

Abstract Patents, Licences and Technology Transfer: Assessing TRIPS'
Impact on Developing Countries' Approaches to Climate Change

The following analysis seeks to demonstrate how TRIPS provisions mandating respect of IPRs generally have a negative effect on developing countries' – and especially Least Developed Countries (LDCs)'s – ability to attract, research, develop and implement new technologies, let alone those needed for effective adaptation to and mitigation of climate change. These states' inability to obtain Environmentally Sound Technologies (ESTs), or the know-how associated with their most effective use suggests that the current multilateral framework for the protection of IPRs disproportionately affects poor members within the WTO. These are precisely the countries towards which industrialized WTO members (such as the United States, for instance) have a “duty” to incentivize technology transfer. However, empirical findings suggest that voluntary incentive mechanisms to transfer technologies to LDCs have largely failed in their mission. Strong middle-income countries such as China and India have been able to cope with TRIPS rules and even benefit from technology transfer, technological know-how and R&D investments. Yet, the benefits from compulsory licensing of patented green technologies, perhaps with compensation mechanisms such as the one proposed by India, could greatly contribute to a rapid spread of climate change mitigation and adaptation technologies worldwide. Nevertheless, this would inevitably reduce industrialized countries' comparative advantage in the generation, production and diffusion of such innovations, giving strong reasons to believe it will be fiercely opposed.

Introduction:

Coupling incentives for the *creation* of technological innovations with the developmental needs for their *diffusion* is a core issue in contemporary debates surrounding the protection of intellectual property rights (IPRs). In an era of intensified international trade, investment, information flows and multilateral regulation, the protection of incentive mechanisms behind the generation of new knowledge and technologies is seen as a top priority. Indeed, the World Trade Organization (WTO)'s Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) seeks to reward research and development (R&D) efforts through a global harmonization of national patenting and licensing rules. By ensuring investors' profit and technically prohibiting free riding by third parties able to emulate a given innovation at lower costs, strong patent regimes effectively reward innovators.

However, while patents on new technologies are protected and legally binding (through the WTO's Dispute Settlement Mechanism—DSM), the mechanism in charge of their diffusion and dissemination seems to crucially lack both “teeth” and clarity. More importantly, as outlined by the United Nations Framework Convention on Climate Change (UNFCCC) and the Intergovernmental Panel on Climate Change (IPCC) these latter mechanisms, responsible for *technology transfer*, constitute the key to achieving climate change adaptation and mitigation policies, thus potentially opening the door towards future global sustainable development.

The following analysis seeks to demonstrate how TRIPS provisions mandating respect of IPRs generally have a negative effect on developing countries' – and especially Least Developed Countries (LDCs)'s – ability to attract, research, develop and implement new technologies, let alone those needed for effective adaptation to and mitigation of climate change. These states' inability to obtain Environmentally Sound Technologies

(ESTs) or the know-how associated with their most effective use suggests that the current multilateral framework for the protection of IPRs disproportionately affects poor members within the WTO. These are precisely the countries towards which industrialized WTO members (such as the United States, for instance) have a “duty” to incentivize technology transfer; however, empirical data suggests a very different picture.

To defend the aforementioned argument, this piece will be divided in three parts. First, it will provide a brief historical contextualization of climate change and IPR regimes. The second section will detail the different ways in which patent regimes and standards required by the TRIPS agreement affect developing countries’ approaches to climate change adaptation and mitigation, both from a legal and pragmatic point of view. Finally, the last portion will be dedicated to overviews of empirical evidence of effective technology transfer (or lack thereof), before concluding on the future of climate change and IPRs negotiations.

