

# INTERNATIONAL JOURNAL OF LAW MANAGEMENT & HUMANITIES

[ISSN 2581-5369]

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Volume 9 | Issue 2

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2026

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# Challenges of Technology Transfer in the TRIPS Agreement

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## ABSTRACT

*The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) was designed not only to standardise intellectual property protection but also to promote technology transfer to developing and least-developed countries. However, despite these objectives, the promise of equitable technology dissemination remains largely unfulfilled. This paper critically examines the legal framework governing technology transfer under TRIPS, focusing on the ambiguity and enforceability of Article 66.2, the tension between intellectual property protection and public interest under Articles 7 and 8, and the impact of TRIPS-Plus agreements in limiting developmental flexibilities.*

*The study argues that the obligations relating to technology transfer under TRIPS are predominantly aspirational rather than binding, due to vague language, weak monitoring mechanisms, and limited enforceability within the WTO dispute settlement system. Additionally, the growing prevalence of TRIPS-Plus provisions in bilateral and regional agreements further constrains the policy space available to developing countries.*

*By analysing treaty provisions, state practice, and scholarly perspectives, the paper highlights the structural imbalance within the TRIPS framework, which prioritises intellectual property protection over development objectives. It concludes by proposing clearer definitions, stronger accountability mechanisms, and a more development-oriented interpretation of TRIPS to ensure meaningful technology transfer and reduce global inequalities.*

## I. INTRODUCTION

The Agreement on Trade-Related Aspects of Intellectual Property Rights (“TRIPS”), adopted as part of the World Trade Organisation (“WTO”) in 1994, is the multilateral agreement on intellectual property (“IP”).<sup>3</sup> It was negotiated in the Uruguay Round and aimed at harmonizing minimum standards of protection of patents, copyrights, trademarks, and other intellectual properties. But TRIPS was more than an intellectual property treaty: it was incorporated into the trading system and thus tied IP enforcement to global market access. In the eyes of the

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<sup>3</sup> TRIPS Agreement, Annex 1C to the Marrakesh Agreement Establishing the WTO (1994).

developed world, TRIPS was a success in that it helped ensure that multinational firms could acquire and enforce their IP rights worldwide. For developing and least-developed countries (“LDCs”), though, TRIPS came in the form of a trade-off: in return for recognizing stronger IPRs, they would benefit from access to technologies owned predominantly by firms in the developed world. This was embedded in provisions of TRIPS, specifically Articles 7, 8, 66.2, and 67, which referred to technology transfer, public interest, and development.<sup>4</sup> However, almost three decades on, the promise of technology transfer still remains unfulfilled. Although TRIPS has clearly strengthened global IPR protection, it has failed to generate flows of proprietary technologies to the Global South. Legal uncertainty, weak enforcement, and conflicting interpretations of technology transfer have undermined its developmental objective. In addition, the spread of bilateral and regional trade arrangements with “TRIPS-Plus” provisions have undermined the few flexibilities available under TRIPS, further limiting developing countries’ policy space.

This article examines three key legal issues in TRIPS regarding technology transfer:

1. the uncertainty and enforceability of obligations under Article 66.2 against developed Members,
2. intellectual property protection versus technology dissemination tensions under Articles 7 and 8, and
3. the role of TRIPS-Plus agreements in limiting technology transfer flexibilities.

By examining treaty provisions, WTO case law, scholarly discourse, and state practice, the paper maintains that TRIPS technology transfer obligations are primarily aspirational. To restore the imbalance, reforms and better monitoring mechanisms are necessary.

## **II. TECHNOLOGICAL TRANSFER AND TRIPS**

Technology transfer has historically been a controversial topic in international economic law. Developing nations called for binding commitments in the United Nations Code of Conduct on Transfer of Technology Negotiations in the 1970s, but it failed.<sup>5</sup> TRIPS incorporated the topic partially after the Uruguay Round; TRIPS never defined what “technology transfer” is. Scholars and institutions have suggested diverse definitions. Harold Brooks defined technology transfer as “the process by which science and technology are diffused throughout human activity.”<sup>6</sup>

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<sup>4</sup> TRIPS arts. 7, 8, 66.2, 67.

<sup>5</sup> David M. Haug, *The International Transfer of Technology: Lessons That East Europe Can Learn from the Failed Third World Experience*, 5 *Harv. J.L. & Tech.* 209 (1992).

