# Issues and Challenges faced by Women Innovators




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**Final Approval of Thesis**

This is to certify that we have read the thesis submitted by Mr. Muhammad Naseer. It is our judgment that this thesis is of sufficient standard to warrant its acceptance by the Quaid-i-Azam University, Islamabad for the award of the Degree of M. Phil in Anthropology.

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This research work is an attempt to explore why women innovators are unable to convert their valuable research and inventions into commercialized products. Despite all their successes in academic and research fields, they are unable to protect their Intellectual Property to get economic gains. Why they are not contributing in the growth of knowledge economy. One of the aims of this research was to find out a workable solution to address this issue and encourage women entrepreneurship in Pakistan. This research work was undertaken on the motivation, inspiration and encouragement of my supervisor, Dr. Aneela Sultana. It was her continuous support and guidance which resulted in the completion and submission of this thesis. I would also like to extend my gratitude to all my teachers especially Dr. Inam ullah Leghari, Dr. Rao Nadeem Alam, Dr. Ikram BadShah, Dr. Saadia Abid, Dr. Waheed Choudhary, Dr. Waqas Saleem and Dr. Huma Haq.

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# DEDICATION

*"With profound and warmest regard, I dedicate this work to Mr. Muhammad Irfan Tarar, who has been always a source of inspiration and a role model for me."*

# ABSTRACT

Innovation and creativity have become engine of economic and social growth around the globe. But innovative culture cannot grow without a balanced and equitable system of protection. Intellectual Property (IP) system provides this protection and hence push the growth of knowledge economy and entrepreneurship. However, desired level of economic development cannot be achieved without empowering women. In countries like Pakistan women entrepreneurship could not grow despite all their successes in academic and research fields. Women inventors and innovators could not use IP system to protect and to commercialize their innovative products. The purpose of the research was to unfold the societal and institutional discrimination inhibiting women entrepreneurship in Pakistan leading to deaccelerating economic development. Qualitative tools were used for the research. Interviews, semi-structured interview were conducted to collect data which was analyzed to solve the problem statement. Locale of research was IPO Pakistan and the subject of research was kept to protection and commercialization of inventions and innovations of women in Pakistan. It has identified factors either personal, institutional, policy level, societal or cultural which create hindrance to protect their IPRs and to get economic benefits of their rights. This research also aims to find out a workable solution to address this issues and challenges of women innovators and encourage women entrepreneurship in Pakistan. Furthermore, by promoting innovative culture among women would not only improve the economic growth but also bring the much-needed social change.



**Keywords**

*Innovation, Women Empowerment, Entrepreneurship, IP System, Intellectual*

*Property Rights, Economic Development, Social Change.*

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# CHAPTER NO. 1

# INTRODUCTION

Human resource is a vital component of an economy. An efficient and capable human resource is a basic requirement for economic and social development in a society. At the same time, 49.6 percent of global human resource is comprising of women. (World Bank 2021) They are making critical contribution in development of countries around the globe. However, their representation in the businesses is quite low even in the most advanced economies. For example, only 17 percent startups are owned by women in USA. (IWWG 2017). There are a number of reasons for this gender gap in businesses. One of them is lack of awareness and support system for women inventors and innovators. Intellectual Property (IP) plays a key role in success of an entrepreneur. It helps the innovators to protect and to have economic benefit of their inventions and innovations. The IP rights give them opportunities to start their own businesses or to establish partnerships or give licensing for the innovative product or process.



However, it is a proven fact that women use IP system quite less compared to men despite all their successes in academic and research fields. It is evident from the fact that out of total Patent filling with WIPO through Pakistan Cooperation Treaty (PCT) only 4.3 percent came from women (WIPO 2021). It would be an interesting and useful study to investigate this gender gap in patenting. By addressing the issues and challenges of women innovators and by improving the support system for them, the issue of gender gap can be addressed resulting in enhancing contribution of women in economic and social development in countries like Pakistan.

In fact, innovation and creativity have become engine of economic and social development in a contemporary and ever-changing world. No country can grow without

providing a conducive and equitable environment to the people to innovate and to create ideas and inventions. Besides the western developed nations, the phenomenal economic growth of countries like Japan, South Korea and China was the result of innovative culture created by the nations. Innovation can be defined in various ways but the basic meaning is "a creative thinking that creates value" Adriana DIMA (2021). Innovation is a new idea or a process or a service or a strategy that leads to development of a new product or service or a solution.

Various definitions of innovation are available in modern literature. Some are mentioned below:

i. Tidd & Bessant (2020) "Innovation is a process through which opportunities turn into ideas put into practice"
ii. Schilling & Shankar (2019) "The way an idea is implemented in a business process"
iii. Verdin & Tackx (2015) "Creating a new value in a creative way"
iv. Katzy et al. (2013) "Marketing a product, service, process or idea or changes to existing products"
v. Baregheh, Rowley & Sambrook (2009) "A multi-stage process by which companies turn their ideas into products, services or processes in order to have an advantage over the competition and the market".
vi. Porter & Stern (2001) "Transforming knowledge into products, services or processes"

In Pakistan women have to face difficulties in starting businesses. Their innovations are sometimes undermining and male folk get benefits from their innovative products due to societal infrastructure. However, this study will make the reader to understood

problems of women innovators in economic participation, societal values, regulatory issues, helping organizations and institutions for economic development and most importantly the products developed by them have no Intellectual Property Rights (IPRs). They seldom have opportunities to grow and market their innovative products. They have to seek support from men to protect their IPRs and to get desired economic benefits of their innovation. The study also aims to explore why women innovators were not utilizing government facilities to launch and to protect their own innovative products in the market. For the economic growth of the family as well as of the country, commercialization of these innovative products is imperative.

