Journal of Intellectual Property Rights
Vol 31, July 2026 pp 599-612
DOI: 10.56042/jipr.v31i4.26395

TRIPS Agreement and its Impact on Patenting Eco-system and Patenting in India: A Comprehensive Review

Laxman Prasad[1†] and S K Kulshrestha[2]

[1]Raj Kumar Goel Insitute of Technology, Ghaziabad – 201 001, India

[2]Department of Scientific and Industrial Research {DSIR), Ministry of Science and Technology, GoI, New Delhi -110 016, India

Received: 10th December 2025; accepted: 9th April 2026

TRIPS Agreement was made with the objective that it would spur in patenting activities and dissemination of technical knowledge in society. The aim of this study is to map the efforts made by India for compliance with TRIPS Agreement and its impact on patenting eco-system and patenting activities in the country. The present study reveals positive impact on patent eco-system as evidenced by the steps taken by India for strengthening of S&T infrastructure, adoption of appropriate S&T policies, and enhancement in investment on R&D during and post-TRIPS compliant regime. Analysis of the patenting activities distinctly highlights an accelerated impact on patenting activities by Indian applicants in comparison to that of foreign applicants. As a result, patent applications filed by Indian applicants out-numbered filings by foreign applicants in the financial year 2022-23, reversing the long standing past trend of higher filing by foreign applicants. This trend of higher filings by the Indian applicants continued in the subsequent years 2023-24 and 2024-25 also.

Keywords: IPR, Patent, Patent Filing, Patent Grant, S&T Policy, R&D Expenditure, TRIPS

During the decade of eighties, sphere of international trade started showing its widening from trade in goods, to other areas like trade in services, investments and technology. The developed nations, primarily driven by corporate interest, started raising the issues of intellectual property (IP) regimes in the countries of their then existing and prospective trading partners.[1] They considered that weak or no IP regime in other countries led to distortion of international trade as looked in its enlarging sphere of trade. The developed countries also apprehended that some of the developing countries had adequate and qualified S&T manpower to imitate their goods or copy their ideas or technical know-how. They wanted 'trade related aspects of IPRs' to be included within the ambit of General Agreement on Tariffs & Trade (GATT) negotiations.

Developed nations succeeded in bringing the matter related to trade related aspects of intellectual property rights (TRIPS) under the ambit of GATT. The Eighth Round of GATT Negotiations started in September, 1986 in Uruguay to deliberate and negotiate these and other issues. It was concluded in the year 1994 in Marrakesh in Morocco after 123 member countries agreed to establish World Trade Organisation (WTO) and to include TRIPS Agreement under its ambit. Thus, WTO was established and became operative from 1st January, 1995.

Indian Scenario

Post-independence, India, with the object of making medicines available to her population at affordable prices and realising the economic growth through R&D, implemented a revised Patent Law (The Indian Patents Act, 1970). This Act came into force from 20th April, 1972 and remained in force till December, 1994. The out-come of the Patents Act, 1970 was remarkable in the sense that a major production of formulations (pharmaceutical products) which was dominated by the subsidiaries of multi-national companies got changed by 1991. The Indian firms accounted for 70% of bulk drugs and 80% of formulation production in India.[2] This kind of achievement in pharmaceutical sector by Indian firms raised concerns of developed countries about the Patents Act, 1970.

Around the time when Uruguay Round ofNegotiations were in progress (1986-91), India, was passing through very difficult circumstances.

†Corresponding author: Email: laxmanpd@rkgit.edu.in

Foreign exchange reserves receded to the extent that they were just enough to meet her three weeks' import bill at the end of December, 1990.[3] Also, attracting foreign collaboration and foreign direct investment (FDI) was very difficult which could be due to cumulative effect of the then prevailing economic policies, intellectual property regime and political instability in the country. Moreover, USA started applying other tactics like identifying India in the list of 'Priority Watch List' of countries under 'Special 301' provision of the Omnibus Trade and Competitiveness Act, 1988, and US Trade Act of 1974 by the US Trade Representative (USTR). Thus, there were factors, both, internal as well as external, building up asking India to liberalise her economic policies and change the IP regime.

Incidentally, India, being aware of her huge market size and having confidence in her scientific and technical capability and capacity to innovate, decided to liberalise her economic policy by shifting from the closed and controlled economy to open market economy. India launched its New Economic Policy 1991 (NEP 1991) on 24th July, 1991. The primary objects of NEP 1991/New Industrial Policy 1991 are modernisation, globalisation, liberalisation, and deregulation.[4] Around the same time, in light of NEP 1991 and subsequent developments, India revisited her stand in the Uruguay Round of Negotiations and finally chose to become party to the Agreement in April, 1994. Thus, India became founder member of WTO w.e.f. 1st January, 1995.

Scope, Objectives and Principles of TRIPS Agreement

TRIPS Agreement has 73 Articles defining its scope, objectives, principles and various transitional and institutional arrangements. It includes seven categories of intellectual properties *viz* copyright and related rights, trademarks including service marks, geographical indications, industrial designs, patents, layout-designs (topographies) of integrated circuits, and undisclosed information.[5] For compliance purposes, Articles 2, 7, 27 and 33 of the Agreement need attention in particular. Article 2 deals with the compliance of existing intellectual property conventions and Article 7 with objectives of TRIPS Agreement. Article 7 stipulates that IPR should promote technological innovations and dissemination of technical knowledge in society. Articles 27 and 33 will be covered in Section 4 with the relevant subject matter.

Timelines for TRIPS Compliance

The TRIPS Agreement under Article 65(4) provided different timelines for developed, developing and the least developed countries to make their respective national laws fully compliant with it. The developed countries were required to comply by 1st January, 1996, developing countries by 1st January, 2000 and the least developed countries by 1st January, 2005. India, besides being a developing country was also required to permit product patent protection for chemicals including drugs, was granted extension by another 5 years.

Actions Taken by India to Become TRIPS Compliant

Joining of Conventions

To fulfil the requirements of Article 2 of the Agreement as mentioned earlier in Para 3, India joined following Convention(s) / Treaties:

(i) Paris Convention, w.e.f. 7th December, 1998,

(ii) Patent Co-operation Treaty (PCT) (1970), w.e.f. 7th December, 1998,

(iii) Budapest Treaty on the International Recognition of the Deposit of Micro-organism for the Purpose of Patent Procedure (1977), w.e.f. 17th December, 2001 and

(iv) Madrid Protocol, w.e.f. 8th July, 2013.

Providing Required Minimum Level of IP Protection

For compliance of IP protection with TRIPS Agreement, in Indian context, following three kinds of situations arose:

(i) Areas such as geographical indications, layout designs of integrated circuits etc. where no IP laws existed,

(ii) Areas such as copyrights, trademarks and industrial designs where IP laws were there but required minor changes for being compliant with TRIPS Agreement, and

(iii) Area like patents where the law was there but it needed major changes for being compliant with TRIPS Agreement.

