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Technology transfer in sustainable trade of tropical timber: the contribution of the International Tropical Timber Organization between State sovereignty and international protection of forests

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1. *Introduction*

Forests play a fundamental role for the environment, population and economy. They represent some of the richest biological areas on earth, as well as providing food, renewable raw materials, and livelihoods for millions of people.

If some data are taken into account, it is worth considering that forests cover 31% of the global land surface.[1] About half of forests at the international level is relatively intact and more than a third is primary forest (i.e. naturally regenerated forests of native species, where there are no visible indications of human activity and ecological processes are not significantly disturbed).[2] More than half of the world's forests are located in just five States (Russian Federation, Brazil, Canada, USA and China) and two-thirds (66%) of the forests are located in ten States.[3] An estimated 420 million hectares of forest have been lost due to conversion to "other land uses",[4] although the rate of deforestation has decreased over the last three decades. The rate of deforestation was estimated at 10 million hectares per year between 2015 and 2020, resulting in a slender decrease from 16 million hectares per year registered in the 1990s.[5] Taking into account the only

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[1] FAO, UNEP, *The State of the World's Forests 2020*, Rome, 2020, p. xvi, available at https://www.fao.org/3/ca8642en/ca8642en.pdf.

[2] *Ibidem*, p.114.

[3] P.Y. BERNIER, D. PARÉ, G. STINSON, S.R.J. BRIDGE, B.E. KISHCHUK, T.C. LEMPRIÈRE, E. THIFFAULT, B.D. TITUS, W. VASBINDER, *Moving beyond the concept of "primary forest" as a metric of forest environment quality*, in *Ecological Applications*, 2017, pp. 349-354.

[4] FAO, UNEP, cit., p. xvi.

[5] United Nations, *Deforestation has slowed down but still remains a concern, new UN report reveals*, UN News, 21 July 2020, available at https://news.un.org/en/story/2020/07/1068761.

area of primary forest worldwide, it has decreased by more than 80 million hectares since 1990.[6] The phenomenon of deforestation is mainly driven by three economic needs: the direct causes of deforestation are agricultural expansion, timber extraction (including logging or harvesting of wood for domestic fuel or charcoal) and infrastructure expansion such as road building and urbanization.[7] Rarely a single direct cause for deforestation is noticeable: the case that several processes occur simultaneously or sequentially to cause deforestation.

When it comes considering timber extraction, it is worth noting that this represents a trend of particular concern in the market economy: over the last 20 years, global timber consumption has increased by 1.1% per year, due to the growing urbanization and global building needs.[8] Over the next 30 years, several research institutes foresee that timber consumption will increase by 3.1% per year, as a result of three main phenomena: urbanization, decarbonization and increased construction.[9]

The aim of this paper is to consider the perspective of sustainable trade in tropical timber through the prism of technology transfer. After a brief analysis of the legal framework on the issue of forest protection in international law, the paper will firstly describe the role of the International Tropical Timber Organization (hereinafter, also referred to ITTO), as the leading international organization working to protect the sustainable extraction of timber and hence its trade at global level. Subsequently, attention will be given to the role of technology transfer, both through the ITTO and by means of cooperation processes aimed at fostering sustainable trade in tropical timber. The paper will conclude by providing an assessment of the impact of technology transfer in relation to this legal regime in order to understand whether technology transfer is the right instrument to balance the need to protect tropical forests with the economic exploitation of this natural resource at the international level.

2. *The protection of forests in international law towards equitable use*

[6] *Ivi*.
[7] FAO, UNEP, cit., pp. xvi-xvii.
[8] On this point, see the data provided by Global Forest Watch, available at https://data.globalforestwatch.org/search?q=timber.
[9] Gresham House, *Global Timber Outlook 2020*, London, 2020, p. 3, available at https://greshamhouse.com/wp-content/uploads/2020/07/GHGTO2020FINAL.pdf; NASA Earth Observatory, *Causes of Deforestation: Direct Causes*, available at https://earthobservatory.nasa.gov/features/Deforestation/deforestation_update3.php

Universal protection of forests is not enshrined in international treaty law; indeed, States has been so far unable to adopt agreements on this subject notwithstanding scientific and civil society efforts to that end. However, the issue of forest protection in the perspective of international law is dominated by two great, antithetical principles: that of permanent sovereignty over natural resources and that of equitable use of natural resources.

The first principle stems from UN General Assembly Resolution 1803(XVIII) of 1962, on Permanent Sovereignty over Natural Resources.[10] This resolution emphasizes the principle of the sovereign equality of States in international relations, putting ecological issues in a subordinate perspective under «the interest of their national development and of the well-being of the people of the State concerned».[11] This view of exclusive sovereignty over natural resources is reiterated in Article 5, which recognizes the right of UN Member States that the «free and beneficial exercise of the sovereignty of peoples and nations over their natural resources must be furthered by the mutual respect of States based on their sovereign equality».[12] Generally, permanent sovereignty over natural resources can be defined as legal, governmental control and management authority over natural resources, as a particular side of the application of the self-determination principle.[13] Of the same opinion is the provision contained in the two Covenants of New York of 1966, respectively in Article 25 of the International Covenant on Civil and Political Rights (ICCPR) and Article 47 of International Covenant on Economic Social and Cultural Rights (ICESCR), which attribute to people the right to fully enjoy States' own natural resources. The juridical content of this principle is therefore aimed at qualifying the right of every State to freely possess and exercise complete and permanent sovereignty over all wealth, natural resources and economic activities.

[10] UNGA, *Permanent sovereignty over natural resources*, General Assembly Resolution 1803 (XVII), 17 UN GAOR, Supp. (No. 17) 15, UN Doc. A/5217, 14 December 1962.
[11] *Ibidem*, Article 1.
[12] *Ibidem*, Article 5.
[13] Australian Human Rights Commission, *Indigenous Peoples Permanent Sovereignty Over Natural Resources*, Lecture by Professor Dr. Erica-Irene A. Daes at the National Native Title Conference, Adelaide, 3 June 2004, available at https://humanrights.gov.au/about/news/speeches/indigenous-peoples-permanent-sovereignty-over-natural-resources.

