

IPRS, TECHNOLOGY TRANSFER AND CLIMATE CHANGE

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1. Technology Transfer in the “Environment and Development” Process

Climate change is now recognized as a major, if not the most important, environmental problem. Now that the scientific battle to have this problem recognized seems to have been won (with a few exceptions), attention is turning on solutions.

A major area in the search for solutions is the design and spread of more energy-efficient technologies that reduce or eliminate climate change inducing emissions. In the next few years, it can be expected that these technologies will be increasingly introduced.

However, intellectual property rights over such technologies may pose a hindrance to their dissemination and use. In particular, developing countries may be expected to face such obstacles to the transfer of technology that is aimed at reducing the sources of climate change.

This paper looks at some of the issues relating to IPRs and the transfer of environmentally sound technologies.

The need for transfer of environmentally sound technology (EST) to developing countries has for a long time been seen as one of the major aspects of the process of sustainable development. During the 1992 United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro and the process leading to it, technology transfer and financial resources were the two major cross-cutting issues, and constituted the two main demands of the developing countries.

In the UNCED negotiating process, the key issue in technology transfer was IPRs. The Group of 77 countries argued that IPRs had to be relaxed in the case of EST, for otherwise IPRs would hinder the developing countries' access to such technology.

The developed countries' delegations were very sensitive on this point and refused to concede. Whilst agreeing that concessional terms should be encouraged for the transfer of ESTs, they insisted that IPRs (such as patents) be applied and that an exception should not be made in IPRs regimes on such technologies.

Finally, the chapter on technology in Agenda 21 (a programme of action for sustainable development adopted at UNCED) called for action to promote and finance the access to and transfer of ESTs to developing countries on favourable (including concessional and preferential) terms. But it also says these terms must be “mutually agreed” upon and also take into account the need to protect IPRs.

The full application of such rights would be a major barrier to technology transfer, and deprive the commitment to transfer technology of much of its content. There is thus a fundamental tension within the agreement on technology, and room for more discussion on how to operationalise the Agenda 21 proposals on technology cooperation, transfer and capacity building. The developing countries consider this to be an area where assistance from the developed countries is critically needed.

2. IPRs and Technology Transfer

Since Rio, there has also been little or no progress on facilitating the transfer of EST to the South. At the United Nations Commission on Sustainable Development, a working group on technology transfer was set up in 1993, but after a few years the group was closed down, signifying the erosion and loss of importance the subject has suffered. Instead of the concessions asked for by developing countries, the reverse trend towards much stricter IPRs regimes (including for EST) prevailed, when the TRIPS Agreement came into force together with the WTO in 1995.

Proponents of a strict IPRs regime have argued that it would encourage innovation and contribute to technology transfer. Opponents point out that granting exclusive rights to IPRs holders would enable them to monopolise the technology, hinder research by other parties and prevent the use by and spread to other parties.

At international policy fora, developed countries have been taking the pro-IPRs position whilst developing countries have generally raised concerns about the negative effects of a strict IPRs regime on technology transfer.

In relation to the environment, some technologies can have a negative impact whilst others may have a positive impact. It would be rational for policy frameworks (whether at national or international levels) to recognise the need to discourage the former whilst encouraging the latter.

In so far as the granting of IPRs provides an incentive for developing technologies, then the ability to prohibit IPRs for environmentally-damaging technologies should be part of the policy armoury of a government. The TRIPS Agreement recognises this point (see Section 4 below).

In relation to EST, there is a strong case that IPRs hinder the ability of developing countries to attain EST as well as new technologies in general. To begin with, the great majority of patents are held by companies based in North America, Western Europe or Japan. As Oh (2000a) points out: "Only 3 percent of world patents are owned by inventors in the developing countries. Specifically, the vast majority of biotech patents are in the name of companies originating in the developed countries. A survey of the biotechnology patents showed that between 1990-1995, around 25,000 patents were granted throughout the world. Thirty-seven percent of these originated in the US, a similar percentage from Japan, whilst 19 percent were from the European Union. The

remaining 7 percent of patents came from the 'rest of the world', including all of the developing countries.”