I) Contextualizing Regimes: Climate Change and IPR Governance

Effectively grasping the interactions between sustainable development through effective adaptation and mitigation policies, and the protection of IPRs necessitates some background understanding of how the specific issue of “technology transfer” is defined and incentivized in both the climate change and intellectual property regimes.

a. The UNFCCC and IPCC

Climate change as a crucial policy issue has gained extensive prominence during the last few decades. Main developments in such direction include the establishment of the Intergovernmental Panel on Climate Change (IPCC), the creation of United Nations Framework Convention on Climate Change (UNFCCC), and the resulting drafting of the Kyoto Protocol and its sustainable development target mechanism. Indeed, as discussed by Adams, the IPCC was established in 1988 in order to “...assess available information on the science, impacts, and economics of climate change and to formulate adaptation and mitigation options” (Adam 3). This joint effort, led by the World Meteorological Organization and the United Nations Environment Programme (UNEP), produced a series of research reports, including the prominent IPCC Fourth Assessment Report of February 2007, which confirmed “with very high confidence” that man-made impact on climate has led to global warming (IPCC 4th Assessment Report, 37).

With regards to technology transfer, the same authors assert that there is “*high agreement and much evidence*” that new technologies will allow meeting reduction targets, “assuming appropriate and effective incentives are in place to assure the development, acquisition, deployment and diffusion of technologies” (68). The UNFCCC, put in place in 1992 with the objective of stabilizing Greenhouse Gases (GHGs) emissions responsible for global warming at safe levels, is equally concerned with technology transfer. Indeed, it established the Kyoto Protocol in 1997 as legal instrument to set binding emission reduction targets on main GHG emitters—that is, developed countries. Within this framework, the Clean Development Mechanism (CDM) should facilitate technology transfer by allowing industrialized countries to regulate emissions abroad, which would result in foreign investment (FDI) and joint ventures, allowing these countries to develop sustainably (Adam 4-6).

In particular, the Kyoto Protocol stresses the importance of access to “...environmentally sound technologies [ESTs]¹, know-how, practices and processes pertinent to climate change, in particular for developing countries...” along with incentives for the private sector to transfer such technologies “needed to...meet the agreed...commitments” (Hutchison 523). However, obvious limitations exist on this mechanism’s legal power. Compliance with Kyoto’s standards and targets is voluntary, and the United States (US), one of the main global GHG emitters, has not ratified the agreement, thus greatly limiting the credibility, scope and power of regulations and future negotiation sessions such as the 2009 Copenhagen Summit (as discussed by Kogan).

On the other hand, the US is a member of the WTO, which, in contrast to the Kyoto Protocol, possesses a legally binding DSM capable of inflicting real costs on violators. The provision of technology transfer through such an organism would thus be more optimal and efficient. The following subsection investigates the availability of these mechanisms within the WTO’s TRIPS agreement.

b. From WIPO to TRIPS (to TRIPS-Plus?)

Intellectual Property Rights (IPRs) are of strategic importance to countries for a variety of reasons. Essentially, they allow investors in R&D to secure returns via the provision of mechanisms of exclusive control over intellectual property, its implementation, production and distribution. Without such safeguards, it is argued, third parties with comparative advantages in factors of production could emulate and reverse-engineer these new technologies, effectively free-riding and decreasing the returns of the initial investors, and consequently diminishing their incentives to re-invest in R&D (Shadlen 115-116; Hutchison 521). This, in turn would slow down the flow of innovation crucial to sustain effective creation and deployment of ESTs.

National patent regimes are thus created by individual states to solve the conflict outlined above. As Shadlen crucially points out, however, it is worth noting that in general, developed and developing countries feature different intellectual property regulations because they have conflicting interests. While industrialized, knowledge-producing states favour very strong regimes to safeguard heavy investments in R&D, developing countries have a stronger stake in the diffusion of technologies, thus favoring less stringent regimes (Shadlen 116). Any multilateral framework dealing with IPRs was thus expected to feature elements of North-South conflict from its onset. Indeed, as Abbott relates, both the UN branch dealing with IPRs (the World Intellectual Property Organization—WIPO, established in 1967) and the TRIPS agreement that came into effect on January 1st, 1995, were drafted so as to preserve “...significant government flexibility in implementing norms” in order to minimize conflict among states (Abbot 7).