The second and antithetical principle, i.e. the equitable use of natural resources, constitutes a fundamental value in international environmental law. It finds its legal crystallization in Principle 21 of the Stockholm Declaration of the United Nations Conference on the Human Environment and in Principle 2 of the Rio Declaration on Environment and Development, which identically affirm that «States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction».[14] From this perspective, State sovereignty finds an effective limitation concerning the economic activities that the State conducts, not being able to have full discretion in the economic exploitation of their resources to the point of causing a transboundary environmental damage to the territory of another State. The principle was also recognized by some international consistent case-law, such as the *River Oder* case, where the Permanent Court of International Justice stated that «[A] community of interests in a navigable river [that traverses or separates the territory of more than one State] becomes the basis of a common legal right, the essential features of which are the perfect equality of all riparian States in the use of the whole course of the river and the exclusion of any preferential privilege of any one riparian State in relation to the others».[15] Moreover, the principle has found further applications in some decisions of the International Court of Justice (ICJ), where the Court has noted the link between the fair and sustainable use of natural resources and the fair use of shared resources. These latter should be understood to mean the set of natural resources whose interest in their exploitation implies a coordinated and

[14] United Nations, *Stockholm Declaration of the United Nations Conference on the Human Environment*, UN Doc A/CONF.48/14/Rev.1, 3, UN Doc A/CONF.48/PC/6, Principle 21, and *Rio Declaration on Environment and Development*, UN Doc A/CONF.151/5/Rev.1, UN Doc A/CONF.151/26/Rev.1 Vol. 1, Annex I, Principle 2. In both the Principles the phrasing is the same. On this point, see A. HOOKER, *The International Law of Forests*, in *Natural Resources Journal*, Vol. 34, Issue 4, 1997, p. 835.

[15] Permanent Court of International Justice, *Case relating to the Territorial Jurisdiction of the International Commission of the River Oder*, United Kingdom, Czechoslovakia, Denmark, France, Germany, Sweden v. Poland, Judgment No. 16, 10 September 1929, ser.A, para. 74.

impartial assessment by all parties enjoying their possession, in order to understand the circumstances for the sustainable use of these assets.[16]

The meaning accorded to the equitable use of natural resources can be agreed upon in the definition of a minimum threshold of cooperation for the implementation of international equitable use of these resources. The cooperative dimension is recognized as a function to the achievement of environmental protection objectives that can be universally acknowledged by the international community, primarily with the aim of avoiding environmental damage that could have repercussions at the global level. International cooperation is thus considered as a fundamental tool for the protection of these resources and their equitable management through a shared perspective. The equitable use of natural resources can therefore be achieved through «bilateral or multilateral negotiations among interested States establishing commissions for the exchange of information, programmes for joint research, common environmental standards, and joint management».[17] In this need for international cooperation, the equitable use of natural resources represents «the process of implementing uses with an equitable approach in order to avoid harm to and to reach consensus with interested States».[18] The principle is therefore a legal value to be placed in counterbalance to that of permanent sovereignty over natural resources. In addition, the customary nature that is recognized to the principle of equitable use of natural resources is proven by the same legal nature of international

[16] This is confirmed by the ICJ itself, which in the 1997 *Gabčíkovo-Nagymaros* case ruled that the legal nature of the principle presupposed a «community of interests» applicable to international navigable watercourses found further application «for non-navigable uses of international watercourses as well, as evidenced by the adoption of the Convention of 21 May 1997 on the Law of the Non-Navigational Uses of International Watercourses by the United Nations General Assembly» (at para. 85). On this point, the Court argued that exclusive control of the Danube - recognized as a shared resource on the basis of the 1977 Bilateral Cooperation Treaty - deprived Hungary «of its right to an equitable and reasonable share of the natural resources» of that River (*ivi*). On this point, it must also be considered the application of the principle in relation to the ICJ's rulings about maritime delimitations, such as the *Continental Shelf* case of 1985 (Federal Republic of Germany v. The Netherlands) and the case concerning the *Maritime Delimitation and Territorial Questions between Qatar and Bahrain* (Qatar v. Bahrain) of 2001. In these circumstances, the Court has affirmed that the equitable use of water resources implies the application of a general principle of international law concerning equity, with the specific circumstances based on a case-by-case analysis aimed to consider the achievement of an equitable result for the parties to the dispute (*Maritime Delimitation and Territorial Questions between Qatar and Bahrain*, in part. paras 229, 231-232).
[17] L. DEL CASTILLO-LABORDE, *Equitable Utilization of Shared Resources*, in *Max Planck Encyclopedia of Public International Law*, January 2010, Lett. C, pt. 1(15).
[18] *Ivi*.

environmental law, aimed at considering interstate cooperation as the *conditio sine qua non* to achieve internationally recognized environmental objectives.

Consequently, it is worth considering how these two principles significantly influence the context of international law of forests. The first international document focusing on the international protection of forests is the Statement of Principles for the Sustainable Management of Forests.[19] In the document, the legal tension that accumulates between the two principles is evident. Article 2(a) recognizes that «States have the sovereign and inalienable right to utilize, manage and develop their forests in accordance with their development needs and level of socio-economic development and on the basis of national policies consistent with sustainable development and legislation, including the conversion of such areas for other uses within the overall socio-economic development plan and based on rational land-use policies».[20] Conversely, Article 3(a) of the Declaration of 1992, states that «National policies and strategies should provide a framework for increased efforts, including the development and strengthening of institutions and programmes for the management, conservation and sustainable development of forests and forest lands».[21] Generally, this non-binding instrument points out a general proclivity of the international community towards recognition in the establishment of common protection standards in international environmental law concerning forest protection. However, the attempt to erode State sovereignty in order to protect forests clashes with the very logic of exclusive control of this natural resource and its use on the basis of full State discretion. The substantial protectionist dimension underlined by the Declaration also seems to be proven by the circumstances in which it was adopted. In fact, during the 1992 Rio de Janeiro Conference, where the Statement was approved, the negotiation of the document was complicated by the demands of developing countries belonging to the G77, which promoted an increase in international aid to conserve forests. The developed countries resisted these demands, resulting the final document in a compromise between the two opposing positions.