It is sometimes argued that a strong IPRs regime in a country will encourage the inflow of foreign direct investment (FDI), which in turn will bring about technology transfer to the host country. However, according to an UNCTAD study on TRIPS and developing countries: “To date, there is little conclusive evidence that strengthened intellectual property protection would consistently expand the transfer of technology to developing countries. Key determinants of technology transfer (through FDI and through arm’s-length licensing) include the costs of making such transfers, which depend on local technological capability. This capability refers to factors such as skill availability, technology supply structures, R&D capacity, enterprise-level competence and institutional and other supporting technological infrastructures” (UNCTAD 1996: p 18).

By strengthening IPRs in developing countries, the TRIPS Agreement can also encourage foreign firms to import technology at higher prices rather than produce it in the host country, and also enable technology suppliers to raise their prices. These two factors raise the cost and reduce the flow of technology to developing countries.

There are several ways in which a strong IPRs regime can hinder access of developing countries to technology, and transfer to developing countries of technology (including EST).

Firstly, a strict IPRs regime can discourage research and innovation by locals in a developing country. Where most patents in the country are held by foreign inventors or corporations, local R&D can be stifled since the monopoly rights conferred by patents could restrict the research by local researchers. Strict IPRs protection, by its apparent bias, may actually slow the pace of innovation in developing countries, and increase the knowledge gap between industrial and developing countries. In such situations, the IPRs system favours those who are producers of proprietary knowledge, vesting them with greater bargaining powers over the users (Oh 2000a).

Secondly, a strict IPRs regime makes it difficult for local firms or individual researchers to develop or make use of patented technology, as this could be prohibited or expensive.

Thirdly, should a local firm wish to “legally” make use of patented technology, it would usually have to pay significant amounts in royalty or licence fees. As pointed out earlier, TRIPS increases the leverage of technology suppliers to charge a higher price for their technology. Many firms in developing countries may not be able to afford the cost. Even if they could, the additional high cost could make their products unviable. Moreover, there could be a large drain on a developing country’s foreign exchange as a result of having to pay foreign IPRs holders for the use of their technology. Many developing countries with serious debt problems will be unable to afford the cost of using the technologies.

Fourthly, even if a local firm is willing to pay the commercial rate for the use of patented technology, the patent holder can withhold permission to the firm or impose onerous conditions, thus making it impossible or extremely difficult for the technology to be used by the firm.

This can hinder progress of developing countries towards the use of EST. Holders of the patents to such technologies, which are usually Northern-centred transnational companies, can refuse to grant permission to companies in the South to use the technologies, even if they are willing to pay market prices; or onerous conditions are imposed; or else the technologies may be made available only at high prices (due to the monopoly enjoyed by the patent holders). Companies in the South may not be able to meet the conditions or afford to pay such prices, and if they do their competitiveness could be affected. As a result, developing countries may find difficulties in meeting their commitments to phase out the use of polluting substances under international environment agreements, such as the Montreal Protocol.

3. Case Study of Effect of IPRs on Implementation of the Montreal Protocol

Local firms in some developing countries are finding it difficult to have access to substitutes for chlorofluorocarbons (CFCs), chemicals used in industrial processes as a coolant, which damage the atmosphere's ozone layer. This hinders their ability to meet commitments under the Montreal Protocol, an international agreement aimed at tackling ozone-layer loss by phasing out the use of CFCs and other ozone-damaging substances by certain target dates.

Under the Montreal Protocol, developed countries originally agreed to eliminate production and use of CFCs by the year 2000, whilst developing countries are given a 10-year grace period to do the same. A fund was set up to help developing countries meet the costs of implementing their phase-out, and the protocol's Article 10 provides for technology transfer to developing countries. Each party is obliged to take every practical step to ensure that the best available and environmentally safe substitutes and related technologies are expeditiously transferred to developing countries, under fair and most favourable conditions.

A study of the effect of IPRs on technology transfer in the case of India in the context of the Montreal Protocol has been conducted by Watal (1998). She points out that technology-transfer provisions in the Montreal Protocol are particularly relevant for developing countries which are producers of ozone-depleting substances (ODS), such as India, Brazil, China, South Korea and Mexico. In India, Korea and China, such production is dominated by local-owned firms, for which the access to ozone-friendly technology on affordable terms has become a central issue of concern.