India adopted three pronged strategies for compliance of IP laws as mentioned below:

Introduction of New Laws

New laws were promulgated for providing IP protection in respect of Geographical Indications (GI), New Plant Variety, and Layout of Integrated Circuits.

Amendments in IP Laws Requiring Minor Changes

IP protections provided for Copyright, Trademarks and Industrial Designs were not very different from the minimum level of protection as prescribed under TRIPS Agreement. Accordingly, minor amendments in them, as required, were implemented through the following amendments in the respective Acts:

(i) The Copyright Act, 1957 (as amended up to 1999) w.e.f. 15th January, 2000.
(ii) The Designs Act, 2000 w.e.f. 11th May, 2001.
(iii) The Trade Marks Act, 1999 w.e.f. 15th September, 2003.

Further, it was believed that the subject matter of abuse of undisclosed information such as know-how, trade secrets etc. could be treated and dealt with appropriately under the then existing Indian criminal laws. Similarly, trade in counterfeit trademark goods and pirated copyright goods could be dealt with the then existing laws.

Amendment in the Patents Act, 1970 Requiring Major Changes

As mentioned in section 3.1 above, India was obligated to amend various provisions of the then existing Patents Act 1970 by 1st January, 2005.

Major Differences between TRIPS Agreement and the Patents Act, 1970

The pre-revised Patents Act, 1970 did not permit the grant of product patent for certain class of substances (chemicals including pharmaceuticals, agrochemicals and food). Also, the term of patent was at variance with TRIPS Agreement. Articles 27 and 33 of TRIPS Agreement and Sections 5 and 53 of the Patents Act 1970 are relevant in this context. They are partly reproduced below for the sake of brevity:

Article 27:Patentable Subject Matter

(1) Subject to the provisions of paragraphs 2 and 3 below, patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application. (Paragraphs 2 and 3 are not reproduced for brevity)

As against Article 27 of the Agreement, Indian Patents Act, 1970 (before revision in 2005), under Section 5 (1), excluded certain substances intended for use, or capable of being used, as food or as medicine or drug frompatents. Only methods or processes of manufacture were patentable in respect of such substances.[6]

Article 33:Term of Protection

"The term of protection available shall not end before the expiration of a period of twenty years counted from the filing date and is uniform both for products and processes".

On the other hand, the term of protection as provided in Section 53 of the Patents Act 1970 (pre-revised) in India for products and processes was different. For substances capable of being used as food or as a medicine or drug the term of protection was five years from date of sealing of the patent or seven years from the date of patent whichever was shorter and in respect of any other invention it was fourteen years from the date of patent.

Action taken to Ammend the Patents Act, 1970

India amended the Indian Patents Act, 1970, in a calibrated manner in three stages, as mentioned below, making full use of the flexibilities and transition periods made available to a developing country requiring to get engaged in the process of establishing product patent regime. The Patents (Amendment) Act, 1999 was brought into force retrospectively w.e.f. 1st January, 1995 permitting filing of application for product patents in the area of drugs, pharmaceuticals and agro-chemicals though such patents were not allowed.[7] The second amendment to the Patents Act, 1970 was made through the Patents (Amendment) Act, 2002 with the objective of development of technological capability in India.[8] This Act came into force on 20th May, 2003 with the introduction of new Patent Rules, 2003. Important changes made by this Act are:

(i) Term of every patent granted under the amended Act and every valid patent which was in force as on 20th May, 2003 became 20 years.
(ii) Substitution of Section 83

Section 83 of the pre-revised Patents Act, 1970 was substituted by way of addition of five sub-clauses c, d, e, f and g to it with effect from 20th May, 2003. Sub-clause 83(c) which deals specifically with transfer and dissemination of technology is reproduced below:

Section 83 (c)

That ---------- the patent rights contribute to the promotion of technological innovation and to the transfer and dissemination of technology, ---------- conducive to social and economic welfare, and to a balance of rights and obligations.

The third amendment to the Patents Act, 1970 was introduced through the Patents (Amendment) Act, 2005 on 4th April, 2005 which was brought into force

retrospectively from 1st January, 2005.[9] The major change made by Patents (Amendment) Act, 2005 is the extension of product patents to all fields of technology including food, drugs, and chemicals.

With the above mentioned promulgation of new laws and amendments in the existing laws, India fulfilled her obligations under TRIPS Agreement. Having done that, it was anticipated that TRIPS Agreement would have impacted many segments of patenting eco-system and filing of patent applications by Indian and foreign applicants.

Impact on Patenting Eco-System in India

The canvas of eco-system for patenting activities encompasses a number of players including S&T Policy, S&T Infrastructure, Resources for R&D, Patent Office and IP Policy. Each of them has important role towards meeting the basic object of patent law as observed by the Supreme Court of India, 'The object of the patent law is to encourage scientific research, new technology and industrial progress'.[10]

Impact of TRIPS Agreement on Science and Technology Policy

After independence, Indian leaders and scientists made effective use of science and technology in the economic growth of India and achieving self-reliance. During the process of joining WTO and post-TRIPS compliant patent regime India replaced Technology Policy Statement 1983 by S&T Policy 2003 giving due importance to generation and protection of intellectual property as is clear from one of the objectives of S&T Policy 2003 given below:

Science and Technology Policy 2003

'To establish an Intellectual Property Rights (IPR) regime that maximizes the incentives for generation and protection of intellectual property of all types of inventions.'

Subsequently, S&T Policy 2003 was replaced by Science, Technology and Innovation Policy 2013.

Science, Technology and Innovation Policy 2013

One of the objectives of this policy is 'Establishing world-class infrastructure for R&D for gaining global leadership in some select frontier areas of science'.

Following the directives of S&T policies a number of institutes such as Indian Institute of Science Education and Research, National Institute of Pharmaceutical Education and Research, Academy of Scientific and Innovative Researchhave been established towards ensuring availability of qualified manpower for scientific research particularly in the areas of chemistry, pharmaceuticals, and biotechnology.

Strengthening Infrastructure andLaunching of New Schemes

The Government took appropriate steps by setting up new centres/mechanisms and by way of various incentives to promote innovation and facilitate patenting activities in the country to meet the challenge thrown open by TRIPS compliant Patents Act as briefly mentioned below:

Setting up of New Centres

(i) Technology Information, Forecasting and Assessment Council (TIFAC), DST, Government of India set up Patent Facilitating Centre in 1995 to facilitate researchers by providing financial support for seeking services of patent attorneys.[11]

(ii) Department of Biotechnology, Government of India set up Biotechnology Patent Facilitation Cell in 1999 to support patent related activities in the field of biotechnology.[12]

(iii) MSME Development Organization, Ministry of Micro, Small and Medium Enterprises, Government of India set up Intellectual Property Facilitation Centre in the year 2000 for supporting IPR related activities in MSME sector.[13]

Initiating New Scheme for Research in Drugs &Pharmaceuticals

The Government of India initiated a programme on drug & pharmaceutical research in DST during 1994-95to stimulate research and strengthen infrastructure for product development in pharmaceutical sector.[14]