[19] UNGA, *Report of the United Nations Conference on Environment And Development*, Annex III, *Non-legally binding authoritative statement of principles for a global consensus on the management, conservation and sustainable development of all types of forests*, A/CONF.151/26 (Vol. III), 3-14 June 1992, Rio De Janeiro.
[20] *Ibidem*, Article 2(a).
[21] *Ibidem*, Article 3(a).

If the 1992 Statement confronted for the first time the international community with the problem of forests, this issue has been further debated, although it has not succeeded in leading to the adoption of legally binding documents. Proof of this is the UN Forest Instrument, a non-binding document adopted in 2016 with UN General Assembly Resolution 70/199.[22] It takes up what was already stated in the 1992 Declaration, placing the dimension of forest protection in a functional logic within the objectives of the Agenda 2030. Indeed, while the UN Forest Instrument acknowledges that «the instrument is voluntary and non-legally binding[23]» it dwells on the need to increase international convergence on forest management «as a dynamic and evolving concept, […] to maintain and enhance the economic, social and environmental values of all types of forests, for the benefit of present and future generations».[24] An attempt to reconcile economic and environmental concerns on the issue can also be tracked in Article 6(g), which states the objective to «further develop and implement criteria and indicators for sustainable forest management that are consistent with national priorities and conditions»,[25] or even to «encourage recognition of the range of values derived from goods and services provided by all types of forests and trees outside forests, as well as ways to reflect such values in the marketplace, consistent with relevant national legislation and policies».[26] Part VI of the document also considers how forest protection, although settled within the framework of national legislative policies, must necessarily confront an international perspective aimed at strengthening international cooperation on this matter. The primary aim is to achieve tangible results in forest protection through concerted action and collective monitoring processes involving the largest number of States.[27] With regard to the document in question, it should be recognized that despite its non-binding nature, it has provided to hinge the logic of sustainability underlying the Sustainable Development Goals (SDGs) of the United Nations, trough the definition of a framework to harmonize the work of the international community in the field of sustainable forest management. What

[22]United Nations, *United Nations Forest Instrument Resolution*, A/RES/70/199, 16 February 2016, available at https://www.un.org/esa/forests/wp-content/uploads/2018/08/UN_Forest_Instrument.pdf.
[23] *Ibidem*, Article 2(a).
[24] *Ibidem*, Article 4.
[25] *Ibidem*, Article 6(g).
[26] *Ibidem*, Article 6(j).
[27] *Ibidem*, see Part VI of the Resolution, *infra*.

must be considered is therefore the holistic approach that is privileged, recognizing the interconnection between the protection of environmental heritage, economic development needs and social demands.

Finally, the issue of deforestation in relation to the sustainable exploitation of natural resources was discussed on 2 November 2021 at COP26 under the auspices of the United Nations Framework on Climate Change (UNFCCC). On the second day of negotiations, 141 States that own almost 91% of the world's forests announced the *Glasgow Leaders' Declaration on Forests and Land Use.*[28] Despite its non-binding nature, it is interesting to note that the negotiators recognized the collective commitment to conserving forests and other terrestrial ecosystems[29] and the need «[to] facilitate trade and development policies, internationally and domestically, that promote sustainable development, and sustainable commodity production and consumption, that work to countries' mutual benefit, and that do not drive deforestation and land degradation».[30]

To sum up, it is necessary to consider that the equitable approach advocated in these soft law instruments has not subsequently led to the adoption of further legally binding instruments at the multilateral level that would increase State intervention in the dimension of international forest protection. The legal consequence of this partial protection process is therefore a general affirmation of the moral need for international cooperation on forests, but an evident fragmentation in the plans of environmental actions at regional and national levels.[31] Nevertheless, it is the very will of States that has led to the only *ad hoc*

[28] UNFCCC, *Glasgow Leaders' Declaration on Forests and Land Use*, 2 November 2021, available at https://ukcop26.org/glasgow-leaders-declaration-on-forests-and-land-use/.
[29] *Ibidem*, pt. 1.
[30] *Ibidem*, pt. 2.
[31] By way of example, it is worth considering the exploitation policies carried out by the Brazilian Government led by the President Bolsonaro where deforestation in Brazil's Amazon rainforest has hit its highest level in over 15 years (data available at https://www.globalforestwatch.org/dashboards/country/BRA/). A report by Brazil's Space Research Agency (INPE) found that deforestation increased by 22% in the sole year of 2021. An opposite point of view on the issue could be offered, on a regional scale, by the European Union commitment on the issue, which published the *New EU Forest Strategy for 2030* on 16 July 2021[SWD(2021) 651 final - SWD(2021) 652 final], committing the EU to plant 3 billion more trees by 2030 with the aim of increasing the forest and trees covering the EU, increasing the resilience of forests and their role in reversing biodiversity loss, and mitigating and helping people adapt to climate change. All European citizens will be able to follow and track the planting of trees through a website and an interactive online map with an integrated "Map-My-Tree" counter developed by the European Commission together with the European Environment Agency. The commitments and actions proposed in the Strategy will

legally binding agreement on the subject, concerning the protection of tropical forests.

3. *The International Tropical Timber Agreement*

The only conventional regime about forests is the International Tropical Timber Agreement (ITTA) signed in 1983 at the United Nations Tropical Timber Conference in Geneva.[32] This agreement anchors the primary objective of creating a framework for cooperation between tropical timber consuming and producing countries, improving market efficiency and promoting the sustainable use of this resource. The 1983 Agreement was updated by the 1994 ITTA, that operated from 1 January 1997 to 6 December 2011 and definitely by the 2006 ITTA that entered into force on 7 December 2011 and is still effective.[33] With regard to the 2006 ITTA, Article 2 states that tropical timber «means tropical wood for industrial uses, which grows or is produced in the countries situated between the Tropic of Cancer and the Tropic of Capricorn».[34] The definition encompasses logs, sawnwood, veneer sheets and plywood, with the intention of broadening the scope of this resource in relation to the various economic uses that can be derived from its processing. The same Article also focuses on the definition of «sustainable forest management», whose a teleological connotation is given, i.e. in line with «policy documents and technical guidelines[35]» resulting from forest protection activities.