The study concludes that: "Efforts at acquiring substitute technology have not been successful as the technologies are covered by IPRs and are inaccessible either on account of the high price quoted by the technology suppliers and/or due to the conditions laid

down by the suppliers. This would require domestically owned firms to give up their majority equity holding through joint ventures or to agree to export restrictions in order to gain access to the alternative technology.” Moreover, financial assistance to acquire the technology was also not effective. A report of the executive committee on technology transfer of the protocol stated that the terms of freely-negotiated technology transfers, including costs such as patents, designs and royalties, may not always be accommodated by the Multilateral Fund’s funding policies. “Thus, while prices of alternative technologies are unaffordable on account of IPRs, access to these is limited due to inadequate funds domestically and lack of financial assistance from the Multilateral Fund, creating a major hurdle in transiting to ozone-friendly production, especially among producer nations. For ODS producer countries with domestically owned firms, therefore, technology transfer is a distinct and crucial issue in itself requiring immediate attention” (Watal 1998: pp 1-2).

Two specific cases from Watal’s study show the acute problems faced by local firms in their attempts to access technology from suppliers who hold patents over the products. CFCs, which are ozone-depleting, have been used in refrigerators and air-conditioners that are manufactured in India. In most major sub-sectors, two alternative substitutes (HFC 134a and hydrocarbon) are available. Most Indian refrigerator manufacturers would like to convert to using HFC 134a. Indian producers of CFCs are very keen to acquire the technology for making HFC 134a for domestic and export sale. However, their efforts to access the technology were unsuccessful. Only a few companies in the developed countries control the patents and trade secrets related to HFC 134a, and thus developing countries have to either pay high royalty fees to produce them locally or lose the local and international markets for this alternative. One of the Indian companies that sought to access the technology was quoted a very high price of US\$25 million by a transnational company that produces HFC 134a and that holds a patent on the technology. The supplier also proposed two alternatives to the sale, namely, that the Indian firm allow the supplier to take majority ownership in a joint venture to be set up, or that the Indian firm agree to export restrictions on HFC 134a produced in India. Both options were unacceptable to the Indian company, while the quoted price was also unrealistically high as it was estimated that the technology fee should at most have been between US\$2 and \$8 million.

The ozone-depleting substance halon is used in fire extinguishers and many other products. India imported all the halon it required up to 1990. Since 1991 it has manufactured halon 1211 and since 1995-96 it developed the technology for halon 1301. Producers of fire protection systems would like to convert from using halon 1301 to HFC 227ea (commercially known as FM 200). India would like to produce this alternative locally. FM 200 is covered by a methods and composition patent filed by a US company in 1995 with a life of 20 years. It was filed in several countries including China, Korea and Russia (but not in India, which, up to the time of the study, did not allow such patents). According to industry sources, China and Russia successfully developed the process for FM 200 through indigenous R&D but will be prevented from marketing the final product due to this patent. An additional problem is that the patent owner has imposed several restrictive conditions for FM 200, such as that the components used in

the fire protection systems should have the approval of the Underwriters' Laboratory (UL) or Factory Mutual (FM) of the US, and the systems' design must meet the requirement of NFPA-2000 (USA) and the approval of UL and FM (USA); and the final inspection/clearance of the system (including various tests following international standards) must meet the approval of UL and FM. The costs to India to produce the alternative to halon 1301 would include US\$1.5 million for licence fees to produce alternatives just for the halon 1301 sub-sector and another US\$1.4 million to convert halon portable systems to ODS-free systems. Indian firms that have tried to acquire the technology faced the problem not only of finance, but found that the owner of the patent was not interested in licensing the technology to wholly owned companies. The patent holder was interested only in joint ventures in which it would hold a majority share. The Indian firms did not want to divest their equity holding but only wanted to buy the technology. Thus, in the case of HFC 227ea as in the case of HFC 134a, the technology supplier, which also owned the patent, was unwilling to transfer the environmentally sound technology to India, not even on commercial terms. In such a situation where the alternative cannot be produced within the country, the users of halon 1301 even in strategic sectors such as defence and power plants will have to depend entirely on imports of HFC 227ea to meet their demands.

