate protection of intellectual property rights is needed,

measures and procedures to enforce intellectual property rights do not themselves become barriers to legitimate trade (Preamble). It encompassed within its purview standards concerning the availability, scope and use of Copyrights and Related Rights, Trademarks, Geographical Indications, Industrial Designs Patents, layout designs of Integrated Circuits, protection of undisclosed information and control of Anti-Competitive practices in Contractual Licenses.

This paper focuses only on copyrights and related rights, geographical indications and patents from the above regimes and agriculture and genetic resources and traditional knowledge and folklore which are as yet not considered within the ambit of this regime but are currently of great importance and are affected by IPR issues and need protection.

IPR regimes affect different countries in varied ways. The focus of the paper is on countries with low technology activity. The classification of the countries has been drawn from the UNCTAD-ICTDS Project on IPRs and Sustainable Development (Lall, 2003), which has divided various countries into groups based on their *technological activity, industrial performance and technology imports*. The low technological activity group is the third tier of countries and comprises 58 very diverse countries. The Project assumed that these countries are likely to have both significant costs and potential long-term benefits from stricter patents, depending on the level of domestic technological capabilities and their reliance on formal technology inflows. Those that are building their innovation systems on the basis of local firms copying foreign technology and importing technologies at arm's length would gain less than those with a strong transnational corporation (TNC) presence. This group has large countries with heavy industrial sectors like China, India and Egypt, along with dynamic export oriented economies like Thailand and Indonesia and some countries with small industrial sectors and weak industrial exporters.

Consequences of IPR Protection for Developing Countries

A review of the literature presents the following consequences of IPR protection for developing countries. However most of this literature reflects the views of the developed world:

1. Innovations: According to the ICTSD – UNCTAD Project on IPRs and Sustainable Development (Lall, 2003) there is stimulation of private innovation with stronger IPR regimes. The importance of this rises with the pace of technical change and with the 'imitability' of new technology, particularly in such activities as software. It also grows with globalization, which leads innovators to gear their R&D to the world rather than national markets. This leads to increases in the use of the new knowledge in productive activity, leads to higher incomes, employment, and competitiveness for the economy as a whole. This

is a step to the dissemination of new knowledge to other agents and increases local diffusion by providing an enforceable legal framework. This is likely to be of special significance for technology-intensive products and activities, where innovators are averse to selling technology to countries with weak IPRs, where leakage is a real possibility. Finally there is the stimulation of innovation by other enterprises based on information or on seeing the application of the innovation.

2. The needs of developing countries: Chen and Puttitanun (2005) have found that developed and developing countries have different technological needs. If protection of IPRs is absent, developed countries would lack the incentives to develop the technology largely needed by the developing countries. Further, firms from developed countries may react to the lack of IPRs in the developing countries by making their technologies more difficult to imitate, which can result in lower research productivity and in less efficient research, technology and less innovation. Also even if greater protection of IPRs does not directly benefit the developing countries, it could still increase world welfare, therefore there are gains from international cooperation that tightens IPRs in developing countries.

3. Socio-economic consequences: Finger and Schuler (2004) have stated that the lack of enforcement of IPRs in the domestic economy orients activity towards foreign markets, where such protection is available, or towards the high end of the home market. Here the artist is protected from the unauthorized copying by the uniqueness of his or her skill and appreciation of his or her customers for the objects that skill can render. This can move capital and skill out of the country. Another consequence of weak IPR regime is increase in piracy and counterfeiting. These cost the national governments heavily in tax revenues, as they are mostly clandestine businesses and mostly conducted in the informal/black markets.

4. Trade: Governments all over the world compete fiercely to attract foreign direct investment, hoping that multinational corporations will bring new technologies, management skills, and marketing know-how. The data available indicate that investors in sectors relying heavily on protection of intellectual property (like pharmaceuticals) are deterred by a weak IPR regime in a potential host country. There is also some evidence that weak IPR protection may discourage all investors, not just those in the sensitive sectors. Second, the lack of IPR protection deters investors from undertaking local production and encourages them to focus on distribution of imported products. This effect is present in all sectors, and is not limited to only those sectors that rely heavily on IPR protection (Javorik, 2005). Long term benefits would accrue to developing countries like a strong foundation for sophisticated business structures; economies without advanced technological capabilities may by strengthening enforcement, stimulate global innovation adding to effective demand for new products; and stronger

enforcement will stimulate greater technology transfer (Maskus, 2000).

