GENDER DISPARITY IN THE INTELLECTUAL PROPERTY SECTOR: WITH REFERENCE TO THE GLOBAL AND INDIAN PERSPECTIVE

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ABSTRACT

Intellectual Property Rights play an important role in protecting and recognising innovations. It provides incentives to people to be more productive in the innovation section which helps a country in making technological advancements and overall economic growth. However gender disparity hinders the maximum usage of such laws as women made inventions are often overshadowed, stolen or sometimes they don't even get to start inventing due to societal pressure and discouragement. Women entrepreneurs and inventors often deal with systematic barriers like limited access to patent filing, lack of financial resources and limited legal knowledge. Historically women have been discouraged from entering into the STEM industry which contributes the most to the Intellectual Property Sector and thus we see less women contributing to Patents and such even to this day. Starting from an early age, women were treated as objects with no brain hence they weren't even allowed to own property let alone protect it. Which is why it is believed that thousands of women invented products or processes either did not see the light of the day or was patented or protected under a man's name as it was a very normal practice back then where women would get their creation protected under their father or husbands name. This article talks about overall gender disparity that women face in the Intellectual Property Sector, historical examples of women being overshadowed, societal barriers and steps taken to increase their inclusion and contribution. It also lays down descriptively how much women contribute to the Indian agriculture sector and how much contribution they make to promote grassroots innovations in India, it talks about how big the agriculture sector in India is and while women, who make up a large amount of manpower in the agriculture sector, get grossly overlooked. Both Global and Indian Perspective have been taken into account here.

Keywords: Intellectual Property Rights, Gender Disparity, STEM Industry, Women, Inventions

Introduction

Historically women were not able to work for their needs or development and even they had the chance to work then on multiple occasions their creations or creative writings have either been stolen or their patent been ignored. In the 17th century Many women did not earn money required to go through the lengthy and costly patenting process back then so they had to go through their processes through their fathers or husbands so it is unclear how many women made inventions were credited to their husbands or fathers. One such example of this is Sybilla Masters, who was the first resident of the American colony to get an English patent and possibly the first women inventor in America of European ancestry. She got her patent in 1712 for making a machine for cleaning and curing Indian corn. However the patent was given to her in her husband's name, Thomas Masters as women were not allowed to own patents or properties. ¹ After Sybilla many more women invented things or necessity that made living easy and innovative. However in the 1900s women were still seen as mere housewives and not valuable part of a developing society. Women were still not allowed to own property or file patent in the 19th or 20th century² by society even though legally they could so their inventions were still being credited to their male counterparts, fathers or husbands. Even if they were able to have their inventions patented, they were often excluded from professional networks and funding projects due to the invention being attributed to their gender. Men often tried to steal women's inventions citing their womanhood as a flaw, example of this is the invention of the "Paper Bag Machine" invented by Margeret Knight popularly known as Lady Edison which cut,folded and glued flat-bottomed paper bags which proved to be revolutionary for the packaging industry. However she had to fight to claim her invention in the court against a man named 'Charles Annan' who tried to steal margarets invention and made sexist claims against margaret claiming that she as a woman did not know the complexities that went into the working of the machine which were disproved by margaret as she provided her original blueprints of the machine. Margaret Knight won her patent case but manufacturers did not invest in her invention during that time due to them lacking trust in her invention due to her being a woman. It was much later that the machine actually started getting utilized by the industry; however by that time Margeret had lost royalties that would've come her way.³

¹Charlie Samuel, Inventors and inventions in colonial America 14 (2003).

² International Women's Day: Inventive Women, (Mar. 30, 2005), https://www.wipo.int/web/wipo-magazine/articles/international-womens-day-inventive-women-34732.

³ *NIHF Inductee Margaret Knight Invented the Paper Bag Making Machine,* (Dec. 14, 2022), https://www. invent. org/inductees/margaret-e-knight.