Article 3 foresees as central to the achievement of the Agreement's objectives the role of the International Tropical Timber Organization (ITTO), a legal entity already established by the 1983 Agreement and considered as the main administrative and supervisory body to implement the provisions of the

contribute to achieving the EU's target of reducing greenhouse gas emissions by 55% by 2030 as set out in the European Climate Act (European Commission, *'Fit for 55': delivering the EU's 2030 Climate Target on the way to climate neutrality*, COM(2021) 550 final, Brussels, 14 July 2021). On this point, see C. M. PONTECORVO, *Il 'regime' internazionale per la protezione delle foreste*, 2012, Naples, *passim*.

[32] UNCTAD, *International Tropical Timber Agreement*, TD/TIMBER/11/REV.1, 1983, available at https://www.itto.int/direct/topics/topics_pdf_download/topics_id=1814&no=0&disp=inline.

[33] UNCTAD, *International Tropical Timber Agreement,* TD/TIMBER.3/12, 2006, available at https://www.itto.int/direct/topics/topics_pdf_download/topics_id=3363&no=1&disp=inline.

[34] *Ibidem*, Article 2(1).

[35] *Ibidem*, Article 2(3).

Agreement.[36] The ITTO operates through a Council, established on the basis of Article 6,[37] and several commissions and other subsidiary bodies provided for in Article 26. The Council's work is managed in conjunction with several committees within the Organization, which are: the Committee on Forest Industry; the Committee on Economics, Statistics and Markets; the Committee on Reforestation and Forest Management; and the Committee on Finance and Administration.

The membership-system of the Organization is particularly worth mentioning since it is not characterized by the usual "one State one vote" principle. In fact, 69 States are parties to this Agreement, representing the 80% of the world's tropical forests and 90% of the international trade in tropical timber. Article 10 provides for the distribution of votes in the Council, with a division of 1000 votes among tropical timber producers and 1000 votes for consumers. Specifically, 400 votes are distributed equally among the three tropical timber producing regions (Asia, Africa and Latin America), a further 300 votes are allocated among producer members on the basis of their respective tropical forest resources, and the remaining 300 votes are spread among Member States in proportion to the average value of their respective net exports of tropical timber during the most recent three-year period of reallocation of votes in the Council. On the consumer side of tropical timber, provision is made in paragraphs 4 to 6 of the same Article for an initial distribution of 10 votes to each consumer member, with the remaining votes distributed among them in proportion to the average value of their net imports of tropical timber during the five-year period in which votes are reallocated.[38]

Concerning the ITTO's activity to protect forest heritage, Article 25 states that «The Council shall establish criteria for approving projects and pre-

[36] *Ibidem*, Article 3(1-2) states «1. The International Tropical Timber Organization established by the International Tropical Timber Agreement, 1983 shall continue in being for the purposes of administering the provisions and supervising the operation of this Agreement. 2. The Organization shall function through the Council established under Article 6, the committees and other subsidiary bodies referred to in article 26 and the Executive Director and staff». Moreover, para. 3 of the same article sets out the headquarter of the ITTO in Yokohama (Japan).

[37] *Ibidem*, Article 6 (1-2): «1. The highest authority of the Organization shall be the International Tropical Timber Council, which shall consist of all the members of the Organization. 2. Each member shall be represented in the Council by one representative and may designate alternates and advisers to attend sessions of the Council».

[38] P. CULLET, *Differentiation*, in L. RAJAMANI, J. PEEL, *The Oxford Handbook of International Environmental Law*, 2021, Oxford, p.329.

projects, taking into account *inter alia* their relevance to the objectives of this Agreement and to priority areas for work or thematic programmes, their environmental and social effects, their relationship to national forest programmes and strategies, their cost effectiveness, technical and regional needs, the need to avoid duplication of efforts, and the need to incorporate lessons learned».[39] These projects are to be understood as proposals by Member States and the Executive Director of the Organization that contribute to the achievement of the objectives of the Agreement and in the identification of priority areas on programmatic issues that are identified by the Action Plans approved by the Council under Article 24, regarding the policy work of the Organization. Hence, project activities are relevant to policy direction in the work of the Organization, taking into account the environmental and social effects of particular economic activities, their relationship to national forest protection programmes and strategies, their cost-effectiveness and the technical and regional needs that may arise from economic timber harvesting activities. Project monitoring is specifically provided for in paragraph 3 of the same Article. As part of the monitoring functions of the body, these include «the development and preparation of guidelines, manuals, studies, reports, basic communication and outreach tools, and similar work identified in the Organization's action plan».[40]

To sum up, the ITTO is a subject of international law that, through the functional competences conferred on it on the basis of the relevant Agreement, promotes interstate cooperation on sustainable forest trade. The ITTO represents the only international organization that is competent *ratione materiae* to operate in the field of forest conservation, which, as seen, represents a fragile area within international environmental law. It therefore contributes to strengthening environmental governance to address illegal deforestation processes and the related trade in tropical timber, which can cause negative externalities both within legally commercial processes both in terms of damage to the natural environment and thus to the forest heritage, biodiversity and, in some specific regions, to the indigenous communities living in these territories.

4. *ITTO's technology transfer mechanisms*

[39] UNCTAD, *International Tropical Timber Agreement,* cit. *supra* note 34, Article 6(2).
[40] *Ibidem,* Article 24 (3).