Creating Data-Base of Prior Art for Ascertaining novelty of Invention

Traditional Knowledge Digital Library (TKDL) was established by Council of Scientific & Industrial Research (CSIR). It helps patent offices, world-wide, in determining existence of prior art so that the infamous case of patent granted for medicinal (wound healing) property of turmeric (US Patent No; 5401504) is not repeated due to lack of availability of existing prior knowledge. A review on turmeric patent case with its implications on documentation of traditional knowledge has been made by Bhowmick *et al.*[15]

Creating Facility for IP and Techno-Commercial Information Service

CSIR established 'Unit for Research and Development of Information Products' (URDIP),

Pune. This centre is engaged in pre-research and pre-development phase of the research projects by providing IP and Techno-commercial information service.[16]

National Intellectual Property (IP) Rights Policy

The National IP Rights Policy was launched by Government of India on 12th May, 2016 to promote creativity, stimulate innovation and to get value for IPRs through commercialisation.[17]

Patent Generating and Support System

The higher educational institutions including universities, Indian Institutes of Technology (IITs), National Institutes of Technology (NITs), National R&D labs and in-house R&D labs in public and private enterprises play an important role in generating novel devices and products worthy of patents. It hardly needs any mention that these organizations require adequate financial resources for effective functioning. The status of patent generating systems and R&D resources, pre and post-TRIPS Agreement, is given below:

Patent Generating System

Pre-TRIPS

Total number of R&D institution during the year 1994-95 when the Agreement was signed was 2749. Sector-wise distribution of these institutions, as published by DST is given below in Fig.1.

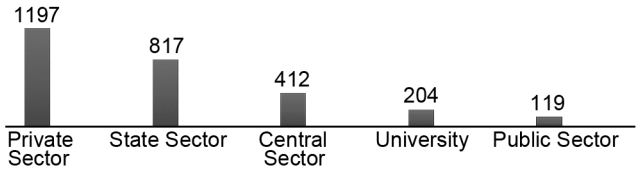

Fig. 1 — Sector-wise Distribution of R&D Institutions (FY 1994-95)

Source: Directory of R&D institutions, 1994, DST, Govt. of India

Post-TRIPS

The directory of R&D institutions, published in 1999 by DST is a compilation of 2899 institutions. The sector-wise distribution is given below in Fig. 2.

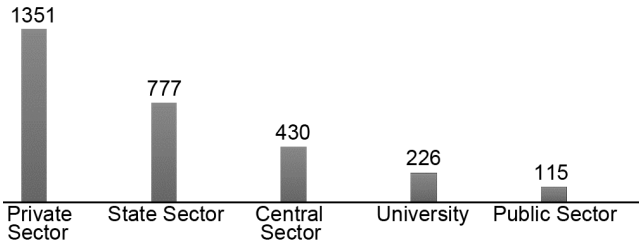

Fig. 2 — Sector-wise distribution of R&D institutions (FY 1999-2000)

Source: Directory of R&D institutions, 1999, DST, Govt. of India

It can be seen from Figs 1 & 2 that there is an addition of 18 R&D institutions in the central sector and significant addition of 154 institutions in the private sector within a span of five years.

Patent Support System

The support system is primarily promoted and provided by the government which played a catalytic role in enhancing investment for R&D, creating specialised centres within the existing systems for supporting patent related activities orinitiated new schemes to promote research and development inpharmaceutical sector to meet the challenges thrown open by TRIPS compliance.

Resources for R&D

The national expenditure on R&D for the period FY 1995-96 to 2020-21 is depicted below in Figs 3 & 4, in absolute terms as well as in percentages of gross domestic product (GDP), respectively.[18]

1 Cr = 10 Million

Source: R&D Statistics 2022-23, DST, Govt. of India

Source: R&D Statistics 2022-23, DST, Govt. of India

R&D Expenditure during Pre-TRIPS

As is evident from Figs 3 & 4, India invested Rs.7483.88 Cr on R&D in FY 1995-96 which forms around 0.61% of GDP. This expenditure rose, both in absolute terms as well as percentage of GDP in FY 2005-06, to Rs. 29932.58 Cr and 0.81% respectively.

R&D Expenditure during Post-TRIPS

During the next five years of the TRIPS Agreement, as can be seen from Figs. 3 & 4, India invested highest percentage of GDP on R&D (0.84%) in FY 2008-09. It amounted to Rs. 47353.38 Cr. The Economic Survey of India 2023-24, presented to the Parliament on 22nd July, 2024, reveals the gross

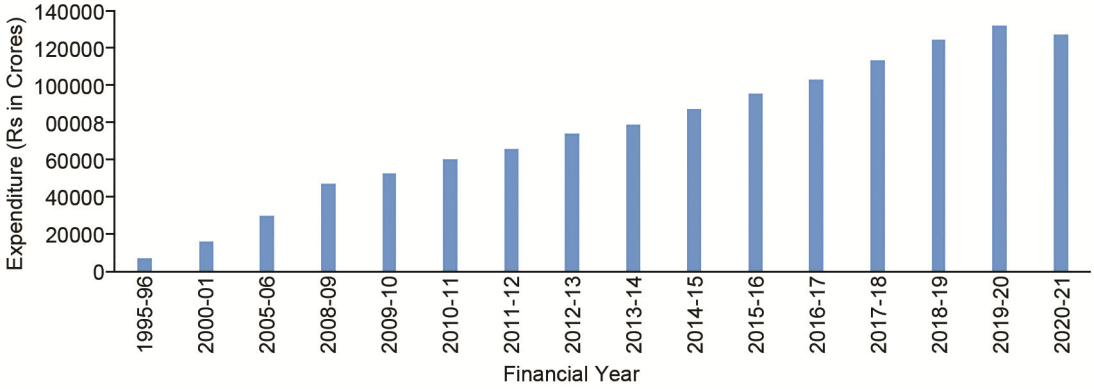

Fig. 3 — National expenditure on R&D

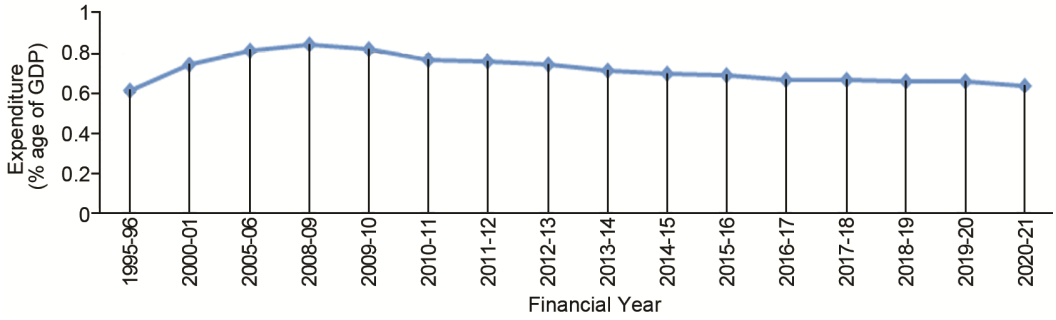

Fig. 4 — National expenditure on R&D as percentage of GDP

expenditure on R&D has consistently increased, more than doubled, from Rs 601.96 billion in FY 2011-12 to Rs 1.27 trillion in FY 2021-22.[19]

Impact on Modernization of Patent Office and Administration of Patent Law

With the object of executing above mentioned policy directions India upgraded and modernized the Patent Office in all aspects of its operations by recruiting a large number of technical officers, making use of modern technologies at different stages from patent application to the grant of patent and encouraging submission of applications for patent and other documents electronically. For faster communication and dissemination of patent related information, 'Official Journal' of the Patent Office was launched in the year 2005.[20]Apart from Patent Office, patent agents are also an integral part of patenting eco-system. These agents help the applicants at different stages of process of grant of patent and play important advisory role. As on 31st March, 2005 there were 743 qualified patent agents registered with the Patent Office. There is significant growth in this number touching the figure of 6042 as on 31st March, 2025.