<sup>6</sup> Harold Brooks, “The Process of Diffusion of Technology in Human Activity,” cited in B.N. Pandey C Prabhakar Kumar Sinha, *Technology Transfer in TRIPS Agreement: Implications for Developing Countries*, 3 *Dehradun L.*

whereas Eric Hayden highlighted that a genuine transfer is only made when the recipient gains the ability to produce goods at comparable quality. World Intellectual Property Organization (WIPO) adopts a wide perspective and considers transfer as the sharing of ideas, skills, and actors.<sup>7</sup> For the purpose of the present study, we accept technology transfer to mean any process by which a party in one country gains access to the technology of another party in a second country and successfully learns how to absorb it into its production function. Technology transfer under TRIPS is stated to be both an objective and an obligation. Article 7 states that the protection of IPR should advance technological innovation and dissemination.<sup>8</sup> Article 8 allows Members to adopt measures to safeguard public interest if they are in accordance with TRIPS.<sup>9</sup> Article 66.2 imposes obligations on developed countries to encourage enterprises to transfer technology to LDCs, and Article 67 obliges them to offer technical and financial assistance. Together, these provisions establish a normative expectation that TRIPS must facilitate equitable access to technology.<sup>10</sup> However, the lack of definitional clarity, along with TRIPS' broader focus on protection for IPRs, has made these provisions difficult to enforce. The central legal controversies are about whether TRIPS establishes binding obligations on developed Members and to what extent developing nations can use public-interest measures to facilitate technology transfer.

### **III. AMBIGUITY AND ENFORCEABILITY OF ARTICLE 66.2**

Article 66.2 states: "Developed country Members shall provide incentives to enterprises and institutions in their territories with a view to promoting and encouraging technology transfer to least-developed country Members."<sup>11</sup> On the face of it, this seems a mandatory requirement, employing the word "shall." But the provision is not clear. It does not specify the type of incentives needed, the form of technology to be transferred, or the level of compliance required. From the perspective of the general rule of treaty interpretation in Articles 31 and 32 of the Vienna Convention on the Law of Treaties, the mandatory verb "shall," read together with the identification of least-developed countries as specific beneficiaries and the location of Article 66.2 in the part of TRIPS dealing with special and differential treatment, points toward an obligation rather than a mere recommendation. The real interpretative contest, therefore,

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<sup>7</sup> Agreement on Trade Related Aspects of Intellectual Property Rights arts. 7, 8, 66.2, 67, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299

<sup>8</sup> TRIPS Agreement art. 7.

<sup>9</sup> Id. art. 8.

<sup>10</sup> TRIPS Agreement arts. 66.2, 67.

<sup>11</sup> TRIPS Agreement art. 66.2, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1C, 1869 U.N.T.S. 299.

concerns the content and standard of that obligation, what counts as adequate “incentives” and “technology transfer” in practice rather than the existence of a duty in principle. Recourse to subsequent agreements and practice, including the Doha Ministerial Declaration and the reporting mechanism in the TRIPS Council, becomes necessary to clarify this open-textured language.

This mechanism, however, is weak. Reports are self-assessed, and the TRIPS Council cannot impose sanctions. No case has been brought before the WTO questioning a member’s failure to comply with Article 66.2, whose enforceability remains doubtful. Article 66.2 has been interpreted by some scholars as a “best efforts” clause and not a binding obligation, pointing to the lack of precision.

Under Article 31(3) of the Vienna Convention on the Law of Treaties, the annual reports submitted to the TRIPS Council, together with paragraph 11.2 of the Doha Declaration, qualify as “subsequent practice” and “subsequent agreement” of the parties in the application of Article 66.2.<sup>12</sup> Taken together, they confirm that WTO Members have understood 66.2 as an obligation requiring concrete implementation and monitoring, rather than merely as hortatory language.

Others argue that Doha reinforces its mandatory language as a positive duty, and that non-compliance could be challenged under WTO dispute settlement.<sup>10</sup> Political considerations and evidence problems discourage Members from filing for disputes. Failure to implement Article 66.2 strengthens technological disparity.

LDCs, although they have implemented TRIPS-mandated IP standards, receive little return in the form of new technologies. This imbalance shows the WTO law’s reciprocity principle that trade-offs are expected to benefit all states equally. The weak implementation of Article 66.2 shows how TRIPS’ developmental objectives are still rhetorical instead of real.