In international law, technology transfer can be defined as «the effective dissemination of technology beyond the lifecycle of particular projects»,[41] considering that «capacity-building, training, and professional human resource development are all elements of technology transfers into recipient countries that take place on longer timescales, so that developing countries and LDCs can possess the capabilities to pursue sustainable development».[42] Generally, technology transfer in international environmental law is to be understood as an instrument of international cooperation to further ends collectively recognized by the community of States. It finds its first mention in 1992 Rio Declaration where it figures out its programmatic nature within international environmental law. In particular, Principle 9 of the Declaration affirms the need to consider technology transfer and the exchange of technological and scientific knowledge as functional means of cooperation for the pursuit of sustainable development. In addition, the Declaration establishes an action program aimed at outlining the main profiles of international cooperation to achieve sustainable development *uti universi*: this is Agenda 21, a programmatic document that refers to technology transfer at point 16 (Section II), which refers to environmentally-sound technologies, especially in biotechnology and at point 31 (Section III), which instead mentions the role of scientific and technological cooperation at the international level.[43] The programmatic and inherently operational perspective that typifies technology transfer in environmental matters has thus witnessed its refinement with the Sustainable Development Goals (SDGs) contained in the Agenda 2030.[44] In particular, Goal 17 makes reference to the role of international cooperation in its various implications, thus considering the purpose to promote the dissemination of environmentally friendly technologies on favorable terms towards developing countries.[45]

Three are the main characteristics of technology transfer in international environmental law. Firstly, technology transfer acquires an instrumental nature

[41] S. ALAM, *Technology Assistance and Transfers*, in in L. RAJAMANI, J. PEEL, cit., p. 957.
[42] *Ivi*.
[43] See United Nations, Agenda 21: programme of action for sustainable development, in Earth Summit, Agenda 21, the United Nations programme of action from Rio, A/CONF.151/26/Rev.1, *infra*.
[44] United Nations, Transforming our world: the 2030 Agenda for Sustainable Development, A/RES/70/1, 21 October 2015.
[45] *Ibidem*, pt. 17.7: «Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries on favourable terms, including on concessional and preferential terms, as mutually agreed».

finalized to the fulfilment of the purposes pursued by customary or conventional norms of environmental law. Thus, the proper exchange of technology enables the possession of scientific technological knowledge adequate to implement national production systems and ambitious environmental policies in line with international objectives. This is proved, *inter alia*, by the Vienna Convention for the Protection of the Ozone Layer of 1985, which refers to the solidaristic cooperation aspect of technology transfer in Art. 4(2), stating that «The Parties shall cooperate, consistent with their domestic laws, regulations and practices and taking into account in particular the needs of developing countries, to promote, directly or through competent international bodies, the development and transfer of technology and knowledge». The Convention was later enforced by the Montreal Protocol, adopted on 16 September 1987, whose Article 11 provides for the organization of meetings at regular intervals through special Conferences of the Parties (COPs) to encourage the sharing of scientific findings and to help disseminate the good practices represented by certain technological innovations that contribute to reducing ozone layer pollutants until their complete elimination.[46]

Secondly, technology transfer is one of the two main instruments of development assistance: financial and technology cooperation have often been two fundamental tools for fostering economic development, especially in emerging countries. In this sense, technology transfer operates as one of the two specific components to consider the sharing of particularly useful data and information that would otherwise not be available to geographically disadvantaged states, unable to invest resources in environmental technological innovation. The 1992 Convention on Biological Diversity (CBD) considers technology transfer as a tool «to make a substantial difference in the world's ability to address the loss of biological diversity[47]» and, at the same time, «to meet the needs of developing countries».[48] Therefore, even in the field of biodiversity protection, it is possible to detect how the instrument of technology

[46] Montreal Protocol, open to signature on 16 September 1987, entered into force on 1 January 1989, article 11, par.1: «The Parties shall hold meetings at regular intervals. The secretariat shall convene the first meeting of the Parties not later than one year after the date of the entry into force of this Protocol and in conjunction with a meeting of the Conference of the Parties to the Convention, if a meeting of the latter is scheduled within that period».
[47] Convention on biological diversity, open to signature on 5 June 1992, entered into force on 29 December 1993, Preamble, clause No. 16.
[48] *Ibidem*, Preamble, clause No. 17.

transfer can contribute to the dual objective of environmental protection in the broadest sense and technical cooperation at the international level to promote the effectiveness of the Convention with regard to the environmental protection objectives of developing countries.

Thirdly, as a direct consequence of the second point, technology transfer is an instrument of international cooperation, frequently reiterated in multilateral agreements. Many treaties refer to technology transfer, especially in environmental matters, because of the recognized relevance of the inclusion of certain scientific and technological findings that could have a significant impact in strengthening protection systems with reference to a given cluster of international environmental law. On this point, mention may be made of the Basel Convention, where in the Preamble it states «the need to promote the transfer of technology for the sound management of hazardous wastes and other wastes produced locally»,[49] considering technology transfer as a cooperative instrument aimed at promoting the environmentally sound management of hazardous wastes and other pollutants, in the form of waste, that may pose an environmental threat. A similar rationale also underlies the Rotterdam Convention, adopted in 1998 and entered into force in 2004, governing exports and imports of certain hazardous chemicals and pesticides, which recognizes, under Article 14(1)(a), the objective of exchanging «scientific, technical, economic and legal information concerning the chemicals within the scope of this Convention, including toxicological, ecotoxicological and safety information».[50] In this case, the transfer of technology represents an instrument of cooperation for the collection of data and information of a technical and scientific nature (but also economic and legal, as can be seen from the wording of the Article) to strengthen international cooperation in order to enclose, in a register shared by all contracting parties, the list of toxicological substances and similar chemical components that could represent a danger to human safety and the natural ecosystem.

The legal basis for technology transfer in the International Tropical Timber Agreement is found in Article 1(p), which states the objectives of the Agreement in «promoting access to, and transfer of, technologies and technical cooperation to implement the objectives of this Agreement, including on

[49] Basel Convention, which was adopted on 22 March 1989, entered into force on 5 May 1992, Preamble, clause No. 22.
[50] Rotterdam Convention, signed on 10 September 1998, entered into force on 24 February 2004, Art. 14(1)(a).

concessional and preferential terms and conditions, as mutually agreed».[51] The aim is to encourage technology transfer as a means of cooperation to achieve the objectives set out in the Agreement, on the basis of conditions and terms that are recognized as preferential towards its States Parties. The modalities of technology transfer referred to in Article 1 must be read with the combined reading of Articles 22, 25 and 27(4) of the Agreement, which provide for the referral to Council's coordinating role within the Organization[52] to enhance the exchange of information, data and economically viable production techniques and in the exchange of national environmental projects with a view to disseminating good environmental practice among the Member States. In this regard, technical and technological cooperation includes a wide range of tools that can be made available to Parties to facilitate scientific knowledge in strengthening the instruments of environmental protection of the world's tropical timber heritage. This knowledge does not necessarily have to be linked to a patent nature, which would otherwise prevent an effective technology transfer due to the commercial interests related to the sharing of production techniques by both public and private entities.[53] In fact, what is relevant in environmental technology transfer is the ability to transfer technologies through know-how, i.e. through non-patentable knowledge that can be universally shared with all subjects who wish to know the impact of a technical application on the technology in question.[54]