The Patent Rules, 2003 were amended in the years 2006, 2016, 2017, 2019, 2020 and 2021to remove the procedural inconsistencies thereby resulting in accelerating grant of patents. Incentives including fee concessions to encourage filing of patent applications and provisions for expedited examination have been given to start-ups, small entities, female applicants and government companies to encourage filing of patent applications.[21,22] Recognising the importance of role of education institutions in the country's innovation and IP eco-system and to encourage their greater participation they have been included in the category for 80% fees concession through the Patent (Amendment) Rules, 2021, effective from 21st September, 2021.[23]

The Hypothesis

According to a study done by Arza et al on the impact of IPR harmonisation under TRIPS Agreement on patenting activities in Latin American countries the Latin American firms could not benefit from TRIPS compliant patent regime as much as the subsidiaries of MNCs due to lack of capabilities and resources required to use patents for protecting innovation as strategic assets.[24] Another study made by Xuan Li on the impact

of higher standards in patent protection for pharmaceutical industries under the TRIPS Agreement reports that 91.6 percent of the patent applications were filed by foreigners in the field of chemicals in China in 2004. Only a small number of patent applications were filed by Chinese nationals and that too mostly for protecting process patents.[25] It is further reported that expenditure of Chinese domestic firms on R&D as percentage of sales ranges from 0.5 percent to 3.0 percent (Centre for Management of IP in Health R&D, 2005). In contrast, pharmaceutical industries in India spent 3.6 percent of their turnover on R&D in 2003 to 2004 which is much higher as compared to the R&D expenditure incurred by the Chinese firms in pharmaceutical sector. Recently, it has been reported by Esra et al that whereas USA has benefitted from a robust IPR system, the evolving system of IPR (Industrial Property Code Number 6769) in Turkiye will enhance innovation in the country.[26]

In the Indian context, the entire patent eco-system including Indian Patent Office, S&T infrastructure, policies and administration of patent law has undergone a tremendous change during the process of India signing TRIPS Agreement and thereafter. With creation of such a robust patenting eco-system one would anticipate enhanced number of patent applications. Further, it is expected that relaxations in fee, incentives of various other kinds and setting up of facilitation system would result in higher filing of patent applications. It is, therefore, hypothesised in the Indian context that:

(i) filing of patent applications by Indian and foreign applicants would increase significantly in the post-TRIPS compliant patent regime, and

(ii) filing of patent applications specifically in the field of food, drugs and chemicals would also increase.

Both these hypotheses have been analysed and discussed in the following section dealing with impact on patenting activities.

Impact on Patenting Activities

Growth in Patent Filing

The Patents Act, 1970 became fully compliant with TRIPS Agreement during the financial year 01.04.2004 to 31.3.2005 (FY 2004-05) being followed in India. Figure 5, as drawn from Table 1, given below, shows the number of patent applications received by the Indian Patent Office, financial year-wise, starting from FY 2000-01 to 2024-25.[27]

Source: Data processed by authors

Table 2 shows the pattern of patent applications filed in the Patent Office not only financial year-wise but also in two blocks each of five years: FYs 2000-01 to 2004-05 (preceding the TRIPS compliant patent regime) and FYs 2005-06 to 2009-10 (post-TRIPS compliance). The number of applications includes the applications filed by Indian and foreign applicants.

As illustrated above in Table 2 there is a drastic increase in the number of applications from 60640 to 159762 filed during the post-TRIPS compliant regime block of five years (FYs 2005-06 to 2009-10) as compared to the block preceding the TRIPS compliance (FYs 2000-01 to 2004-05). The multiplier is 2.63.

The rise in filing of patent applications continues in the subsequent blocks of five financial years also i.e. FYs 2010-11 to 2014-15, 2015-16 to 2019-20 and 2019-24 as is evident from the following Table 3. Hike in the number of filings is abundantly clear and reflects a positive impact on patenting activities. Figure 6 shows the consolidated picture of all the five blocks. The multipliers are 3.5, 4.07 and