These examples show how much the developing countries have been put on the spot. They join international environmental agreements and commit themselves to taking painful steps to change their economic policies or production methods. Financial aid and technology transfer on fair and most favourable terms are promised during the hard negotiations, to persuade the South countries to sign on. Then, when the agreements come into force, the funds fall far short of the promised level, and technology transfer fails to materialise.

Meanwhile, in another forum like the WTO, other treaties such as TRIPS are negotiated which produce or contribute to an opposite effect, increasing the obstacles to developing countries' access to EST. Yet, when the time comes, the developing countries can be expected to be pressured to meet their full obligations, such as phasing out the use of CFCs (in the Montreal Protocol) or reducing emissions of greenhouse gases (in the Climate Change Convention). There is thus an unfair imbalance. The North does not (or does not adequately) meet its obligation to assist the South, and the South (when meeting its commitments), because of the lack of aid and technology, will face economic dislocation.

One remedy being proposed by some public interest groups and developing countries is to revise international laws on patents so that the full weight of IPRs is not applied to EST.

4. TRIPS, Technology and the Environment

(a) Major Concerns about Effects of TRIPS on the Environment

In the WTO's Committee on Trade and Environment, the topic "TRIPS and environment" is being discussed under two issues: the relationship of the TRIPS Agreement with access to and transfer of technology and the development of environmentally sound technology; and the relationship between the TRIPS Agreement and multilateral environmental agreements which contain IPRs-related obligations.

There are several concerns in relation to the potential effects of TRIPS on the environment, including the following:

- (i) Will TRIPS encourage the spread of environmentally harmful technologies?
- (ii) Will TRIPS discourage or even prevent the spread and transfer of environmentally sound technologies?
- (iii) Will TRIPS ironically facilitate the transfer of knowledge on the use of biological resources from communities in developing countries to enterprises or institutions in developed countries without the former being rewarded whilst the latter are granted exclusive patent rights?

A framework of discussing the issues relating to TRIPS, technology and environment from the perspective of developing countries was interestingly provided at the Committee on Trade and Environment meeting in March 1996 in a paper presented by India (India 1996). The paper stated that the types of intellectual protection (IP) covered in TRIPS are relevant in this context: patents, plant variety protection, layout designs of integrated circuits and undisclosed information. Two types of technologies incorporating IP are distinguished: those that harm and those that benefit the environment. The use of the first should be discouraged, and the second encouraged, by the international community.

The Indian paper's section on patents stated that for technologies harmful to the environment, measures needed to discourage their global use may include exclusion from patentability (so that incentives are not given to generate such technologies) and ban of their use or commercial exploitation. The TRIPS Agreement recognises this reasoning in Article 27.2. For environmentally beneficial technologies, to encourage their global use, the paper proposes that some amendments or clarifications be made to the TRIPS Agreement. (These two points are elaborated on below.)

It suggests that amendments to the TRIPS Agreement in Section 5 (Articles 27, 31, 32, 33), Section 6 (Articles 36, 37, 38) and Section 7 (Article 39), and an understanding on plant variety protection (Article 27), dispute settlement (Article 64) and undisclosed information (Article 39), may be required.

The Indian paper was an early submission to the work of the Committee on Trade and Environment on TRIPS and the environment and set a useful framework for discussions on the issue.

(b) Excluding the Patenting of Environmentally Harmful Technologies and Products

The need for countries to be able to prevent the granting of patents for environmentally harmful products or technologies is recognised in the TRIPS Agreement. Its Article 27.2 allows members to exclude from patentability “inventions, the prevention within their territory of the commercial exploitation of which is necessary to protect *ordre public* or morality, including to protect human, animal or plant life or health or to avoid prejudice to the environment, provided that such exclusion is not made merely because the exploitation is prohibited by their law.”

However, WTO members that wish to make use of this provision to prevent the patenting of environmentally harmful technologies may face the disapproval of some other members that could contest whether the prohibited technologies constitute “prejudice to the environment” or whether the exclusion is needed to protect life and health. In other words, there can be a clash of interpretations as to whether a particular technology (for example, genetic engineering) or its products are harmful to the environment or to human, plant and animal life and health. The fear of a dispute and of being hauled up before a WTO dispute panel may to some extent discourage a WTO member from making use of this provision. Thus, whilst TRIPS does afford leeway for countries to exclude harmful technologies from patentability, the test of the usefulness of this flexibility will come when some members make use of this provision to exclude the patenting of certain technologies and are then challenged by other members.