5. Security and Safety: The World Intellectual Property Organization (n.d. (a)) estimates an alarming increase in piracy and counterfeiting activities due to weak IPR protection and an escalating harm to national economies. On a global scale, these activities are estimated to represent between 5% and 7% of world trade. Many experts predict the problems of piracy and counterfeiting will become worse as the pace of globalization quickens. Advances in new technologies allow almost exact reproductions of original products, and the internationalization of economies and the worldwide demands for certain products and brands have also resulted in a globalization of fake products. Over the years a number of incidents have been reported where counterfeit or pirated products have caused major accidents (WIPO, 2004).

6. Crime: According to INTERPOL, Intellectual Property Crime (IPC) represents one aspect of the informal economy (black market) which operates parallel to the formal economy. This is a consequence of weak IPR protection in many countries. IPC includes the manufacturing, transporting, storing and sale of counterfeit or pirated goods and is generally organized and controlled by criminals or criminal organizations due to the relatively low level of risk and comparatively high level of profit. Most terrorist groups benefit indirectly from funds remitted to them from sympathizers and militants involved in IPC. Intellectual property theft is likely to become a more important source of financing for terrorist groups because it is low risk/high return (Noble, 2003)

Developing Countries and Controversies on IPRs

At present the major controversies in the role of Intellectual Property Rights in developing countries are in the field of Copyrights, Patents, Agriculture and Genetic Resources, and Traditional Knowledge, Folklore and Geographical Indications. This paper focuses on issues and strategies in these areas.

Copyrights and Related Rights

Copyright aims at providing protection to authors (writers, artists, music composers, etc.) on their creations or “works” including computer software. There are ‘fair use’ provisions in the laws but the owner of copyright is given the exclusive right to make copies, issue copies, perform or show the work in public or translate the work. These rights are inherent rights and do not need any registration.

Copyright is drawing special attention not only because millions of poor people still lack access to books and other copyrighted works, but because the last decade has seen rapid advances in information and communication technologies, transforming the production, dissemination

and storage of information (CIPR, 2002). Access to the Internet in developing countries is still limited, although growing rapidly in most countries. The Internet provides an unrivalled means of low cost access to knowledge and information required by developing countries, when their access to books and journals is severely restricted by lack of resources. Higher IPR protection can have potentially damaging consequences for poor people. For instance, the cost of software is a major problem for developing countries, and the reason for the high level of illicit copying and access to certain works at a fraction of the price of the original. Copyright can also be a barrier to the further development of software that is specifically adapted to local needs and requirements.

It is true that there are examples of developing countries, which have benefited from copyright protection like the Indian software and film industry, but most developing countries, particularly smaller ones, are overwhelmingly importers of copyrighted materials, and the main beneficiaries of stricter IPR regimes are therefore foreign rights holders. The operation of the copyright system as a whole may impose more costs than benefits for the developing countries (CIPR, 2002). The “fair use” provisions have generally not proved adequate to meet the needs of developing countries, particularly in the field of education. For example South African health care lecturers who want to distribute non-governmental printed materials (on a non-profit basis) to their students about HIV and sex education must often pay copyright royalty charges to large multinational publishing companies for this ‘privilege’. How can it be right to charge burdensome ‘first world’ copyright royalty charges to students or teachers in South Africa who want to read and teach about this condition and how to limit its further spread (Story, 2002)?

Patents

A patent is an exclusive right granted for an invention, which is a product or a process that provides, in general, a new way of doing something, or offers a new technical solution to a problem. A patent owner has the right to decide who may — or may not — use the patented invention for the period in which the invention is protected. The patent owner licenses or sells the right to the invention to someone else (WIPO, n.d.(b)).

A number of studies have been conducted to assess the impact of patent protection in developing countries. The main reasons expounded by the developed countries for stricter patent regimes have been that patent protection helps in promoting innovation, encourages companies from developed countries to start production and R&D activities in developing countries, thus helping in FDI and technology transfer and thereby helping in their economic and technological development and it protects the country from pressure during bilateral agreements. However, the evidence of these benefits has been ambiguous. Edwin Mansfield in his study conducted on 100 industries found that in 12 types of industries patent