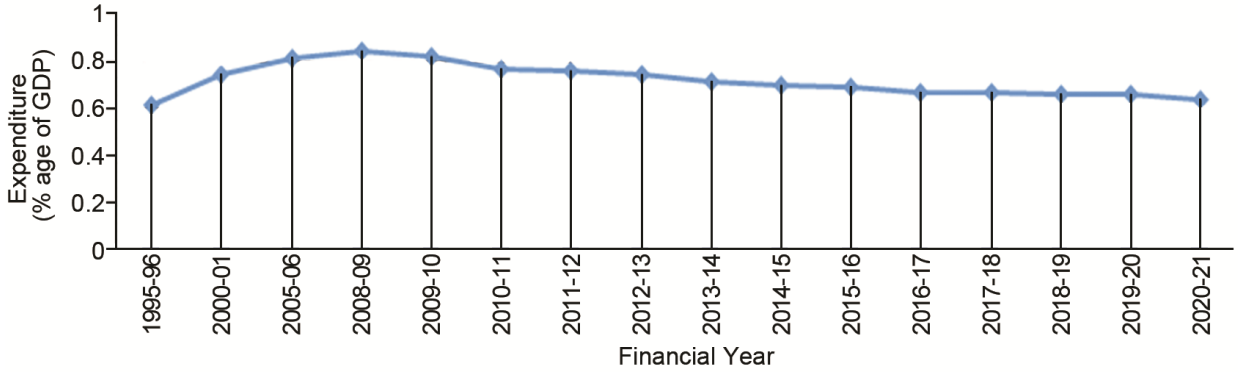

Fig. 5 — Number of patent applications filed in the Patent Office year-wise

Table 1 — Number of patents filed and granted year-wise

Financial Year	Patents Filed: Indian (% of Total Filing)	Patents Filed: Foreign (% of Total Filing)	Total Filing
2000-01	2179 (25.62)	6324 (74.37)	8503
2001-02	2371 (21.80)	8221 (77.62)	10592
2002-03	2693 (23.48)	8773 (76.51)	11466
2003-04	3218 (~25.0)	9395 (74.49)	12613
2004-05	3630 (~21.0)	13836 (79.22)	17466
2005-06	4521 (18.44)	19984 (81.55)	24505
2006-07	5314 (~18.0)	23626 (81.64)	28940
2007-08	6040 (~17.0)	29178 (82.85)	35218
2008-09	6161 (16.73)	30651 (83.26)	36812
2009-10	7044 (20.54)	27243 (79.46)	34287
2010-11	8312 (20.46)	31088 (78.90)	39400
2011-12	8921 (20.65)	34276 (79.35)	43197
2012-13	9911 (22.69)	33763 (77.31)	43674
2013-14	10941 (25.47)	32010 (74.53)	42951
2014-15	12071 (28.22)	30692 (71.77)	42763
2015-16	13066 (28.00)	33838 (72.14)	46904
2016-17	13219 (29.20)	32225(70.91)	45444
2017-18	15550 (32.50)	32304(67.51)	47854
2018-19	17005 (33.60)	33654(66.43)	50659
2019-20	20843 (37.05)	35424(62.96)	56267
2020=21	24326 (41.58)	34177(58.42)	58503
2021-22	29508 (44.41)	36932(55.59)	66440
2022-23	43301 (52.29)	39510(47.71)	82811
2023-24	51574 (55.95)	40594 (44.04)	92168
2024-25	68201 (61.79)	42174 (38.21)	110375

Source: Patent Office Annual Reports 2000-01 to 2024-25

6.76 respectively with respect to the base block (FYs 2000-01 to 2004-05

Source: Processed by authors

The number of applications filed during various blocks as shown in Tables 2 &3 and Fig. 6 includes the applications filed both by the Indian and foreign applicants. Mere hike in the number of total filings does not answer whether innovative activities have gone up within the country or not. To understand this aspect within the country, it is necessary to analyse the applications filed by Indian and foreign applicants separately.

Impact on Patent Filings by Indian and Foreign Applicants

Tables 4 to 8 given below show the number of patent applications filed by the Indian and foreign applicants separately and year wise with effect from the FYs 2000-01 to 2024-25. These Tables also show the growth in patent filings year-wise. Each Table covers a block of five financial years.

Tables 4 (a) and 4 (b) show that there is a sudden jump in patent applications filed by foreign applicants from 9395 in FY 2003-04 to 13836 in

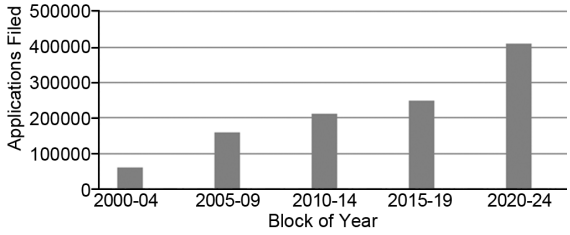

Fig. 6 — Patent applications filed during the blocks of five FYs

Table 2 — Patent applications by Indian and foreign applicants during FYs 2000-01 to 2009-10

Financial Year	Applications	Financial Year	Applications
2000-01	8503	2005-06	24505
2001-02	10592	2006-07	28940
2002-03	11466	2007-08	35218
2003-04	12613	2008-09	36812
2004-05	17466	2009-10	34287
Total	60640	Total	159762

Source: Patent Office Annual reports 2000-01 to 2009-10

Table 3 — Patent applications by Indian and foreign applicants during FY 2010-11 to 2024-25

Financial Year	Applications	Financial Year	Applications	Financial Year	Applications
2010-11	39400	2015-16	46904	2020-21	58503
2011-12	43197	2016-17	45444	2021-22	66440
2012-13	43674	2017-18	47854	2022-23	82811
2013-14	42951	2018-19	50659	2023-24	92168
2014-15	42763	2019-20	56 267	2024-25	110375
Total	211985	Total	247 128	Total	410297

Source: Patent Office Annual reports 2010-11 to 2024-25

FY 2004-05 with a growth of 47.27 % which is much higher than the growth rates of previous three years. On the other hand, the growth in the applications filed by the Indian applicants in FY 2004-05 is only 12.80 %. It may be noted that there is sudden jump of patent applications by the foreign applicants immediately after the TRIPS Agreement.

Tables 5(a) and Table 5 (b) as above cover the patent applications filed during a block of five financial years immediately following the FY 2004-05, the year of TRIPS compliant patent regime in India In this block, the number of applications filed by the foreign applicants is 130682 as compared to 46549 applications filed in the previous block of five FYs 2000-01 to 2004-05. The multiplier is 2.8. On

Table 4 (a) — Patent applications filed during FYs 2000-01 to 2004-05

	Financial Year (FY)					
Applicants	2000-01	2001-02	2002-03	2003-04	2004-05	TOTAL
Indian	2179	2371	2693	3218	3630	14091
Foreign	6324	8221	8773	9395	13836	46549
Total	8503	10592	11466	12613	17466	60640

Table 4 (b) — Percentage growth in patent application filings

	Financial Year (FY)					
Applicants	2000-01	2001-02	2002-03	2003-04	2004-05	Average Growth
Indian	NA+	8.81	13.58	19.49	12.80	13.67
Foreign	NA+	30.00	6.71	7.09	47.27	22.77

+ Not applicable

Source: Data processed by authors

Table 5 (a) — Patent applications filed during FYs 2005-06 to 2009-10

	Financial Year (FY)					
Applicants	2005-06	2006-07	2007-08	2008-09	2009-10	TOTAL
Indian	4521	5314	6040	6161	7044	29080
Foreign	19984	23626	29178	30651	27243	130682
Total	24505	28940	35218	36812	34287	159762

Table 5 (b) — Percentage growth in patent applications filings

	Financial Year (FY)					
Applicants	2005-06	2006-07	2007-08	2008-09	2009-10	Average Growth
Indian	24.55	17.54	13.66	2.00	14.33	14.42
Foreign	44.43	18.22	23.50	5.05	-11.12	16.02

Source: Data processed by authors

Table 6 (a) — Patent applications filed during FYs 2010-11 to 2014-15

	Financial Year (FY)					
Applicants	2010-11	2011-12	2012-13	2013-14	2014-15	Total
Indian	8312	8921	9911	10941	12071	50156
Foreign	31088	34276	33763	32010	30692	161829
Total	39400	43197	43674	42951	42763	211985

Table 6 (b) — Percentage growth in patent application filings

	Financial Year (FY)					
Applicants	2010-11	2011-12	2012-13	2013-14	2014-15	Average Growth
Indian	18.00	7.33	11.10	10.39	10.33	11.43
Foreign	14.11	10.25	-1.50	-5.19	-4.12	2.71

Source: Data processed by authors

Table 7 (a) — Patent Applications Filed During FYs 2015-16 to 2019-20

	Financial Year (FY)					
Applicants	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Indian	13066	13219	15550	17005	20843	79683
Foreign	33838	32225	32304	33654	35424	167445
Total	46904	45444	47854	50659	56267	247128