As governed by the combined provisions of Articles 25 and 28, concerning respectively the approval and monitoring procedures of environmental projects and the annual report and biennial review, it emerges how the Council accounts for the main decision-making body of the ITTO, with the aim to balance the best practices of tropical timber production with the environmental technologies that define a sustainable exploitation of these

[51] UNCTAD, *International Tropical Timber Agreement,* TD/TIMBER.3/12, 2006, cit., Article 1 (p).
[52] See Articles 22, 25 and 27(4) of the ITTA.
[53] SEE J.M. MOUSSERON, cit., p.6.
[54] Idem. See also United Nations General Assembly, *Legal Aspects of Technology Transfer: Current Activities of International Organizations within the United Nations system*, United Nations Commission on International Trade Law, Eighteenth session Vienna, 3-21 June 1985, A/CN.9/269, p.11. See also the role of the World Intellectual Property Organization (WIPO), to properly balance the commercial interest of the intellectual property rights with the technology transfer. On this theme see WIPO, *Favoriser le transfert de technologie et de connaissances*, available at https://www.wipo.int/patents/fr/technology/.

resources. It is therefore particularly clear that the ITTO, and more specifically its Council, is involved in balancing the participation of these States in the sustainable trade of tropical timber. Moreover, Article 28(5), when considering the Council's mandate to «endeavour to enhance the technical capacity of member countries, in particular developing member countries, to obtain the data necessary for adequate information-sharing, including the provision of resources for training and facilities to members», it allows the Council to work to improve member countries' production techniques, including training of tropical timber extraction personnel and the provision of environmentally sound technologies.[55] These monitoring functions in support of Member States' environmental projects are carried out through the role of a Panel of experts that provides technical expertise on the various action plans proposed by the States.

The strengthening of advisory activities towards projects proposed by States on the sustainable exploitation of their tropical timber resources seems to constitute a recently implemented objective within the Organization's agenda. During the 56th session of the International Tropical Timber Council, held in virtual mode from 9 to 13 November 2020, the Council reaffirmed as a programmatic objective of the ITTO the goal «to maintain and/or enhance biodiversity and ecosystem services of tropical forests and forest landscapes, while maintaining the sustainable production of timber and other products and services».[56] Within this goal, three objectives related to technology transfer are particularly relevant: firstly, the encouragement of «the full valuation of forest landscapes, including ecosystem services and biodiversity, as well as the collection and/or use of existing ecological and biological data that contributes to sustainable management of tropical forests».[57] Secondly, the promotion of

[55] UNEP defines environmentally sound technologies (ESTs) as «technologies that protect the environment, are less polluting, use all resources in a more sustainable manner, recycle more of their wastes and products and handle residual wastes in an environmentally-friendly manner. Such technologies can also be referred to as clean technologies» (available at https://www.unep.org/explore-topics/green-economy/what-we-do/environment-and-trade-hub/our-work/trade-environmentally). Some examples include renewable energy technologies such as solar panels and wind turbines, as well as air pollution mitigation equipment, whose increasing in their uptakes can result in several benefits for the environment.

[56] International Tropical Timber Council, *Report of the International Tropical Timber Council at its fifty-sixth Session*, ITTC(LVI)/18, 14 June 2021, Annex A, Programmatic Lines Goals and Objectives, Programmatic Line #2: *Conservation of Biodiversity and Ecosystem Services*, available at https://www.itto.int/direct/topics/topics_pdf_download/topics_id=6722&no=1&disp=inline.

[57] *Ibidem*, Objective No. 1.

«innovative approaches, technologies and practices (including payment for ecosystem services) and strengthen technical skills aimed at maintaining and/or enhancing tropical biodiversity and ecosystem services in production forests».[58] Finally, the assistance «in building countries' capacity to implement the ITTO/IUCN Guidelines for the Conservation and Sustainable Use of Biodiversity in Tropical Production Forests and other relevant ITTO and internationally acknowledged guidelines».[59]

There is also a fourth, particularly interesting objective, which is the Council's intention to strengthen cooperation with other international organizations, in particular with the secretariats of the CITIES (a multilateral Treaty to protect endangered plants and animals) and the Convention on Biological Diversity. The aim is indeed to strengthen the systemic vision in measures to implement forest biodiversity protection objectives, with the inclusion of certain tropical tree species worthy of protection in the CITIES listing. For these reasons, the Council focused not only on strengthening the evaluation procedures on project activities, but also on a holistic approach that takes into account the functionality of new scientific and technological practices aimed primarily at strengthening international systems for the protection of tropical biodiversity.

Some examples concerning the practice of technology transfer must be considered to understand the functioning of this legal arrangement within the ITTO. One of the most recent documents of this Panel was published on 22 October 2021.[60] As patterns of the technical advisory work carried out by this body, it is worth mentioning, *inter alia*, the Panel's assessment on the sustainable management of forest plantations in Thailand,[61] or the project by the same State aimed at strengthening a sustainable coastal forest in Southeast Asia through good biodiversity restoration practices,[62] the management of sacred forests in sites in Benin protected by the 1971 Ramsar Convention on Wetlands,[63] or the

[58] *Ibidem*, Objective No. 2.
[59] *Ibidem*, Objective No. 3.
[60] International Tropical Timber Council, *Report of the Expert Panel for Technical Appraisal of ITTO Projects Proposals*, ITTC(LVII)/5, 22 October 2021, available at https://www.itto.int/direct/topics/topics_pdf_download/topics_id=1940&no=0&file_ext=.pdf?v=.
[61] *Ibidem*, pp.17-18.
[62] *Ibidem*, pp.19-20.
[63] *Ibidem*, pp.21-23.

advice on the commercial and environmental use of Andean oak, pine and eucalyptus in a sustainable manner in Colombia.[64]