protection was not essential, in 3 industries (petroleum, machinery, and fabricated metal products) essential for the development and introduction of about 10-20% of their inventions. Only in 2 industries, pharmaceuticals and chemicals, were patents judged essential for 80% of the innovations (Shiva, 1997). Mansfield, Schwartz and Wagner (1981) demonstrated the above through their study on 100 industries. They found that about 60% of the patented innovations in their sample were imitated within four years. Further a patent frequently does not result in a 17-year monopoly over the relevant innovation. Patents do tend to increase imitation costs, within the drug industry, but excluding drugs, patent protection did not seem essential for the development and introduction of at least three-fourths of the patented innovations studied by them. Thus the claim of patent requirement for all industries does not stand. Further, Schneider (2004), in the study of international trade, economic growth and IPRs of developed and developing countries, found that IPRs have a stronger impact on domestic innovation for developed countries and might even negatively impact innovation in developing countries. These results suggest that most innovation in developing countries may actually be imitation or adaptive in nature. Therefore, providing stronger IPRs protects foreign firms at the expense of local firms.

Carlos Correa (2002) has pointed out that developing countries account for only 4% of the world R&D expenditure. As a result these countries are strongly dependent on the transfer of technology from developed countries. The effect of stronger patent laws may be manifested in terms of the prices of the goods and technologies. For example, medicines sold in India are up to 3,010 percent, cheaper than the same pharmaceutical drugs sold in developed countries (Mathews, 2002). It does not mean that patents will not stimulate R&D in developing countries, particularly in those that are more advanced in the industrialization process. It only means that the development of new invention will be out of reach for most countries. Though the provision of compulsory licensing on public health grounds is present in the TRIPs agreement (Mathews, 2002), the changes in intellectual property rights regimes may affect the bargaining positions of potential contracting parties and make access to technology more problematic as developed countries may force economically weaker countries to pay more.

Agriculture and Genetic Resources

The TRIPs agreement requires that countries provide some level of IP protection to plant varieties, either patents or other kinds of protection, called *sui generis*¹. They must also allow microorganisms to be patentable. The *sui generis* systems of plant variety protection (PVP) have not been particularly effective at stimulating research on crops in general, and particularly for the kind of crops grown by poor farmers. (Shiva, 1997; Srinivasan, 2003). Systems of PVP designed for the needs of commercial

agriculture in the developed countries (such as provided for in the UPOV Convention) also pose a threat to the practices of many farmers in developing countries of reusing, exchanging and informally selling seeds, and may not be appropriate in developing countries without significant commercial agriculture.

The question is whether to use patents for protecting plant varieties. Patents are commonly used in developed countries both to protect plant varieties, and to protect genetic material incorporated in plants. Because they offer a stronger form of protection than most PVP systems they may offer a stronger incentive to research, particularly in developed countries, and the multinational agrochemical companies regard them as important. However, patents also pose a threat to farmers' traditional practices of reuse and exchange. Moreover, the proliferation of genetic patents owned by different companies has led to costly disputes, and difficulties in pursuing research without infringing other companies' patents. There is evidence that patents are one factor contributing to the rapid concentration in the agricultural biotechnology field, with adverse effects on the degree of competition (CIPR, 2002). Industrial patents allow others to use a product, but deny them the right to make it. Since seed makes itself, a strong utility patent for seed implies that a farmer purchasing patented seed would have the right to use (to grow) the seed, but not to make it (to save and replant). The farmer who saves and replants the seeds of a patented or protected plant variety will be violating the law (Shiva, 1997). Shiva has further argued that patents, unlike plant breeders' rights, are very broad based and allow monopoly rights over individual genes and even characteristics. Patents allow for multiple claims that may cover not only whole plants but plant parts and processes as well. An example of this was the patent granted in USA to a biotechnology company, Sungene, for a sunflower variety with very high oleic acid content. Sungene notified sunflower breeders that the development of any variety high in oleic acid would be considered an infringement of its patent.

Another threat to further research arises from the private sector research giants who have consolidated their positions through IP driven mergers and acquisitions. For example, the merger between Ciba Geigy and Sandoz to form Novartis has allowed Novartis to emerge as an industry leader in agbiotech. Likewise, the Zeneca group strengthened its IP portfolio through its acquisition of Mogen in 1997. These groups have also engaged in significant litigations to protect their rights (Thomas, 2005). These litigations have led to the formation of "patent thickets" which Shapiro (as cited in Thomas, 2005) defines as "a dense web of overlapping intellectual property rights that a company must hack its way through in order to actually commercialize new technology".