Unlike the WIPO, however, the TRIPS Agreement is linked to the WTO’s DSM, and is therefore legally binding; in other words, it can punish violations of intellectual property. On the other hand, TRIPS also recognizes that industrialized countries must

¹ The United Nations define ESTs by stating that these “...protect the environment, are less polluting, use all resources in a more sustainable manner, [and] recycle more of their wastes and products...in a more acceptable manner than the technologies for which they were substitutes” (Adam 11). Such a characterization automatically incorporates elements of technological innovation and know-how into the definition of ESTs, as they are needed to achieve efficiency and sustainability gains required by these technologies.

commit to technology transfer through “best endeavor clauses” (Littleton 6). Controversially, shortly after the Agreement’s creation, countries exploiting the flexibilities allowed by TRIPS (with regards to adaptation periods for respecting intellectual property in developing countries and LDCs) started being unilaterally pressured by strong governments, and in particular by the Office of the United States Trade Representative (USTR), to tighten IPR regime beyond TRIPS requirements, to reach what have been coined by many “TRIPS-Plus” standards (Shadlen 118). Such behavior led developing countries to demand a clear definition of the circumstances under which the possibility to violate patent rights was granted under WTO law, which materialized in the 2001 Doha Declaration on the TRIPS Agreement and Public Health.

While the content of the Doha Declaration and its implications for the transfer of technologies will be studied more in depth in the next section, it is sufficient to note for now that both the climate change and IPR multilateral frameworks recognize the need to balance the tension between the creation and dissemination knowledge, so as to address sustainable development goals for the future. How do the WTO’s TRIPS Agreement obligations to respect intellectual property affect this delicate balance?

II) TRIPS’ Effects on Technology Transfer: Legal and Pragmatic Aspects

Through an analysis of the legal structure, commitments and incentive mechanisms responsible for the diffusion of new technologies relevant to climate change adaption and mitigation policies, this section seeks to demonstrate how TRIPS favors the generation and strong protection of intellectual property, rather than its diffusion through technology transfer to developing countries and LDCs.

a. “Best Endeavor Clauses”

As succinctly argued by Matthew Littleton, in his report presented at the International Centre for Trade and Sustainable Development (ICTSD)’s Global Platform on Climate Change, Trade Policies and Sustainable Energy in June 2009, power asymmetry in TRIPS with regards to technology generation and dissemination rests in “best endeavor clauses” (Littleton 6). Specifically, he points out that “the special needs of the least-developed country Members...to create a sound and viable technological base” (needs that are recognized by the WTO itself) must be supported through voluntary and non-binding “best endeavor clauses” (7). These often result in lacking firm commitment by members. For instance, responsibility for negotiating technology transfer is shifted to subsidiary bodies such as the Committee on Trade and Environment, or the Working Group on Trade and Technology Transfer (WGTTT), which not only feature lower-level representatives and delegates with lower decisional authority, but are also largely considered to be impotent and ineffective (6).

While technology transfer from the wealthiest to the poorest members of the WTO – or lack thereof – is not punishable law, a number of legally binding instruments do exist to discourage and punish abuses of patent rights and trade secrets, while also greatly limiting the use of “traditional” national intellectual property laws such as compulsory licensing and reverse-engineering.

b. Violations of Patent Rights and Compulsory Licensing

The literature on patent regimes, TRIPS and technology transfer dominates the debate surrounding the impact of intellectual property on climate change adaptation and mitigation. Authors such as Adam, Littleton, Hall and Helmers, Hutchison, Abbot, Gupta, Kogan, Percival and Miller, and Moon, have greatly contributed to the available research, although there does not seem to be a general agreement on the effects of stringent patent regimes protected by TRIPS on technology transfer of ESTs.

For instance, Percival and Miller find that although the use of compulsory licensing for pharmaceuticals (allowed after the 2001 Doha Declaration) was indeed needed to solve health crises², green technology would benefit more from alternative mechanisms to incentivize technology transfer, such as bilateral and multilateral environmental agreements, or the domestic redefinition of “innovation” and the ensuing scope of patentability. They thus conclude: “...intellectual property law need not be an obstacle to a global transformation toward a green energy infrastructure that can promote economic development while advancing new levels of international cooperation” (21). Their optimism conflicts with a number of academics who argue that current patent laws defended by the TRIPS agreement undermine the extent of technology transfer to LDCs.