Addressing the ambiguities of Article 66.2 necessitates both institutional and interpretative reforms. Firstly, WTO Members must work on a clear definition of “technology transfer” that is more than technical assistance and clearly states the transfer of proprietary technologies, skills, and expertise that allow LDCs to innovate and absorb independently. Without a clear definition, developed Members can continue to characterize generic training or aid programs as fulfilment of their obligations.

The TRIPS Council should set minimum compliance standards, such as quantifiable financial commitments, the number of licenses granted, or cooperative undertakings with LDCs. These

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<sup>12</sup> Vienna Convention on the Law of Treaties art. 31(3), May 23, 1969, 1155 U.N.T.S. 331.

would help standardize reporting practices and allow for meaningful comparisons across Members. The existing mechanism of monitoring must be made better. Rather than depending on self-reporting only, the process could include peer review, as the WTO's Trade Policy Review Mechanism, and independent verification by agencies like WIPO or UNCTAD. This would enhance transparency and accountability. To add teeth to its enforceability, Article 66.2 can be clearly associated with WTO dispute settlement.

Panels and the Appellate Body can interpret it in accordance with Articles 7 and 8, thus adding strength to its developmental aspect. Even the prospect of adjudication would put more pressure on Members to conform in good faith. Given the decisive role of private enterprises in technology flows, developed countries should adopt incentive schemes for firms, including tax relief, subsidies, or credit guarantees, to promote the licensing of technologies to LDCs. Greater coordination with the WIPO Development Agenda could improve coherence between multilateral institutions and ensure that LDCs receive targeted, development-oriented support. Finally, the adoption of a Technology Transfer Index, ranking developed Members on the effectiveness of their initiatives, could introduce reputational pressure and encourage more genuine efforts to implement Article 66.2. Together, these measures would transform Article 66.2 from a largely rhetorical commitment into a more concrete and enforceable obligation, aligning TRIPS more closely with the WTO's broader developmental objectives.

#### **IV. CONFLICT BETWEEN PROTECTION OF IPR AND TECHNOLOGY TRANSFER (ARTICLES 7 AND 8)**

Article 7 underlines that protection of IPR must promote technological innovation, transfer, and dissemination in a manner that promotes social and economic well-being. Article 8 allows Members to take measures for protecting public health and preventing anti-competitive practices in the marketplace, as long as these are consistent with TRIPS. Both these provisions reflect the balance between developed nations (emphasizing stronger IPRs) and developing nations (seeking policy space for the public interest). The most visible conflict arises in the pharmaceutical industry. Patent protection tends to drive up drug costs, making them unaffordable in developing nations. In the HIV/AIDS epidemic, nations such as South Africa tried to use compulsory licensing to produce affordable generics. Pharmaceutical companies and developed nations claim that stringent IP protection is needed for innovation. The Doha Declaration on TRIPS and Public Health (2001) clarified that Members have the right to use

TRIPS flexibilities, including compulsory licensing, to protect public health.<sup>13</sup> Yet disputes over interpretation persist, most recently during the COVID-19 pandemic, when India and South Africa led calls for a waiver of certain TRIPS obligations to facilitate vaccine access.<sup>14</sup> At the Twelfth Ministerial Conference (MC12) in June 2022, WTO Members adopted a limited TRIPS Decision easing the use of patent-related subject matter for COVID-19 vaccines. However, efforts to extend this decision to diagnostics and therapeutics did not achieve consensus, and no extension was agreed as of 2024. This limited outcome underscores how contested the interpretation of TRIPS flexibilities remains in practice. Though no WTO case has interpreted Articles 7 or 8 directly, the Appellate Body's argument in *US-Shrimp Turtle* settled that preambular objectives can shape treaty interpretation.<sup>15</sup> Articles 7 and 8, while constitutionally broad, can direct panels on how to balance IPR protection with development interests. However, the WTO Appellate Body is currently non-functioning, with appeals either stalled or managed under interim mechanisms such as the Multi-Party Interim Appeal Arbitration Arrangement (MPIA).<sup>16</sup> This institutional reality limits the prospects of obtaining authoritative appellate guidance on the scope of Articles 7 and 8 in the near term). However, they lack operational detail; their application depends on political negotiation rather than adjudication. IPR defenders argue that they encourage voluntary licensing and foreign direct investment, indirectly promoting technology transfer. Critics argue that IPRs tend to entrench monopolies, restricting diffusion, especially in low-income nations with weak bargaining power. Peter Yu recommends interpreting Articles 7 and 8 pro-developmentally, using them as offsets to excessive IP enforcement.<sup>17</sup> The conflict between IPR protection and technology transfer shows the structural imbalance of TRIPS. Although its language recognizes development objectives, its operating provisions disproportionately benefit rights holders.