Another classic example of misogyny in inventive history is the discovery of DNA structure. Rosalind Franklin played a vital role in uncovering the helix structure of DNA, however her works were downplayed and she was attacked by Watson in his book which can be based on his personal misogyny. Watson also admitted in his book that he non consensually took Franklin's work that led him and Crick to discover the structure of DNA. She was also excluded from the list of Nobel prize winners because it isn't provided posthumously. She wasn't recognised for her work until her death when bits and pieces uncovered how Franklin was a victim of chauvinism and misogyny.⁴

In Indian perspective we do not have many instances or records where women fought for their parents because many didn't even know that they could even protect their inventions. The largest sector of India is the Agriculture Sector in which women workers exist in majority. PIB report of 2021-2022 stated that women made up about 62. 9 % of the agriculture sector, double the amount of men⁵. These women are mostly from rural areas who did not have any proper education and are involved in the agriculture sector because they have to and do not have other choice, it's a high possibility that they aren't even aware of Intellectual Property Laws in India and thus any product or process they develop in their daily life of working just lays around unprotected. The government has launched a lot of schemes to educate female farmers about their rights and how they can flourish further. There are many Self Help Groups (SHG) and Farmer Producer Organisations (FPO) to encourage women to get involved economically, but help does not always reach everywhere it's needed.

Gender Bias in intellectual property rights

As times have changed the barriers to securing IP rights by women have been drastically reduced and women's contribution to different industries are now seen as valuable however we are far from a completely neutral society. For example, looking at current day patent filings, the gap between male applicants and female applicants is quite vast and women are still absent from the patent system. According to WIPO data in march 2024, only 17. 7 %⁶ applicants named in the International Patent Applications were women and the rest 82. 3 % were men

⁴Sarah Pruitt, *Rosalind Franklin's Overlooked Role in the Discovery of DNA's Structure*, HISTORY (Mar. 25, 2024), https://www.history.com/news/rosalind-franklin-dna-discovery.

⁵Agriculture has highest estimated percentage distribution of female workers followed by manufacturing as per the Annual Periodic Labour Force Survey (PLFS) Report 2021-22, (Mar. 27, 2023), https://pib. gov. in/PressReleaseIframePage. aspx?PRID=1911142.

⁶ Patent Cooperation Treaty Yearly Review – 2024, https://www.wipo.int/publications/en/details.jsp?id=4740&plang=EN.

which shows the large gap. Compared to the year 2022, the percentage of women applicants rose by 0.6 % however the growth has been very slow and minimal. PCT has predicted that gender parity will not be possible in the patenting sector until the year 2077.

In 1978, women accounted for 27.9% in registered authorships which has increased tremendously in recent years as the prior percentage has gone up to 38.5% in the 2020s, giving us an increase of 10. 6%. Again, even accounting to the copyright data the growth has been slow in comparison to the population increase but at least there has been growth.

When it comes to authorship by work category, in textual work, the authorship registration increased to 45. 83% in 2012, however in music, female authorship remained very stagnant with men dominating the field by 75. 98% registered works, same in motion pictures where men registered 78. 16% copyrights while women had a small increase. Copyrights in software counted the least amount of female authorship with men dominating with 88.22% of registrations.

Indian scenario

In India, the gap is even bigger than the international one as between the years 2019-2021, only 10. 2% of total patents registered under PCT accounted for women. This is significantly lower than the international percentage where women accounted for 16. 2%. Projections show that gender parity in the IPR sector will be difficult to achieve even till 2061.

Factors that contribute to this disparity

 Cultural bias and gender norms: society seems to discourage women from going into the field of Science, Technology, Engineering and Mathematics (STEM) field and studies show that children as young as 6 year old associate such fields with boys⁷ rather than with girls, which instills the thought of non belongingness in these fields into girls. According to Namrata Gupta, in her book "Women in Science and Technology: Confronting Inequalities, she stated that statistics show that only 10-15% of STEM researchers in STEM public institutes like IITs. AIIMS, CSIR, PGIs etc are women and the number of women in R&D labs are even smaller⁸. Fatima Jabeen, a junior research fellow at zoological survey of India, Solan, HP stated that she has been continuously

⁷David Miller, *Tech Stereotypes Discourage Girls from Computing and Engineering as Early as Age 6, Scientific American* (Dec. 20, 2024), https://www.scientificamerican.com/article/tech-stereotypes-discourage-girls-from-computing-and-engineering-as-early-as/.