Table 7 (b) — Percentage Growth in Patent Application Filings

	Financial Year (FY)					
Applicants	2015-16	2016-17	2017-18	2018-19	2019-20	Average Growth
Indian	8.24	1.17	17.63	9.36	22.57	11.79
Foreign	10.25	-4.77	0.25	4.18	5.26	3.03

Source: Data processed by authors

Table 8 (a) — Patent Applications filed During FYs 2020-21 to 2024-25

	Financial Year (FY)					
Applicants	2020-21	2021-22	2022-23	2023-24	2024-25	TOTAL
Indian	24326	29508	43301	51574	68201	216910
Foreign	34177	36932	39510	40594	42174	193387
Total	58503	66440	82811	92168	110375	410297

Table 8 (b) — Percentage Growth in Patent Applications Filings

	Financial Year (FY)					
Applicants	2020-21	2021-22	2022-23	2023-24	2024-25	Average Growth
Indian	16.71	21.3	46.74	19.1	32.23	27.2
Foreign	-3.52	8.06	6.98	2.7	3.87	4.4

Source: Data processed by authors

the other hand, rise in the applications filed by Indian applicants is 2.06 times from 14091 to 29080. The annual average growth rate increased from 13.67% to 14.42% in the case of Indian applicants and in the case of foreign applicants there was a decrease from 22.77% to 16.02% (*Table 4* v *Table 5*).

In this block of five FYs from 2010-11 to 2014-15, the applications filed by the foreign applicants rose only 1.23 times from 130682 to 161829 {(Table 5 (a) v Table 6 (a)} as against 1.72 times rise in applications, from 29080 to 50156, filed by Indian applicants. The annual average growth rate was 11.43% in the case of Indian applicants as against 2.71% of foreign applicants.

Similarly, in the block of five FYs 2015-16 to 2019-20 also, as given in Table 7 (a) and Table 7 (b) above, the multiplier in case of foreign applicants remained low as compared to the multiplier for applications filed by Indian applicants. It was 1.04 for foreign applicants as against 1.59 for Indian applicants. The annual average growth rate in the case of Indian applicants was 11.79% as against 3.03% in the case of foreign applicants.

As is evident from Table 8 (a-b) above the annual average growth rate in the applications filed by Indian Applicants is 27.2% as against 4.4% in the case of foreign applicants. Overall annual average growth rate for the period FYs 2001- 02 to 2024-25 is 15.70% and 9.08% in the filings by Indian and foreign applicants respectively. In this process of rise in filing by the Indian applicants, the trend of higher filing by the foreign applicants became history in the FY 2022-23 when the trend reversed and thus filing by Indian applicants superseded the filing by foreign applicants as is evident from Table 8 (a). This trend continued in the FY 2023-24 and also in 2024-25. WIPO also in its report on World Intellectual Property Indicators (WIPI 2024 Report), published in November, 2024 records this trend of higher filing of patent applications in India by the Indian applicants.[28] This finding, in a manner, supports the results of the study made by Arza et al and by Xuan to the extent that resources and capabilities are equally important to benefit from the harmonised patent law as mentioned above in the hypothesis.

Ascending Trend in Patent Filing by Indian Applicants

From Fig. 7 given below it is clear that there is hike in number of applications filed by the Indian applicants from year to year and there is no fixed pattern in the filing by foreign applicants. It is also clear that the patent filing by Indian applicants remained less than the filing by foreign applicants until FY 2021-22. In this year, Indian applicants filed 29508 applications and the foreign applicants 36932. But in the FY 2022-23, this trend reversed. The filing by the Indian applicants was higher than the applications filed by the foreign applicants and it continued in the subsequent FYs 2023-24 and 2024-25 also.

Source: Data processed by authors

The catching up by Indian applicants was almost linear up to the FY 2016-17 and exponential thereafter. This kind of exponential growth beyond FY 2016-17 coincides with the year when concession in fee was given to certain categories of patent applicants. Secondly, the ratio of applications filed by Indians in the FY 2024-25 *vis-à-vis* the base FY 2004-05 in which the TRIPS Agreement was implemented

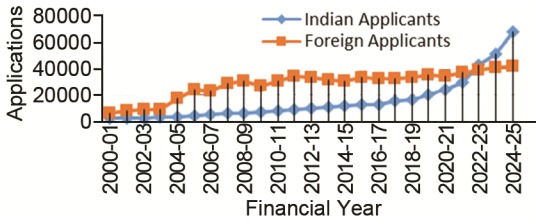

Fig. 7 — Applications filed by Indian and foreign applicants

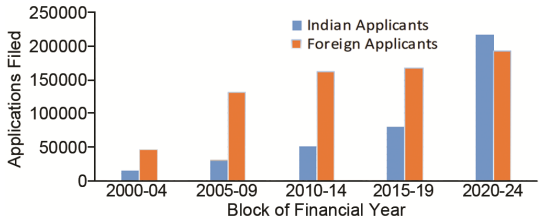

Fig. 8 — Block-wise patent applications filed by Indian and foreign applicants

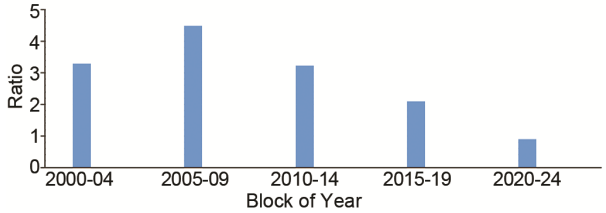

Fig. 9 — Block-wise ratio of applications filed by foreign and Indian applicants

in full by India is 18.78 which is much higher as compared to the corresponding ratio of 3.04 in the case of foreign applicants.

Figure 8 given below depicts the cumulative number of applications filed by Indian and foreign applicants in the block of five financial years.

Source: Data processed by authors

During the five years' block of FYs 2000-01 to 2004-05, Indian applicants filed 14091 applications as against 46549 applications filed by the foreign applicants. The ratio of applications filed by the foreign to Indian applicants is 3.30 in this block (FYs 2000-01 to 2004-05). This ratio as shown in Fig. 9 swells to 4.49 during the block immediately following the year FY 2004-05 indicating greater interest of foreign applicants in the Indian market. But the ratio gradually but consistently tapers down to 3.23 and 2.10 in the blocks of FYs 2010-11 to 2014-15 and 2015-16 to 2019-20 respectively and finally in the next five years' block of FYs 2020-21 to 2024-25 the ratio falls down to 0.89 reversing the past trend of higher filings of patent applications by the foreign applicants .

Source: Processed by authors

The above description clearly shows enhancement in patenting activities of the Indian applicant. It will be pertinent to recall that the Indian Patent Act, 1970 became fully compliant with TRIPS Agreement in 2005 and concession in fee to start-ups and academic institutions was provided in 2016 and 2021respectively. It would therefore be prudent to study the impact on filing of patent applications in chemical, drug and food as well as filings by start-ups and academic institutions in and around the respective years.