Traditional Knowledge, Folklore and Geographical Indications

Traditional knowledge refers to tradition-based innovations and creations resulting from intellectual

activity in the industrial, scientific, literary or artistic fields. Traditional knowledge at the moment is not covered independently under any law, however, various cases of patents are being granted to mostly medicinal plants, whose healing capabilities have been known to communities for years. This has raised the issue of their protection. In developing countries, up to 80% of the population depends on traditional medicines to meet their healthcare needs. In addition, knowledge of the healing properties of plants has been the source of many modern medicines. The cases of Turmeric, Neem, Hoodia and Ayahuasca are illustrative cases (CIPR, 2002). More important is the remuneration to the community, which holds this knowledge. Pharmaceutical companies after obtaining patents are selling the same drugs to the developing countries at high prices.

There have also been cases of folklore (music, art, culture) being pirated from communities and sold by groups in the developed countries. The example of Germany rock group Enigma's unauthorized use of Taiwanese traditional musical work without their knowledge is an illustrative example. IP protection comes only when the knowledge is fixed, and this raises an issue that needs to be addressed by developing countries (Story, 2002).

One more aspect of this regime is Geographical Indications that identify the origins of a product as a mark of quality and provenance. These are region specific like Basmati Rice, Darjeeling Tea and Andaman Pepper. The economic consequences of Geographical Indications for a developing country are difficult to assess. The main economic benefit of geographical indications would be to act as a quality mark, which will play a part in enhancing export markets and revenues. CIPR (2002) has also suggested that geographical indications may be of particular interest to a number of developing countries who might have, or might be able to achieve, a comparative advantage in agricultural products and processed foods and beverages.

Ground Realities for Consideration of Developing Countries

Before any strategies for adopting IPR regimes are suggested for developing countries a few factors must be kept in mind. First, the TRIPs Agreement is a reality and the countries have to comply with its stipulations. Second, the TRIPs Agreement does not advocate a 'one size fit all' regime. It has a staggered schedule for countries according to their level of development. Third, the multinational companies who had lobbied for the inclusion of IPRs in the TRIPs were expecting immediate results from the negotiations. The staggered schedule has resulted in developed countries beginning on a bilateral basis to suggest that developing countries should adopt the standards of TRIPs earlier than later. Fourth, IPR protection in some fields is essential for the socio-economic development of the countries themselves. It is important that the countries protect their innovations and bio-resources. It is also imperative to stop piracy and

counterfeiting activities to control IP crime and also to collect revenue for works produced in the formal markets. Fifth, in the short term stricter IPR laws will lead to higher prices for imported products and new technologies, loss of economic activity by the closure of imitative activity, and possible abuse of protection by right holder like raising prices (Lall, 2003). Finally, weak IPRs played a vital role in the technological development of Korea and Taiwan, two leading Asian Tigers. They are the best recent examples of the use of copying and reverse engineering to build competitive and innovative technology-intensive industrial sectors. They used the opportunities offered effectively because of investments in skill development, strong export orientation, ample inflows of foreign capital goods, and strong government incentives for R&D. Most of the Transnational Corporation assemblies in Taiwan and Korea were isolated into export promotion units, which were not affected by the IPR regimes there. In recent years Korea and Taiwan have also moved to strong IPR regimes, partly under pressure from trading partners but also because the enterprises in these countries have now reached the technological stage where they need greater protection (Lall, 2003). Another interesting example has been illustrated by You and Katayama (2005) who found that the patent and trademark registration system does not necessarily function effectively in China. On the contrary, a subsystem such as patent and trademark registration could be providing a means of local imitation and in this way could be facilitating technology transfer/diffusion. For a product to be patented, detailed production information relating to it is required to be made public. By utilizing such information, imitators could successfully reproduce the product with relatively few resources. At the same time, a product registered for trademark is considered a profitable product, hence the risk of its being imitated increases.

Strategies for Developing Countries

Developing countries are far from homogeneous and the determinants of IPR policies will vary accordingly between countries. Policies required in countries with a relatively advanced technological capability where most poor people happen to live, for instance India or China, may well differ from those in other countries with weak capabilities. The impact of IP policies on poor people will also vary according to socio-economic circumstances.