The first, and most logical reason to believe this could be the case comes in direct response to Percival and Miller’s proposal of tightening environmental agreements to assure greater cooperation in technology generation and transfer. The failure of the Kyoto Protocol, and the lack of legal bindingness of the Copenhagen Agreement that originated out of the 15th Conference of Parties (COP) of the UNFCCC in 2009 (as discussed by Kogan), are good elements to believe that these negotiations fora are not the most conducive to improvements in technology transfer of ESTs (Kogan 4).

In “The Role of Patent Protection in (Clean/Green) Technology Transfer,” Hall and Helmers provide further reasons to doubt the feasibility and efficiency of the solutions proposed by Percival and Miller. They preliminarily conclude that “...it is important to remember that firms typically do not rank IPRs highly as an influence on the technology transfer decision,” suggesting that empirically, more stringent intellectual property regimes does not cause higher amounts of EST transfer (Hall and Helmers 12).

Through careful analysis, the authors find evidence that for middle-income developing countries such as China, India and Brazil, effective protection of intellectual property through patents can spur technological transfer; (22-23). For LDCs, however, Hall and Helmers find no correlation between protection of IPRs and technology transfer, as there were (and still are³) no patents in these countries. They thus agree with Percival and Miller’s finding that stronger IPRs do not significantly correlate with the amount of technology transfer (Percival and Miller 20-21; Hall and Helmers 29). Yet, they do not find any reason to believe that issuing compulsory licenses would not solve, at least

² Compulsory licensing was traditionally used as a development policy by developing countries prior to TRIPS, which seeks to prohibit them. It involves forcing government ownership of a license for a patented good at a royalty rate unilaterally determined by the government (Shadlen 155-119). The 2001 Doha Declaration clarified that developing countries could use such practices on patented pharmaceuticals to solve health crises associated with HIV/AIDS.

³ According to the “Extension of the Transition Period Under Article 66.1 for Least Developed Country Members” outlined in Doc. IP/C/64, WTO members agreed to “extend until 1 July 2021 the deadline for least developed countries to protect intellectual property under WTO’s TRIPS.”

partly, the problem of technology transfer⁴. Indeed, as the last section will show, countries such as China and India advocate compulsory licensing techniques, similar to the ones allowed after the 2001 Doha Declaration for pharmaceuticals.

c. “Trade Secrets” and Other Impediments

Even in cases where a new EST would be readily available, with either no patent or royalty-free licensing, effective technology transfer would not automatically ensue; know-how is a key determinant of technological transfer not captured by patent regimes. As shown in discussions by Abbott and Littleton, “trade secrets” often contain such crucial knowledge, of which the unlawful disclosure is punishable by the WTO’s DSM. More precisely, Littleton relates that “[p]rotection for undisclosed information is required under Article 39,” and governments are prohibited from circulating these data unless such a measure is necessary for public security, or unless steps are taken to provide protection against “unfair” commercial use (Littleton 11).

Moreover, Abbott relates that “trade secrets protect confidential commercially valuable information [which]...may take many forms, including customer lists, recipes and computer software design” (Abbott 4). While he admits that trade secrets had a greater impact in the pharmaceutical debate than they have in climate change, the author warns that as far as ESTs are concerned, “trade secrets may likely involve production process technologies that are used in making of new materials” (4). Although seemingly uninfluential, this concession proves that even in the absence of patent rules over ESTs, the protection of trade secrets associated with their production would prevent developing countries from acquiring the background knowledge (“production process technologies”) needed to engage in domestic R&D (“making of new materials”, for instance).

This, in turn, suggests that through asymmetrical commitments, the protection of trade secrets, and patent regimes TRIPS effectively does undermine developing countries’ ability to create, promote, sustain and receive transfers of environmentally sound technologies. Therefore, the last part of this analysis turns to reviewing available empirical evidence, before briefly concluding on the implications for future intellectual property and climate change regimes.