⁸ Namrata Gupta, Women in Science and Technology: Confronting Inequalities 224 (2020)

hounded for being a woman in this field as her job requires to travel to forest and get lodging nearby. Many discourage her saying this field is not safe for a woman.⁹

- 2. Legal and Financial Barriers: A patent is costly when added along with the attorney fees. A patent for an individual can cost around Rs 1,600 and attorney fees can cost up to Rs 35,000¹⁰. A lot of women in India cannot afford this as many are not in position at work to earn so much. Although the government has made many reservations and incentives for women to get high paying government jobs, many women are not able to take advantage of it because of them not getting a quality education. Moreover, a lot of contract based jobs do not hire married or pregnant women due to them having to give paid maternity leaves to such women. Many jobs even refuse to give such women a permanent position if they have future plans of getting married or having children¹¹. Uma (name changed) did her Phd in Molecular Biology and became an assistant professor at an affluent Central University in the North-Eastern region on contract basis. However when it came to become a permanent professor where her name was not there. It wasn't there despite her important contributions to the university. She got to know through the grapevine that her being the first woman at the university to take maternity leave might have affected the administration's decision to give her a permanent position¹².
- 3. Lack of awareness or mentorship: A lot of women in India do not know about intellectual property laws and are not aware that they can get it patented and get royalties. The same was reiterated by Justice Hema Kohli at the World Intellectual property Day celebrations at Delhi High Court where she said that women suffer a lot due to their gender in the IP sector where lack of awareness was one of the factors affecting women and it's especially a concerning thing in the rural areas.¹³

⁹Sudeshna Rana, *How Indian Higher Education Discourages Women In STEM*, (May 14, 2020), https://feminisminindia.com/2020/05/14/women-in-stem/.

¹⁰ Patent Costs in India https://www. lawrepublic. co/patent-cost-in-

india/#:~:text=The%20cost%20of%20patent%20in,%E2%82%B9%2035%2C000%20for%20Indian%20applica nts

¹¹ Muskan Tibrewala, Prannv Dhawan, *Pregnancy is still a barrier in accessing employment* The Hindu (Oct. 17th 2024) https://www.thehindu.com/opinion/op-ed/pregnancy-is-still-a-barrier-in-accessing-employment/article68759434.ece

¹² Divya Gandhi, *Indian Women enter STEM fields in record Numbers. But why do they vanish from academic positions* The Hindu (Nov. 6th 2024) https://frontline. thehindu. com/science-and-technology/women-stem-maternity-leave-phd-gender-bias-workforce-diversity-toxic-workplace-academia/article68836952. ece

¹³ Shagun Suryam, *Women in India face Unique Challenges in protecting their intellectual property rights* BarandBench (May 1st 2023) https://www.barandbench.com/news/women-india-face-unique-challengesprotecting-intellectual-property-rights-justice-hima-kohli

Cultural and Social Barriers in the IPR sector

- Gender bias in education and opportunities: Historically women has been discouraged from entering into the STEM field, fields which are heavily linked with patents and copyrights because such fields were mostly male dominated and even when they did enter such fields of education they were taken seriously there. A study done by Biaswatchindia¹⁴ stated that the representation of women in India is lowest in the engineering department with 9. 2% while the highest representation sits at 25. 5% in biology. The reason for this can be because biology is seen as a "soft science" "suitable" for women.
- 2. Workplace discrimination and male dominated networks: The patent and innovation sector has been heavily male dominated as at earliest times women were not even to even get their inventions patented due to underlying misogyny of women not being allowed to own properties and hence women used to get their inventions patented under their fathers or husbands name. As times progressed, the situation has improved but the industry is still heavily biased against women as according to the Stanford school of Business¹⁵, the entry level salary for men is \$4,000 dollars more than women on the basis of the same qualifications. A paper published by the Pew research center,¹⁶ it was stated that men earn 40% more than women in STEM. This is a grave issue as because of such reasons a woman may not be able to afford patenting their inventions.
- 3. Legal and institutional barriers: As already stated above, one of the first barriers for women in the IP sector was that the legal framework back then didn't allow them to get their inventions or ideas protected because of prevailing misogyny.
- 4. Stereotypes in the IPR Sector: It is a well perceived stereotype that men are more innovative and technologically advanced than women. A study done by Lynne Millward and Helen Freeman¹⁷ found that while men and women are equally innovative differently due to their gender role. Men are perceived more as innovative while women are perceived more as adaptive and while adaptive is not a bad thing to be, it boxes