Copyright and Related Rights

Developing countries vary in the level of the status of their copyright industries. This is reflected on one hand in the success of the Indian software industry and on the other hand in the countries like Benin and Chad who, although they have been members of the Berne Convention for decades and have not seen significant increases in their national copyright-based industries or in the level of copyright-protected works being created by their people. The availability of copyright protection

may be a necessary but not a sufficient condition for the development of viable domestic industries in the publishing, entertainment and software sectors in developing countries. Many other factors are important for the sustained development of such copyright-based industries. Taking the publishing industry in Africa as an example, factors such as the unpredictability of textbook purchasing by governments and donors, weak management skills in local firms, high costs for printing equipment and paper, and poor access to finance are likely to continue to act as very severe constraints in many countries. Moreover, given the small market size of many developing countries, the availability of copyright protection may be most significant from a commercial standpoint in export markets rather than domestically, notwithstanding the fact that authors and companies from developing countries may face insurmountable costs when action to enforce their rights in such markets is required. In larger developing countries like India, China, Brazil or Egypt, copyright protection in the domestic market is clearly of considerable importance to national publishing, film, and music and software industries (CIPR, 2002).

In knowledge-based economies the emerging need for growth in developing countries will be access to knowledge. The high cost of access to knowledge, whether in the form of books, software, or on the Internet, is an impediment to knowledge-based growth. It is therefore important that these countries adopt policies whereby access to knowledge is made available to their masses through libraries, universities and other educational institutions by giving those exemptions under national copyright laws. A reasonable number of copies of materials should be allowed under the fair use provisions for educational and public health needs. Publishers from developed countries should be addressed to provide books and software at lower rates. As an incentive, the countries should offer protection from piracy. In case of software, open source software should be encouraged to increase the access to and use of computers. National copyright laws should allow reverse engineering in the initial phase to enable local need specific software to be developed. In the field of music, art and cinematographic films, countries should encourage their creators to form collective management societies to protect interests not only in the national but also international field. However, it may be cautioned here that in countries with a small base of domestic copyright industries, the collective management societies might actually be collecting more revenue for the foreign copyright holders than the domestic ones (CIPR, 2002).

In the field of databases, WIPO is pressuring the countries to sign the WIPO Copyright Treaty, which is TRIPS plus in its protection. A report by the Commission on Intellectual Property Rights (2002) concluded that the developing countries should not sign the treaty in its present form, as it will not be in their interests. The Commission has propounded the following reasons.

First, the WIPO Copyright Treaty clarifies copyright holders' exclusive rights over material in the on-line environment and specifically calls for countries to provide effective legal remedies against the circumvention of technological protection measures restricting types of access that are not authorized by the copyright holder or permitted in national law. An important concern here is that developing countries will come under pressure, for instance in the context of bilateral agreements with developed countries, to accede to the WIPO Copyright treaty, or even to adopt stricter prohibitions against circumvention of technological protection systems and thereby reducing the scope of traditional "fair use" in digital media. Second, certain quarters of the "content" industries are calling for governments to enact legislation that require manufacturers of computer technology to build-in devices to prevent unauthorized copying of digital works. Third, specifically in relation to scientific or technical electronic databases, it is possible that developing countries will be encouraged to adopt a special regime of IP protection, in addition to the limited protection already provided under TRIPS and the Berne convention. A strengthening of IP protection for databases at the international level, whilst encouraging more investment in new commercial database products and services, may at the same time greatly reduce the access of scientists and researchers in developing countries to the data they contain because they will often lack the financial means to pay for the necessary subscriptions.

Patents

It is very important for developing countries to define what can be patented, facilitate competition, include safeguards against abuse of patents and encourage local innovation. Patents affect developing countries in two main areas – patents for biotechnology and pharmaceuticals. The question of whether the patents are to be provided for biotechnology has to be carefully decided and it should be made sure that patents when granted are only for uses set out in the patent and should not be transferable to other uses which at that time maybe be undiscovered. For example, where patents are granted over genes for a specific purpose they should not be transferable to other purposes later on. While allowing patents developing countries should also make sure that they do not hinder further research. Following examples illustrate instances of patents blocking research. Geneticist Mary-Claire King's research on cancer led to the identification of a correlation between breast cancer and a tract of DNA, which was named "BRCA1" or the "breast cancer gene" in 1990. In 1994, Myriad Genetics, a biotechnology firm based in Salt Lake City, applied for and got a patent on the breast cancer gene. Myriad used the patent for developing a test, not for finding a cure. Since then, Myriad has been given eight patents for cancer genes. For Myriad, this means a US\$150-200 million market in the United States alone. For the 40,000 women who die of breast cancer annually, there is no cure from the breast cancer

gene patent. In fact, even the screening has become less accessible as public laboratories, such as the University of Pennsylvania Genetics Diagnostics Laboratory, are forced to pay royalties. Similarly, blocking new research through patents on genes is hindering new cures for HIV/AIDS. The CCR 5 gene has been identified as coding for a receptor, and can be helpful in developing a cellular “block” against HIV/AIDS, which has infected more than 40 million people. However, a Maryland biotech company called Human Genome Science (HGS) has patented CCR 5, without knowing its functions (Shiva, 2004)². Any use of it would be its infringement.