Regarding the strengthening of technology transfer and the perspective of implementation between tropical timber protection and biodiversity, it should be mentioned also the recent *Policy brief* released on March 3, 2022, concerning the main areas of cooperation between ITTO and CBD.[65] The strategy of cooperation between the two entities was launched in 2011 under the name of "ITTO - CBD Collaborative Initiative for tropical forest biodiversity" and was aimed at considering four main elements: 1) To enhance the local capacity for biodiversity conservation in production forests and for the rehabilitation of degraded and secondary forests; 2) To improve the conservation and management of protected areas, especially in association with buffering protected areas, and transboundary conservation; 3) To safeguard tropical forest biodiversity in forestry interventions; 4) To improve the welfare of local communities and indigenous groups through biodiversity conservation and the sustainable use of natural resources.[66] The cooperation notices the development of 16 projects in 23 tropical countries, all seriously affected by deforestation processes and loss of biodiversity. On the subject of transfer of technologies and information useful for the sustainable management of these natural assets, the Policy brief mentions, *inter alia*, the improved management in production of mangrove forests in Fiji with the restorement of 130 hectares of this species, the two improved education on biodiversity conservation and sustainable forest management designed for forest managers in countries in sub-Saharan Africa and the upper Amazon Basin or, additionally, the net increase in the size of a mangrove protected area in Peru by more than 700 000 hectares; providing more than 400 foresters and technicians in Central Africa with forestry education; enabling previously difficult transboundary cooperation on the management of the Emerald Triangle between Cambodia and Thailand.[67] Moreover, the Document suggests as a tool for policy guidance the objective of strengthening monitoring mechanisms, evaluation and

[64] *Ibidem*, pp.26-27.
[65] ITTO, CBD, *Achievements, challenges and ways forward for the ITTO–CBD Collaborative Initiative for Tropical Forest Biodiversity*, Policy Brief, 3 March 2022, available at https://www.itto.int/news/2022/03/03/joint_work_between_itto_and_convention_on_biological_diversity_lauded/.
[66] *Ivi*, p. 2.
[67] *Ivi*, p. 3.

learning systems to facilitate the sharing of data and information on biodiversity indicators for optimal management of tropical forest heritage.[68]

Within the ITTO's mandate, the elaboration of scientific knowledge and data concerning the sustainable management of tropical timber allows the members of this Organization to benefit from an environmental governance system capable of acquiring information, data and technical-scientific surveys of particular relevance in order to effectively combine environmental and economic policies in the concerned area of action. Specifically, the main role of the ITTO is as a "match-maker" to the transfer of sustainable extraction techniques to properly balance timber trade with the protection of State Parties' forest heritage. Consequently, technology transfer takes place mainly through the exchange of data and information owned by the Panel of Experts, for two reasons. Firstly, an assessment of the management of proposed projects by States allows the Organization to consider the range of environmental instruments that its Member States intend to deploy, in order to develop harmonized policies for the sustainable management of tropical timber. Secondly, in addition to the wealth of information available to the Organization, a benefit to the State in submitting these projects is noticeable, since the technical bodies' extensive knowledge of regional differences in tropical timber management. The submission of projects to the evaluation of the Panel of Experts therefore allows for the acquisition of a wide range of expertise from this body, which provides data, information and good practices in sustainable forest management that can be particularly useful technical and scientific information to the State that decides to submit a project to the ITTO.

Clearly, technology transfer is deemed to be a particularly relevant tool for sustainable forest management within ITTO. However, some critical issues need to be addressed when considering the issue of deforestation in the specific field of tropical timber market.

5. *Lights and shadows of ITTO system in connection with the technology transfer*

Technology transfer constitutes a widely deployed tool by the ITTO to promote good practices in the sustainable exploitation of tropical timber and its

[68] *Ivi*, p. 7.

marketing at global level. However, few considerations need to be made regarding the effectiveness of this system in international environmental cooperation through the ITTO. While it is agreed that the ITTO's system constitutes a virtuous regime that favors the dissemination of environmentally sound technologies, it is also true that this legal regime is applied *stricto sensu* with reference to tropical timber and to the Member States of this Organization. Therefore, this system of cooperation operates *ipso facto* with reference to a specific regime of international environmental law, precisely aimed at protecting the sustainable management of tropical timber and the resulting trade effects from an international perspective. The broader issue of deforestation in geographical areas outside the territorial scope of the Agreement therefore remains confined to the dimension of soft law, unable to determine legally binding duties on behalf of States on the sustainable management of forests at the international level. [69]

With reference to the project activities of this Organization, it should be noted that the involvement of States depends mainly on their willingness to actively participate in the exchange of data and information for the sustainable exploitation of their forest heritage. Therefore, the ITTO is devoid of any coercive power that would allow them to appropriately sanction those States that do not follow the planning indications of the ITTO's Technical Panels or which, even worse, start-up projects for the exploitation of their own forests without prior communication to the competent ITTO's bodies. In these circumstances, a Member State is free to submit or not its project activities to the ITTO's technical bodies, and to furtherly decide, in the worst-case scenario, to start policies of tropical wood exploitation on the grounds of its own economic needs. Such behavior does not, in fact, violate any rule of international law, referring to the general principle of State sovereignty over its natural resources, which legitimizes national claims of discretion in the use - and therefore the level of protection - of the forest heritage.[70]

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[69] See, *inter alia*, A. PŪRAITĖ, *Impact of International Legal Instruments on Forest Protection*, in *Public Security and Public Order*, Vol. 9, 2013, pp. 239-241; S. BRAATZ, *International Forest Governance: International Forest Policy, Legal and Institutional Framework*, XII World Forestry Congress, 2003, Québec City, Canada, available at https://www.fao.org/3/xii/1053-c5.htm.