¹⁴ Base rates of STEM women faculty in India Biaswatchindia https://biaswatchindia.com/base-rates-of-indianwomen-faculty/

¹⁵ Corey Binns, *What's Behind the Pay Gap in STEM* Stanford Business (Feb. 19, 2021) https://www.gsb. stanford.edu/insights/whats-behind-pay-gap-stem-jobs

¹⁶ Richard Fry, Brian Kennedy, Cary Funk, *STEM jobs See Uneven Progress in Increasing Gender, Racial and Ethnic Priority* Pew Research Center (April 1st 2021) https://www.pewresearch.org/social-

¹⁷ Lynne Millward, Helen Freeman, *Role Expectations as Constraints to Innovation: The case of Female Managers* ResearchGate (Jan. 2002) https://www.researchgate.

net/publication/233071557_Role_Expectations_as_Constraints_to_Innovation_The_Case_of_Female_Managers

women in a field of just "following" instead of having their own individual innovative ideas to act upon. Their study also found that men are expected to be risk takers as compared to women while being innovative and less pressure is put on them in case of failure as opposed to which women are supposed to be perfect while acting upon their ideas and their failures are met with disdain.

Steps Undertaken to promote Female participation in IPR Sector

While historically women have been discouraged in the IP owning sector and there are several barriers to that in the present time as well, multiple steps have been undertaken by governments worldwide to increase female participation and give women an incentive to be creative.

- WIPO has been the leading entity to promote female welfare when it comes to the IPR sector where they started the "IP for Women Entrepreneurs programme" where they provide research and mentorship for women in securing trademarks, copyrights, patents etc. They've also opened Technology and Innovation Support Centers (TSICS) to provide training to women.
- 2. Patent Cooperation Treaty (PCT) has taken many initiatives such as fee reduction and other incentives to women led patent application so as to increase female visibility in the patent sector.

India Specific steps

- With the Patent (amendment) rules 2020, the government took a step to encourage more women to file for patents without feeling financial burden by adding a 50% fee reduction in patent filing for female inventors.
- 2. Niti Aaoyog's Women's Entrepreneurship Platform (WEP) helps provide women training and mentorship regarding intellectual property rights and it also helps women led startups acquire patents and trademarks
- 3. Start up India scheme announced in 2016 was launched to help provide speedy examination of patents for startups including women start ups. It also provided free legal assistance in IPR filing.
- 4. The National IPR policy of 2016 recognised the need for women participation in the IPR sector, it encouraged Indian universities to help encourage women to join the STEM sectors so as to increase filings of patents by women.
- 5. Another one of India's schemes is a decade-long running scheme called KIRAN

(Knowledge Involvement in Research Advancement through Nurturing) where women can re commence their career in Science and technology which further helps them in contributing to IP generation and commercialization.

Conclusion

The convergence of Gender and Intellectual Property shows the deep rooted disparities all across the globe that women face. Historically women were discouraged from being inventors and even when they invented they were not allowed to own it and put their names on their inventions. Now decades later things have improved due to the efforts of many women and allies in history and legal frameworks have strived hard to ensure the equal inclusion of women in the Intellectual Property sector but the result is still far from optimal. Especially in India many still exist with a backward mentality, women still face issues in the STEM area and many still have limited access to patent and other IP rights.

Efforts on global and national levels have been taken to bridge the gap between men and women in the IP sector but we are far from bridging that gap. To foster a more united IP sector more reforms, rules, stricter inclusionary framework is needed. Higher education institutes should strictly adhere to a neutral approach to encouraging both male and female students interested in the STEM sector and no backward mentality should be perpetuated. Access to patents should be made easier and less costly, actions to be taken against infringement should be made easier and the punishments more stringent, which lead to unlocking the full potential of female inventors.

A gender inclusive Intellectual Property Law Framework is not just desperately needed but is also crucial for overall economic growth and technological advancements.