As far as issues of public health are concerned developing countries can adopt strategies like Brazil or India. Brazil has taken the lead in developing domestic capacity to produce HIV/ AIDS drugs at low cost. The government relied on two particular articles of its 1997 industrial property law to advance the fulfillment of its national health objectives. It authorized compulsory licenses in the case of national health emergencies which allows it to authorize local producers to produce generic drugs needed to fight a national health emergency or to import from a generic producer elsewhere, despite patent protection. While Brazil has not actually used this law to issue a compulsory license, it has frequently used the threat of a compulsory license to facilitate fairer negotiations with pharmaceutical companies regarding the terms of licensing to Brazilian companies and the prices of drugs in Brazil (Wade, 2003). Indian Patent law of 1970 allowed for only process patents on pharmaceuticals. This led to build up of indigenous capacity, self –reliance in medicine and the ability of the government to control the prices and keep them low (Shiva, 2004).

Developing countries should also encourage civil society to take up issues of public health in the international fora. The death toll in Africa from HIV/ AIDS created one of the greatest international public health crises in history. By bringing details of this crisis before mass Western public, NGOs forced companies and governments to respond with various initiatives, including a dialogue in the Council for TRIPS concerning the impact of TRIPS on the sovereign capacity of States to pass public health measures to meet the crisis (Drahos, 2002).

Developing countries have to keep in mind the issues of the benefit or the loss to their population when patents are granted to diagnostic, therapeutic and surgical methods for the treatment of humans and animals; plants and animals and microorganisms; computer programs and business methods; new uses of known products; plant varieties and genetic material. However the Least Developed Countries should delay providing protection for pharmaceutical products until at least 2016³. Those who currently provide protection for such products should seriously consider amending their legislation (CIPR, 2002).

Agriculture and Genetic Resources

Developing countries need to adopt a *sui generis* system for protection of their agriculture and genetic resources and not allow patenting of animals and plants as is allowed under TRIPS, because of the restrictions patents may place on use of seed by farmers and researchers.

Developing countries are home to a large variety of genetic resources and are highly dependent on their agriculture. The patent protection system lays a large number of restrictions on use of seeds for reuse, sale and sharing both by farmers and researchers. This is highly injurious to the well being of their farmers and plant breeders who in many cases are the farmers themselves. Another factor that the developing countries have to guard against is the destruction of their genetic resources through monocultures promoted by large multinational agro corporations.

Some of the initiatives that can be explored by these countries are listed here. Developing countries with limited technological capacity should adopt a restrictive definition of the term “microorganism.” Countries that have, or wish to develop, biotechnology-related industries may wish to provide certain types of patent protection in this area. If they do so, specific exceptions to the exclusive rights, for plant breeding and research, should be established. The extent to which patent rights extend to the progeny or multiplied product of the patented invention should also be examined and a clear exception provided for farmers to reuse seeds. (CIPR, 2002)

Because of the growing concentration in the seed industry, public sector research on agriculture, and its international component, should be strengthened and better funded. The objective should be to ensure that research is oriented to the needs of poor farmers; that public sector varieties are available to provide competition for private sector varieties; and that the world’s plant genetic resource heritage is maintained. (CIPR, 2002)

Thomas (2005) has illustrated how governments, researchers and universities have taken various steps to obviate the obstacles created by large multinationals always ready to litigate on the matter. These include the Public Sector Intellectual Property Resources for Agriculture (PIPRA) initiative, the Centre for the Application of Molecular Biology to International Agriculture (CAMBIA), and the African Agricultural Technology Foundation (AATF). The PIPRA initiative of some U.S. universities operates in a co-operative framework and advocates the retention of rights to use the technology for research purposes while licensing commercial use. Another unique venture planned by the PIPRA is to develop an IP asset database, which provides an overview of IPRs currently held by public-sector research institutions, including up-to-date information on the licensing status of agbiotech patents.