[70] See, for instance, the economic policy of Brazil in recent years, which has carried out extensive deforestation of the Amazon rainforest to convert these territories to economic use. This has had an impact not only on biodiversity, but also on the indigenous communities that used to reside permanently on this territory. On this point, see A. BENYISHAY, S. HEUSER, D. RUNFOLA, R. TRICHLER, *Indigenous land rights and deforestation: Evidence from the Brazilian Amazon*, in *Journal of*

However, it is worth considering some particularly effective instruments of technology transfer under the ITTO, as a proof of this international legal regime to rebalance the protection of tropical forests towards the perspective of equitable use. The attempt to standardize this system therefore operates, through the ITTO, by means of project activities which, from the initiative of the Member States, are submitted to the scrutiny of the ITTO's technical experts and then returned through technical-scientific indications which allow the implementation of national protection strategies for tropical forests. The merit of technology transfer in this area is therefore the attempt to define common standards for the sustainable use of tropical timber, taking into account both commercial interests and forest protection requirements raised by tropical timber management. Finally, the transfer of technologies in this sector seems to clearly show the main features that are generally ascribable to the category of so-called environmentally-sound technologies. If these technologies are freely shared by States, and therefore not subject to any patent protection regime, it follows that States have a general interest in sharing them in order to gradually acquire information and data that can contribute to the improvement of international environmental policies. The consultative nature of the expert bodies of the ITTO and the assessment procedures regarding the project activities proposed by the States are expressed precisely through a free and publicly shared transfer of technologies to all the other Member States, facilitating the cooperation and data exchange procedures that may be useful for strengthening virtuous practices in the management of tropical timber on the one hand, and in its correct and fair marketing with the States concerned, on the other.

Hence, it is in this perspective that technology transfer finds its most evident application, representing a legal instrument to overcome these problems and to define new logics of equitable use in the fight against deforestation of tropical timber forests at the global level. If technology transfer defines a non-commercial nature related to the transferred technology,[71] it can be argued that it enables a cooperation system aimed at the acquisition of economic welfare of all

Environmental Economics and Management, Vol.86, 2017, pp.29-47; J. P. OMETTO, A. P. DUTRA AGUIAR, L. A. MARTINELLI, *Amazon deforestation in Brazil: effects, drivers and challenges*, in *Carbon Management*, Vol. 2, Issue 5, 2011, pp.575-585; F. SEYMOUR, N.L. HARRIS, *Reducing tropical deforestation*, in *Science*, Vol. 365, No. 6455, 2019, pp.756-757.

[71] J.M. MOUSSERON, *Aspects juridiques du know-how*, in *Cahiers de droit de l'entreprise*, 1972, Vol. 1, p. 6.

the Parties involved. In the context of the ITTO, it has been shown how this system can work effectively through a collective level of involvement.

6. *Conclusions*

International law of forest represents a very narrow and fragile area within international environmental law. Its legal sources are mostly non-binding, thus leaving wide discretion in the use and exploitation of State's forest heritage. However, it has been noted that a specific sector, represented by tropical forest, is the only area where a legally binding agreement has been adopted, which has consequently established the International Tropical Timber Organization. The ITTO is the only international organization whose inherent action is to combine the economic development demands of tropical timber owning countries with the objective of sustainable management of this natural heritage. In particular, the need for developing countries to commercialize these resources would assert the dimension of sovereignty that presses for free management of the national forest heritage, in the absence of international legal constraints.

However, balancing the perspective of sustainable management of this forest heritage seems to be done on behalf of the Organization through technology transfer. This is manifested in its most obvious way through the exchange of information data and technical-scientific evaluations that can be particularly useful for the improvement of extraction techniques and the knowledge of new tools for the sustainable management of tropical forests that can be implemented as part of the economic development plans of the States involved. What makes technology transfer as further valuable in this area of international environmental law is indeed its ability to create systemic integration also with reference to other clusters of this legal system, as seen in the case of biodiversity protection or the protection of endangered species. The all-encompassing approach with reference to the biotic communities of a territory thus makes it possible to establish a system of international protection that shields this natural resource through the exchange of virtuous practice and scientific information that directly affects the effective preservation of tropical forests.

To sum up, faced with the complicated role of seeking a legal perspective of protection in the management of tropical timber resources internationally, it is possible to consider how technology transfer represents, in its instrumental logic, a particularly useful tool to direct the work of the ITTO States Parties to rethink

extraction techniques and to strengthen international cooperation in a dual perspective. Firstly, the need to commercialize tropical wood emphasize the importance of this Organization in the definition of standards of protection of this natural resource, as goods of growing demand within international markets. Secondly, the ecosystem fragility associated with tropical forests underscores the need for an internationally concerted approach that can recognize in the fight against tropical forests deforestation a fundamental element of environmental protection. It is for this reason that technology transfer represents a legal instrument of international cooperation capable of recognizing the needs of economic development associated to the exploitation of these natural resources with the instances of international protection of tropical forests.

ABSTRACT

Francesco Gaudiosi – *Technology transfer in sustainable trade of tropical timber: the contribution of the International Tropical Timber Organization between State sovereignty and international protection of forests*

The following work aims at analyzing the technology transfer mechanisms in the field of protection and sustainable trade in tropical timber. With reference forests the work intends to scrutinize the engagement of States to favor an effective technology transfer in the field of sustainable trade in tropical timber market. Therefore, the paper intends to consider the legal tension between the principle of permanent sovereignty over natural resources and the principle of equitable use of these ones. While the concept of sovereignty still stands the defining element with respect to the full and exclusive use of the forest heritage, some developments in international environmental law are evident, thus underlining the growing emergence of equitable use as a constitutive value in the international law of forests. With regard to the issue of tropical forests, the work intends to detect the contribution of the International Tropical Timber Organization (ITTO), as an international legal entity which, on the basis of its founding treaty, defines a binding legal regime for the protection of forests and, consequently, for the sustainable trade of tropical timber on a global scale. In this sense, the instrument of technology transfer through the technical advice provided by this Organization represents a constituent of scientific and technical cooperation to balance economic interests with the legal prerogatives of environmental protection. The transfer of environmentally-sound technologies represents a modality of technology transfer aimed at fostering international cooperation for the protection of tropical forests, indeed recognizing the social and economic benefits that this mechanism can have towards developed and developing countries.

KEYWORDS: *International Environmental Law; International sustainable trade; Tropical Timber Market; International Tropical Timber Organization; Protection of forests; Environmentally-sound technologies; Technology Transfer.*