(c) Relaxing IPRs Standards for Environmentally Sound Technologies

For environmentally beneficial technologies, to encourage their global use, and in cases where other measures for technology transfer are not possible, India proposed three points:

- (i) To allow free production and use of such technologies as are essential to safeguard or improve the environment, members may have to exclude these technologies from patentability. Such an exclusion is not incompatible with TRIPS and may have to be incorporated through a suitable amendment.
- (ii) For currently patented technologies, members may revoke patents already granted, if this is done in consonance with the Paris Convention and is subject to judicial review;
- (iii) To encourage the use of environmentally beneficial technology, members should be allowed to reduce the term of patent protection from the present minimum of

20 years to, say, 10 years, “so as to allow free access to environmentally-beneficial technologies within a shorter period.”

5. Provisions in TRIPS for Technology Transfer

The TRIPS Agreement has several references and provisions that deal with technology transfer.

Article 7, which contains the objectives of the agreement, states: “The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, 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.”

Article 8 is on principles. One of the two principles (Article 8.2) is as follows: “Appropriate measures, provided that they are consistent with the provisions of this Agreement, may be needed to prevent the abuse of intellectual property rights by right holders or the resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology.”

Article 66.2 on least developed countries states: “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.”

Despite these and other provisions in TRIPS that seek to promote technology transfer, in reality little or nothing has been done by developed countries to either provide concessions to developing countries or provide incentives to (or impose obligations on) their enterprises and institutions to disseminate or transfer technology to developing countries. This has led to an erosion of confidence in the seriousness or sincerity of the developed countries to fulfill the technology-transfer obligations of TRIPS. For example, in a paper to the WTO’s General Council and to the TRIPS Council, the Indian delegation stated: “There has been little effort to implement this provision (Article 66.2), raising doubts about the effectiveness of the Agreement to facilitate technology transfers” (India 2000a).

In the same paper, India recounted an earlier proposal it had made to the Committee on Trade and Environment, “that owners of environmentally sound technology and products shall sell such technologies and products at fair and most favourable terms and conditions upon demand to any interested party which has an obligation to adopt these under national law of another country or under international law.” Developing countries access technologies usually through licences and technology transfer agreements. The paper points out that technology seekers in developing countries face serious difficulties in their commercial dealings with technology holders in developed countries. These difficulties include: (i) those arising from imperfections of the market for technology; (ii) those

arising from lack of experience and skill of enterprises and institutions in developing countries in concluding legal arrangements for technology acquisition; (iii) government practices (legislative and administrative) in developed and developing countries which influence the implementation of national policies and procedures designed to encourage the flow of technology to, and its acquisition by, developing countries.

For the TRIPS provisions on technology transfer to be implemented, these difficulties have to be addressed. To overcome some of the difficulties, developing countries would need to build suitable safeguards in their domestic IPRs laws. Also, commercially viable mechanisms need to be established to address the problems and needs of enterprises or institutions in developing countries that want to acquire technology but find its cost prohibitive due to economies of scale and other reasons. Moreover, the high cost of technology makes it difficult for smaller and poorer developing countries to acquire technology on commercial terms. They can only acquire the needed technology through government-to-government negotiations and with financial aid provided either by developed countries' governments and other institutions, or by inter-governmental organisations. Another problem is the denial of dual-use technologies, even on a commercial basis, to developing countries; under this guise, a variety of technologies and products required for their growth process is being denied to developing countries. (India 2000a: pp 2-3).

In order that the TRIPS objectives, principles and provisions on technology transfer are made effective, a review of how to operationalise the relevant provisions of the TRIPS Agreement should be carried out. The obligations on developed countries to provide incentives to or oblige the enterprises or other institutions in their countries to transfer technology to developing countries could be made stronger, with regular reviews of the implementation. Relaxation of the standards of protection for environmentally sound technology should also be done, including through amendments to the agreement. Progress towards the goal of technology transfer is essential in order for there not to be a further loss of confidence in the TRIPS Agreement's purported objective of technology dissemination and transfer.

Note: Much of this paper is extracted from the author's book, Intellectual Property, Biodiversity and Sustainable Development (TWN).

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