III) Lessons Learned and Roads Ahead

Violations of IPRs (such as patents and trade secrets) are almost automatically carried out by developing countries, as these are predominantly knowledge-importing, rather than knowledge-producing (Shadlen 115-116). This would result in middle-income and least-developed WTO members systematically being on the defendant’s, rather than the accuser, side of potential legal action taken by the organization’s DSM with regards to intellectual property disputes. This is precisely because in contrast, industrialized countries’ “best endeavors” (or lack thereof) to transfer technologies necessary to meet “the special needs of the least-developed country Members...to create a sound and viable technological base” are not legally binding (Littleton 7). One could still argue that this

⁴ In fact, Hall and Helmers note that developing countries’ proposal of “royalty-free compulsory licensing of green technologies” is an exception to standard patenting regulations that is already partially included in TRIPS—public-policy motivated compulsory licenses could be allowed, as they have been for pharmaceuticals after the 2001 Doha Declaration (Hall and Helmers 5).

type of technology transfer being rather “altruistic” in nature (in purely economic terms, it represents a suboptimal outcome by allowing third parties to free-ride on investments), it need not require legal enforcement. Empirical evidence appears to suggest otherwise.

a. The Impacts of “Best Endeavors”: Evidence from LDCs

The ICTSD’s policy brief analyzing country submissions to TRIPS Council from 1999 to 2007 regarding developed countries’ incentives to transfer technology to LDCs sheds some light over the real efforts undertaken by the world’s industrialized main emitters. In it, Suerie Moon crudely concludes that definitional confusion exists around the terms “developed” and “technology transfer”, preventing members from exactly grasping who needs to provide incentives, and what for. Further, she adds that “many developed countries have never submitted a [technically mandatory annual] report... and among countries that did, submissions have largely been irregular.” Finally, she reports that only 22% of the 292 reported incentive programmes, involved technology transfer specifically targeting LDCs (Moon 9). The picture painted by this empirical analysis seems to leave no room for technological altruism, suggesting that without a legally binding mechanism, these best endeavors are at most rhetorical.

Many arguments are available in defense of a legally enforceable technology transfer mechanism. For instance, humanitarian and moral claims involving a “duty of assistance” by most fortunate members of a given order can quite self-evidently find resonance in such a goal. Conversely, the developmental need to reduce economic disparities and promote economic growth worldwide could also strengthen support for such a mechanism. Along this line, Hall and Helmers’ finding that because LDCs often lack any protection of intellectual property, firms are less likely to transfer technologies to them or invest in R&D further reinforces the call for legal regulation of technological transfers (Hall and Helmers 22-23).

Indeed, it seems that empirically, these countries are unable to attract, let alone generate, sustain and produce, technology transfers of modern high-tech innovations needed to address adaptation and mitigation policies to climate change. It is debatable whether the recent extension of the deadline for these members until July 2021 will actually aid or hurt their level of economic development. Following Hall and Helmers’ argument, in the absence of a legally binding technology transfer mechanism this extension further isolates LDCs from flows of EST transfers, negatively affecting their future prospects of “catching up” with developed and middle-income countries in terms of creation, deployment and diffusion of patented high-tech innovations.

b. Evidence from Middle-Income Countries: Limited Developments

While technology transfer incentives provided by TRIPS towards LDCs largely materialized as a failure, some middle-income WTO members, such as China and India, have indeed witnessed increased technology transfer as a result of effective and stable intellectual property protection. For instance Brazil, China and India have all noticed an “increase in green technology patents” in solar energy, fuel cells and wind energy, which can be seen as a positive effect of the current IPR regime on the transfer of ESTs (Hall and Helmers 22). However, closer analysis of China and India’s negotiation preferences and technological assets makes it clear that while they are effectively coping with the current IPR regime to a certain extent, they could achieve much larger benefits if they

were able to reform TRIPS provisions so as to allow compulsory licensing of clean, green, and environmentally sound technology.