Impact on Patenting Activity in the Field of Food, Drugs and Chemicals

Grant of patents for products in the field of food, drugs and chemicals was allowed in Post-TRIPS regime from 1st January, 2005 onwards. As a result, it is expected that Indian as well as foreign innovators will rush in filing patent applications in the immediate following years. The data available in the Annual Reports of Patent Office after further processing by the authors is presented in Tables 9and 10 below. It indicates that the patent applications filed for grant of patent and patents granted in the fields of food, drugs and chemicals taken together have increased in the post-TRIPS regime. Just to illustrate, it may be mentioned that patents applications, taken together, in these fields have increased from 6422 in FY 2004-05 to 8122 in FY 2005-06. Similarly, patents granted have gone up from 832 in FY 2004-05 to 1737 in FY 2005-06. The filing of patent applications as well as grant of patents was at its peak in the year 2007-08 touching the figure of 10875 and 5628 respectively.This hike in patent filing in India supports the finding of Xuan Li (2008) that the pharmaceutical industry geared themselves in terms of resources to face the challenges arisen due to TRIPS compliant regime. A study made by Kiran, on patenting activities also endorses that patent filing in drugs and pharmaceutical sector is higher as compared to other sectors in post-TRIPS compliant regime.[29]

Impact on Patenting Activities in Start-Ups

The Government in the year 2016 launched a scheme 'Start-ups Intellectual Property Protection (SIPP)' to nurture innovative ideas of start-ups and encourage IPR protection and their commercialisation.[30] As per this scheme, the 'start-up' was made a new category of patent applicants with 80% concession in fees and a facility of expedited examination of their patent applications. It is needless

Table 9 — Number of patent applications filed during FYs 2004-05 to 2010-11

	Chemical (1)	Drug (2)	Food (3)	Sub Total (1+2+3) (4)	Percentage of Total (5)	Electrical (6)	Mechanical (7)	Biotechnology (8)	Computer /Electronics (9)	General (10)	Total (11)
2004-2005	3916	2316	190	6422	36.77	1079	3304	1214	2787	2659	17465
2005-2006	5810	2211	101	8122	33.14	1274	4734	1525	5700	3150	24505
2006-2007	6354	3239	1223	10816	37.37	2371	5536	2774	5822	1621	28940
2007-2008	6375	4267	233	10875	32.55	2210	6424	1950	4842	7110	33411
2008-2009	5884	3672	340	9896	26.88	2319	6360	1844	7063	9330	36812
2009-2010	6014	3070	276	9360	27.30	2376	6775	1303	7646	6827	34287
2010-2011	6911	3526	315	10752	27.29	2719	7782	1497	9594	7056	39400

Source: Patents Office Annual Reports 2004-05 to 2010-11 and processed by authors

Table 10 — Number of patents granted during FY 2004-05 to 2010-11

Year	Chemical (1)	Drug (2)	Food (3)	Sub Total (1+2+3) (4)	Percentage of Total (5)	Electrical (6)	Mechanical (7)	Biotechnology (8)	Computer /Electronics (9)	General (10)	Total (11)
2004-05	573	192	67	832	43.54	245	414	71	71	278	1911
2005-06	1140	457	140	1737	40.21	451	1448	51	136	497	4320
2006-07	1989	798	244	3031	40.20	787	2526	89	237	869	7539
2007-08	4071	1469	88	5628	36.88	1078	3230	314	2052	2959	15261
2008-09	2376	1207	97	3680	22.91	1140	3242	1157	1913	4929	16061
2009-10	1420	530	72	2022	32.78	404	1024	449	1195	1074	6168
2010-11	1899	596	84	2579	34.36	394	1458	165	892	2018	7506

Source: Patents Office Annual Reports 2004-05 to 2010-11 and processed by authors

to mention that India is the third largest start-up eco-system globally after USA and China. India has more than 0.1 million start-ups with more than one hundred unicorns.[31] Year-wise picture of patent applications filed by them from 2016 onwards is presented in Table 11. In the initial year, only 160 applications were filed by the Indian start-ups forming 1.21 % of the total patent applications filed in India by the Indians. This number rose to 2680 (3.92%) in the FY 2024-25. Creation of awareness regarding patents, fee concession and facilitation as provided under the SIPP scheme have played catalytic role in filing patent applications.

Table 11 — Patent applications filed by start-ups

Year	Start-ups			Total filing by Indian applicants
	Indian	Foreign	Indian % of Total	
2016-17	160	3	1.21	13219
2017-18	511	4	3.29	15550
2018-19	801	10	4.71	17005
2019-20	1650	2	7.92	20843
2020-21	1598	13	6.57	24326
2021-22	1482	19	5.02	29508
2022-23	2016	25	4.66	43301
2023-24	2546	25	4.93	51574
2024-25	2680	24	3.92	68201

Source: Patents Office Annual Reports 2016-17 to 2024-25

Impact on Patenting Activities in Academic Institutions

The Patents (Amendment) Rules, 2021 extended the benefits of eighty percent reduction in fee for patent filing and prosecution to educational institutions as well. This amendment has worked as a catalyst for applicants from educational institutions to encourage them to protect their inventions by filing more patent applications. Table 12 given below clearly illustrates this feature of enhanced filing by educational institutions. To support this statement, it may be noted that in the initial financial year of 2021-22, 7405 patents applications were filed by the Indian institutions. This number has risen to 19155 in 2022-23 with annual growth rate of 158.6%. This sudden surge in number of patent application could be an outcome of the fee concession which removed the constraint of financial resources faced by educational institutions, up-gradation of the then existing institutions and also due to awareness creation programs initiated by the Government. In the subsequent FYs 2023-24 and 2024-25, the growth in

Table 12 — Patent applications filed by educational institutions

Year	2021-22	2022-23	2023-24	2024-25
Indian	7405	19155	23306	37681
Foreign	96	275	237	213

Source: Patents Office Annual Reports 2024-25

patent applications filings was 21.6% and 61.6% respectively.

From this kind of growth rate it should not be interpreted that researchers working in educational institutions have suddenly become more innovative. But it certainly reflects that the incentives as extended under the Patent Amendment Rule, 2021 have encouraged them to file more applications which they could not afford prior to these rules.

Conclusion

On the move for harmonisation of the IPRs, there were differences in opinions across the globe. The developed countries favoured harmonization while the developing countries including India were not in its favour on the negotiating table. Finally, on conclusion of Uruguay Round of Negotiations, WTO was established on 1st January, 1995, and trade related aspects of IPRs, *inter alia*, were brought under its ambit. According to TRIPS Agreement, IPR regulations to be followed by the member countries have to meet the minimum standards as mentioned therein.

From the present study it is evident that discussions under Uruguay Round of Negotiations and compliance with TRIPS Agreement prompted the Government of India for reforming its S&T policies, establishing educational and R&D institutions, providing financial support to R&D, modernization of Patent Office coupled with changes in the Patents Act 1970, and streamlining of processes of patenting. These initiatives have enormously helped in fostering innovations and nurturing a culture of protecting innovations among the researchers in India. Further, the provisions restraining grant of product patent in the field of food, chemicals, drugs and pharmaceuticals have been amended and product patents are now patentable in all fields of inventions. Both, reforms and compliance with TRIPS Agreement, motivated the Indian and foreign applicants to file patent applications for innovative products in these sectors.