CAMBIA, a non-profit public-sector agricultural research institution in Australia, launched the open-source approach that favors patenting but licenses technologies

with an Open General License (OGL). The CAMBIA license allows patenting of technologies, yet it is like an OGL since it allows anyone to use the technology for non-commercial research as long as improvements are shared with rest of the world.

The public-private collaboration model of the AATF reinforces the importance of agbiotech to food security and the need to provide scientists with technologies having the Freedom to Operate. The food security of a large population in developing countries is dependant upon research that came out by mostly publicly funded research organizations in developing countries. Effective patenting and licensing strategies will have to be devised by these institutions if they are to fulfill their missions. The capacity building of scientists in developing countries essential to enable them to deal with IP and transfer of technology is also required.

Traditional Knowledge, Folklore and Geographical Indications

It is imperative for the developing countries to define and document their traditional knowledge, but it is easier said than done. India has taken a lead in this and a Traditional Knowledge Digital Library (TKDL) was undertaken to document all the written and unwritten texts about the Indian traditional medicine systems, including the plants used and their uses. Traditional knowledge by definition is that which is undocumented and in many terms belongs to the whole community. This is the reason that its violations are easier. A rigid legislation encompassing knowledge and folklore may not be the answer, but it is important that the debate on whether it should be covered under copyrights or a *sui generis* system be settled soon. The patent offices, copyright registries (where they exist) and the international copyright societies should have copies of these to prevent violations. This would help in protecting traditional knowledge. Another important issue to be addressed is control over the knowledge and remuneration to communities whose knowledge is being exploited. All these need to be done immediately to stop further erosion of these valuable community treasures. For geographical indications, each country should maintain its register of geographical indications and stress for one on the international level, too. This will help in defending cases on patents granted to their products by other countries.

Various countries have adopted different methods to protect their traditional knowledge, folklore and geographical indications. Australia created a nation certification trademark for Aboriginal and Torres Strait Islander artists in Australia. This Label of Authenticity is intended to help promote the marketing of the art and cultural products and deter the sale of products falsely claiming to be of Aboriginal Origin. In Colombia, a specific provision of law prohibits registration of the signs consisting of names of indigenous and Afro-American communities, which constitute an expression of their culture, without the explicit authorization of the Communities in question or the request by the

communities themselves. Vietnam has granted a patent for a traditional preparation of medicinal plants used to help fight drug-addiction, and a trademark registered for a traditional balm made of medicinal plants (the plant name is *Truong Son*). Venezuela and Vietnam protect traditional knowledge through geographical indications. *Sui Generis* systems have been devised by Brazil, Costa Rica, Guatemala, Panama, Philippines, Samoa, Peru and Thailand (O'Connor, 2003).

Institutional Capacity

All the strategies above would only be successful if there is the political will and the institutional capacity to implement them. Developing countries need to build awareness among their populace about the rationale and consequences of IPR on the various facets of life. Only legislation on IPRs is not enough. It has to be followed by the efficient executive and judicial actions where need be. Researchers, academics, and civil society have to be engaged in this debate to help protect societies from exploitation while promoting and encouraging innovation.

Conclusion

Intellectual Property Rights are one of the major concerns of developing world policy makers in the post TRIPs era. Despite the benefits propounded by advocates of stronger IPR regimes, the issues facing developing countries at different levels of development vary according to their social, economic and technological levels. In the knowledge-based economies of the present day world issues in copyright and patents are crucial for the developing world. However, issues regarding application of present IPR regimes or *sui generis* to agriculture and genetic resources, and traditional knowledge, folklore and geographical indications which are implicitly not covered under the TRIPs Agreement need to be examined critically as they affect the food security and health of large populations in developing countries.

Developing countries need to form strategies learning from the experience of sister nations while keeping in mind the obligations of the TRIPs Agreement and the pressures from the developed world. Successful implementation of the chosen strategies will depend *inter alia* on the awareness created among the stakeholders about the role and relevance of IPRs. The expressed intention needs to be backed by institutional capacity to legislate, execute and enforce these policies.

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End Notes

1 "Sui Generis" means "Being the only example of its kind, unique."

2 Examples in this paragraph have been quoted from Shiva, 2004

3 WTO had agreed to defer TRIPs implementation in Least Developed countries till 2016 under its staggered schedule and these countries should utilize the time to protect and build their industry. They should resist pressure from developed countries till that time. (CIPR, 2002).