Indeed, in “Climate Change: Technology Transfer or Compulsory License,” Lawrence Kogan reports reform proposals made by Chinese and Indian governments respectively, during recent intellectual property negotiations. For instance, in a recommendation adopted by the WIPO’s General Assembly in October 2007, India advocated the creation of “a global fund that could buy out IPRs of green technologies, and then distribute these technologies free, in a way that is similar to what is done for HIV/AIDS drugs” (Kogan 3). Essentially, this would be equivalent to compulsory or royalty-free licensing for developing countries willing to adopt and implement new, patented ESTs. However, it would still provide the incentives behind the protection of intellectual property to invest in innovations and R&D through the creation of a fund allowing investors to earn their returns.

Similarly, the Chinese government’s standardization administration proposed a system of national standards in which patented technologies would be included. A license agreement would be negotiated at a price significantly lower than normal royalties, effectively allowing for compulsory licensing of technologies required by national standards (such as environmental standards requiring patented ESTs, for example). Scholars such as Rishi Gupta further defend these considerations by stressing that in future negotiations, the WTO should use new scientific evidence to qualify GHGs emissions as circumstances of “extreme urgency” allowing for compulsory licensing of ESTs (Gupta 54). Only then, she argues, will countries such as China and India really be able to exploit their comparative advantage in EST generation, production and diffusion.

Figures of said advantage are provided by Kogan, who relates the findings of a Brookings Institute Study: “only one of the top ten solar photovoltaic (PV) producers in the world is American; only one of the top ten wind turbine producers is American [...] China and Japan host seven of the ten leading producers of photovoltaics. India’s Suzlon Corporation is a leading producer of wind turbines” (Kogan 9). Keeping these figures in mind, it seems apparent why strong countries within the WTO decided to draft a seemingly equal intellectual property regime with hidden asymmetrical commitments towards the protection and dissemination of knowledge and intellectual property. Legally enforceable technology transfer obligations or even allowing compulsory licensing of green technologies could cause industrialized countries to lose leadership in the generation and diffusion of new ESTs. They consequently incorporated appropriate institutional and legal safeguards against such a possibility within TRIPS.

The reasons why developing countries accepted to sign such an agreement in the first place are detailed by Steinberg and his “power-play” explanation (involving the WTO’s Single Undertaking Rule and pressures by the USTR), which reveals a great deal about the real power repartition behind the WTO’s seemingly consensual and egalitarian rules (Steinberg 339-369). This issue, however, goes beyond the scope of this analysis.

Empirical findings suggest that voluntary incentive mechanisms to transfer technologies to LDCs have largely failed in their mission. Strong middle-income countries such as China and India have been able to cope with TRIPS rules and even benefit from technology transfer, technological know-how and R&D investments. Yet, the benefits from compulsory licensing of patented green technologies, perhaps with compensation mechanisms such as the one proposed by India, could greatly benefit

climate change mitigation and adaptation technologies worldwide. Nevertheless, this would inevitably reduce industrialized countries' comparative advantage in the generation, production and diffusion of such innovations.

Conclusion

This analysis has allowed detailed inquiry of the ways in which the WTO's TRIPS Agreement affects developing countries' approaches to climate change adaptation and mitigation. Mainly, through legally binding patent and trade secrets protection, along with loosely defined and voluntary commitments to technology transfer, industrialized countries assure and maintain the monopoly of knowledge generation in their favor, while disproportionately affecting the poorest members within the organization. Extending these countries' transition periods to implement property protection under the TRIPS Agreement may increase the likelihood of past failures' reoccurrence by further delaying the creation of incentives for the transfer, creation, deployment and diffusion of patented environmentally sustainable technologies and innovations.

While evidence from strong middle-income countries such as China and India is more reassuring, the benefits from issuing compulsory licenses on green technologies – preferably along with a compensation mechanism maintaining incentives to invest in R&D such as the one proposed by India – could create a global intellectual property regime more conducive to effective climate change adaptation and mitigation by all countries, including LDCs. However, this would also inevitably alter industrialized countries' ability to monopolize intellectual property, and will thus be fiercely opposed. Only all once world leaders take full conscience that global warming is a situation of “extreme urgency” will compulsory licensing of patented ESTs occur, especially given the legal precedent created by the 2001 Doha Declaration.

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