In the absence of a strong interpretative reference to Articles 7 and 8, TRIPS will turn into an instrument of exclusion instead of inclusion. The conflict between IPR protection and technology transfer can be overcome by operationalizing Articles 7 and 8. WTO panels must interpret them as binding interpretative tools, not aspirational clauses. A Ministerial Declaration could reassure that action such as compulsory licensing or parallel imports, when taken for public health or development purposes, would be in line with TRIPS. Flexibilities should be

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<sup>13</sup> WTO, Doha Declaration on the TRIPS Agreement and Public Health, WT/MIN(01)/DEC/2 (Nov. 14, 2001).

<sup>14</sup> WTO, Waiver from Certain Provisions of the TRIPS Agreement for the Prevention, Containment and Treatment of COVID-19, IP/C/W/669 (Oct. 2, 2020).

<sup>15</sup> Appellate Body Report, *United States – Import Prohibition of Certain Shrimp and Shrimp Products*, WTO Doc. WT/DS58/AB/R (Oct. 12, 1998).

<sup>16</sup> Andrés M. González, *The Multi-Party Interim Appeal Arbitration Arrangement*, 17 *Global Trade & Customs J.* 420 (2022).

<sup>17</sup> Peter K. Yu, *A Tale of Two Development Agendas*, 35 *Ohio N.U. L. Rev.* 465 (2009).

further extended beyond pharmaceuticals to digital and green technology. More transparent rules for compulsory licensing, as well as encouragement of joint R&D and patent pools, would strike a balance between innovation and access. Lastly, WTO Members must ensure that bilateral “TRIPS-Plus” agreements do not weaken the protections in Articles 7 and 8.

## **V. TRIPS-PLUS AGREEMENTS AND SHRINKING FLEXIBILITIES**

The WTO developed nations increasingly negotiate bilateral and regional trade agreements with “TRIPS-Plus” provisions. These provisions include obligations such as data exclusivity, extended patent terms, and restrictions on compulsory licensing. These provisions tend to go beyond TRIPS and limit developing countries’ flexibilities. TRIPS-Plus obligations worsen the technology transfer gap by further reinforcing monopolistic rights. For example, data exclusivity measures can cause generic entry to be delayed even after patent expiry, limiting access to affordable medicines.<sup>18</sup> Patents of longer durations keep technologies under monopoly control for extended periods, slowing diffusion.

The spread of TRIPS-Plus agreements weakens the coherence of the multilateral system. While TRIPS has incorporated flexibilities in development, bilateral agreements often curtail them, leaving developing nations with less policy space. This dual regime creates a hierarchy under which dominant states use stronger standards through trade leverage, weakening multilateral commitments towards technology transfer. Pedro Roffe and David Vivas said that TRIPS-Plus agreements significantly restrict developing countries’ ability to frame IP regimes with a view to development, thereby undermining Articles 7, 8, and 66.2 of TRIPS. Others highlight that TRIPS-Plus deals entrench asymmetries by prioritizing rights holders’ interests over developmental needs.

To mitigate the restrictive effects of TRIPS-Plus agreements, WTO Members could adopt safeguards ensuring that bilateral and regional trade deals do not undermine the flexibilities embedded in TRIPS. A multilateral framework could require consistency reviews so that provisions like data exclusivity or extended patent terms cannot erode Members’ rights under Articles 7, 8, and 66.2. Developing nations should also negotiate for explicit “development clauses” in free trade agreements, preserving compulsory licensing and public-health exceptions. Finally, greater reliance on South–South cooperation and technology-sharing partnerships could reduce dependence on restrictive TRIPS-Plus regimes.

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<sup>18</sup> Duncan Matthews, TRIPS Flexibilities and Access to Medicines in Developing Countries: The Problem with Technical Assistance and Free Trade Agreements, 27 *Eur. Intell. Prop. Rev.* 420 (2005).