As a result of this holistic approach of reformation in patenting eco-system, the patenting activities have gone up by the Indian as well as foreign applicants. Significant rise in the filings by Indian applicants occurred once the concession in fee was granted to certain categories of applicants after FY 2016-17. On the whole, the annual average growth rate from FYs 2000-01 to 2024-25 was 15.70% for Indian applicants. On the other hand, patent filings by the foreign applicants also increased but the overall annual average growth was only 9.08%. In the case of foreign applicants, it is to be mentioned specifically that the growth in patent filing in the year of TRIPS compliance i.e. FY 2004-05 was as high as 47.27%. Thus, the hypothesis that the compliance of TRIPS Agreement coupled with strengthening of the S&T infrastructure would enhance patent filings by Indian as well as foreign applicants stands validated. It is noteworthy that the patent applications filed by the Indian applicants out-numbered the filings by foreign applicants in the financial year 2022-23 reversing the long standing past trend of higher filings by foreign applicants. This trend of higher filing of patent applications by Indian applicants is maintained in the subsequent financial years 2023-24 and 2024-25. Higher number of patent applications filed and patents granted in the sectors of food, drugs and chemicals in FYs 2005-06 to 2007-08, as presented in Tables 9 and 10 supports the second hypothesis that there would be significant rise in these numbers on allowing grant of product patents in all segments of inventions w.e.f. 1st January, 2005.

Thus the present study reveals that the TRIPS compliant Patents Act and changes in Patent Rules particularly the design of concession of fee structure, awareness created about patenting by Patent Office and other agencies, strong infrastructure and adequate resources have undoubtedly resulted in achieving significantly enhanced filing of patent applications by Indian applicants.

References

1 Anell L, Key Note Speech at the TRIPS Symposium, 26th February, 2015, available at www.wto.org/english/res_e/booksp_e/trips_agree_e/appendix_1_e.pdf, p. 368.

2 Kumar N, Discussion paper on IPRs, technology and economic development: Experience of Asian countries, RIS-DP#25/2002, available at https:/www.ris.org.in/images/RIS-images/pdf/dp25_pap.pdf.

3 RBI Publication, Report on Foreign Exchange Reserve under sub-title Adequacy of Reserves, 7th January, 2005, available at https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/59956.pdf.

4 Uppal J S, India's New Economic Policy, *Journal of Economic Development,* 18 (2) (1993), 45, *available at https://jed.cau.kr/archives/18-2/18-2-2.pdf.*

5 Japan Patent Office, Introduction to TRIPS Agreement, Asia-Pacific Industrial Property Centre, JIII, available at https://www.jpo.go.jp/e/news/kokusal/developing/training/textbook/document/index/TRIPS-Agreement.pdf.

6 The Patents Act, 1970, No. 39 of 1970, September 19, 1970, retrieved from www.advocatekhoj.com/library/bareacts/patents/index.php.

7 Gazette of India, Extraordinary, Part 11-Section 1, dated 26th March, 1999, The Patents (Amendment) Act, 1999, available

at www.ipindia.gov.in/writereaddata/Portal/IPOAct/1_34_1_patent-amendment-act-1999.pdf.

8 Gazette of India, Extraordinary, Part 11, Section 1, dated 25th June, 2002, The Patents (Amendment) Act, 2002, available at https://www.ipindia.gov.in/writereaddata/Portal/IPOAct/1_39_1_patent-amendment-act-2002.pdf

9 Gazette of India, Extraordinary, Part 11, Section1, dated 5th April, 2005, The Patents (Amendment) Act, 2005, available at www.ipindia.gov.in/writereaddata/Portal/IPOAct/1_69_1_patent-amendment-act-2005.pdf.

10 *Bishwanath Prasad, Radhey Shyam* v *H M Industries*, retrieved from AIR 1982 SC 1444 at paragraph17.

11 TIFAC Annual Report, 2022-23, 22.

12 Department of Biotechnology, Govt. of India, Annual Report, 2023-24, 168.

13 M/o Micro, Small and Medium Enterprises, Govt. of India, Annual Report, 2023-24.

14 Department of Science & Technology, Govt. of India, Annual Report, 2023-24.

15 Bhowmick A, Roy S D & De M, A brief review on the turmeric patent case with its implications on the documentation of traditional knowledge, *NDC E-Bios*, 1 (2021)83, ISSN: 2583-6447 available at https://www.ndcebios.in /v1n1/2021010110.pdf.

16 CSIR Unit for R&D of Information Products (URDIP) available at www.https://urdip.res.in.

17 Patent Office, National Intellectual Property Rights Policy, 2016; www.ipindia.gov.in.

18 Department of Science and Technology, Govt. of India, *R&D Statistics, 2022-23*.

19 Ministry of Finance, Govt. of India, 'The Economic Survey of India 2023-24', retrieved from www.https://vajiramandravi.com/upsc-daily-current-affairs/economic-survey.

20 Patent Office, Annual Report 2005-06, p. 5; available at www.ipindia.gov.in.

21 Ministry of Commerce and Industry, Department of Industrial Policy and Promotion, Annual Report 2016-17, p. 100, available at www.dpiit.gov.in.

22 Ministry of Commerce and Industry, DIPP, Annual Report, 2016-17 and Annual Reports of DPIIT 2021-22, page 60 and DPIIT 2023-24, pp. 62, 63 and 153.

23 Patent Office, web-site www.ipindia.gov.in.

24 Valeria A *et al*, In the name of TRIPS: The impact of IPR harmonization on patent activity in Latin America, *Research Policy*, 52 (2023) 104759.

25 Xuan Li, *The World Economy*, (2008) 1367, doi:10.1111/j.1467-9051, 2008.01133.x.

26 Esra D A & Serhat B, A tale of two systems: Comparative intellectual property rights management in Turkiye and the USA, *International Journal of Intellectual Property Management*, 15 (4) (2025) 404.

27 Patent Office, Annual Reports 2000-01 to 2024-25, www.ipindia.gov.in.

28 World Intellectual Property Organization, World Intellectual Property Indicators 2024, November 2024, https//www.wipo.int/endos/pubdocs/en/wipo-pub-941-2024-en-world-intellectual-propert-indicators-2024 (2025).

29 Kiran R, IPR Scenario and factors for promoting IPR culture, a post-TRIPS period analysis of selected pharmaceutical firms in North India, *Economic Research*, 30 (1) (2017) 873, available at https://www.tandfonline.com/doi/full/10.1080/1331677X.2017.1311223-d1e119.

30 Patent Office, Annual Report 2016-17, pp.18 and 23, available at www.ipindia.gov.in.

31 PIB Publication, Ministry of Commerce and Industry, '2023 Year end Review for Department of Promotion of Industry and Internal Trade (DPIIT)', available at https://pib.gov.in/PressRelease/FramePage.aspx?PRID=1990377.