## VI. CRITICAL EVALUATION AND REFORMS

A critical evaluation of the TRIPS Agreement reveals that its provisions on technology transfer remain ambiguous, weakly institutionalized, and largely aspirational. Despite their developmental rhetoric, Articles 7, 8, and 66.2 have not translated into meaningful flows of technology from developed to developing countries. Instead, the structure of TRIPS has tilted decisively in favor of intellectual property protection, with its developmental objectives relegated to the margins.

The first and most pressing challenge lies in the absence of a clear and operational definition of “technology transfer.” The current ambiguity enables developed Members to conflate genuine transfers of proprietary knowledge with technical assistance or training programs of limited developmental value. Establishing a functional and uniform definition one that captures not only the delivery of knowledge but also the recipient’s ability to absorb, adapt, and innovate would prevent the dilution of Article 66.2 obligations.

Second, the implementation of Article 66.2 suffers from the absence of objective benchmarks. The reporting mechanism before the TRIPS Council is descriptive, self-assessed, and devoid of measurable indicators. Introducing quantifiable standards such as earmarked funding, the number of licensing agreements, or the scale of collaborative R&D projects would strengthen accountability. Independent review mechanisms, perhaps undertaken jointly by the TRIPS Council and WIPO or UNCTAD, could provide credibility and transparency.

Third, there is the issue of enforceability. The reluctance of Members to test Article 66.2 obligations before the WTO dispute settlement system has rendered the provision almost non-justiciable. Clarifying that non-compliance can indeed be challenged under WTO law would inject much-needed accountability. Even if remedies are prospective, the mere possibility of legal scrutiny would compel Members to approach their obligations with greater seriousness.

Fourth, the integration of the TRIPS framework with the WIPO Development Agenda would enhance coherence across international institutions. WIPO’s Development Agenda already emphasizes access to knowledge, public interest safeguards, and balanced IP enforcement. Greater institutional coordination would help ensure that TRIPS implementation is not divorced from developmental realities.

Fifth, a recalibration of Articles 7 and 8 as interpretative tools is necessary. These provisions should not remain aspirational rhetoric but must serve as guiding principles in treaty interpretation. By treating them as balancing clauses, WTO panels and the Appellate Body could ensure that IP enforcement does not eclipse broader public interest objectives such as

public health, innovation diffusion, and socio-economic development.

Sixth, the rise of TRIPS-Plus commitments in bilateral and regional trade agreements threatens to erode the already limited policy space available to developing countries. Multilateral rules should be developed to guarantee that such agreements do not undermine TRIPS flexibilities. At the very least, WTO Members could agree on a principle of “TRIPS-consistency” for bilateral treaties, thereby safeguarding compulsory licensing and parallel importation as legitimate public-interest tools.

Finally, the promise of technology transfer should not rely solely on the goodwill of developed Members. Strengthening South-South cooperation offers an alternative model. Partnerships among developing countries, whether through pooled procurement of medicines, collaborative R&D initiatives, or regional technology-sharing mechanisms, could reduce dependence on Northern technologies and promote endogenous innovation capacity. Taken together, these reforms underscore the need to rebalance TRIPS from a system of rights enforcement to one of reciprocal obligations. Without such recalibration, the Agreement risks perpetuating asymmetries by privileging private monopolies over global developmental imperatives. A more balanced interpretation and implementation of TRIPS would not only fulfill the original bargain of the Uruguay Round but also enhance the WTO’s legitimacy in an increasingly divided global economy.

## **VII. CONCLUSION**

The TRIPS Agreement represented in linking intellectual property to trade, but its promise of technology transfer has not been realized. Article 66.2 remains undermined by ambiguity and lack of enforcement, while Articles 7 and 8, though aspirational, have not effectively counterbalanced the monopolistic tendencies of TRIPS. The rise of TRIPS-Plus agreements has further curtailed flexibilities, exacerbating the imbalance.

Unless TRIPS is reinterpreted and reformed through a development-oriented lens, it risks perpetuating global inequality by protecting private monopolies without ensuring the diffusion of knowledge. A stronger commitment to technology transfer is not only a legal necessity but also central to the legitimacy of the multilateral trading system. For the WTO to remain relevant in a world increasingly shaped by technological divides, its IP framework must deliver on its promise to promote both innovation and equitable access.

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