At the same time, the innovation culture cannot grow in a society without a balanced and equitable system of protection. In fact, innovation and creativity leads towards the creation of intellectual property in an economy. There are different kinds of Intellectual Property Rights (IPRs) like patents for inventions, trademarks for logos, copyrights for artistic works, designs, geographic indications for regional products etc. Protection of IPRs will further encourage the culture of "to create and to innovate". For this purpose, different countries have established different institutional arrangements. At international level a United Nation agency World Intellectual Property Organization (WIPO) was established to coordinate and to facilitate the countries for provision of an effective and efficient protection system for IPRs. Intellectual Property Organization of Pakistan (IPO Pakistan) was established by the Government of Pakistan in 2005. However, Pakistan could not provide desired level of protection for IPRs that could encourage creative and innovative culture in the country. Especially, it failed to address issues and challenges faced by women innovators. Resultantly, women folk could not contribute to the development of knowledge economy of the country despites their phenomenal successes in the academic fields. An investigation is required to find out

those issues and challenges which are being faced by women hindering their ways to make progress. Therefore, main aim of this research to find out the issues and challenges of women innovators and to propose some equitable solution while examining the current institutional support in Pakistan.

This study has been initiated to discover the influence of the cultural and social variables on the barriers to women innovators in Pakistan, generally, the study explores the main barriers which are faced by women innovators who tend to be entrepreneurs in Pakistan and wanted to launch their products and other way round why they were not using the government channels for protection of their IPRs to get the desired economic benefit. No country can progress without active participation of women in the economic activities and in the emerging global knowledge economies. Pakistan would be left far behind if women innovators are not provided encouraging environment and equitable opportunities to grow and to contribute in the economic growth of Pakistan.

To encourage women innovators to protect and to commercialize their products, it is imperative to understand the problems faced by them in using the IP system. This understanding will lead to diagnosing a support system for them aiming to bridge the gender gap and encouraging women entrepreneurship. Therefore, this research was undertaken. However, to keep it focused and workable, it has been confined to IP system of Pakistan. An attempt has been made to find out issues and challenges being faced by Pakistani women innovators and some solutions have been recommended to address them.

## 1.1. Statement of the Problem

Skilled human resource is a vital ingredient for social and economic growth of a country. Almost half of the human resource is comprising of women in every economy. Therefore, the desired level of development cannot be achieved without the active participation of women. Innovation has become hallmark of global knowledge economy and protection of Intellectual Property Rights (IPRs) has become imperative for survival in the business. Unfortunately, in countries like Pakistan women entrepreneurship could not grow despite all their successes in academic and research fields. Women inventors and innovators could not use IP system to protect and to commercialize their innovative products. Discriminatory environment for women in Pakistan is not only hindering their progress in the economic sphere but also discouraging them to create and to innovate. The research intends to identify those factors either personal, institutional, policy level, societal or cultural which create hindrance to register and to protect their IPRs and to get economic benefits of their rights. It is necessary to understand the problems being faced by them in using the IP system. This understanding will lead to diagnosing a support system for them aiming to bridge the gender gap and encouraging women entrepreneurship.



## 1.2. Objectives

The Research was undertaken to unfold the societal discrimination inhibiting women entrepreneurship in Pakistan leading to deaccelerating economic growth in the country. The purpose of the study is the exploration of the issues and challenges being faced by women innovators in protecting their products and getting economic benefits from their innovations. One of the aims of this research was to find out a workable solution by

addressing these issues and challenges and encourage women entrepreneurship in Pakistan. The major questions for inquiry are;

a. To document societal and cultural factors hindering IP protection of women innovators.

b. To identify those Government organizations working for the provision of protection to women innovators and

c. To find out causes of slow growth of women entrepreneurship in Pakistan.

## 1.3. Research Questions

Q1: How women innovators are using existing IP infrastructure in Pakistan?

Q2: What are the different barriers that women face in the registration of their IPRs?

Q3: What are the issues and challenges of women innovators to protect and to commercialize their innovations?

Q4: To what extent socio-cultural factors contribute to encourage or to inhibit women innovators to commercialize their inventions and innovations in Pakistan?

Q5: What are the major initiatives in the country designed to support women innovators?

Q6: How the problems of women innovators can be addressed?

## 1.4. Significance of the Study

It would be an addition in literature of anthropology unfolding the hindrances being faced by women on the way to progress. How family system and social set up in Pakistan is baring them to achieve economic independence. It increases my knowledge and understanding of issues and challenges being faced by women innovators. I could explore why women innovators failed to get economic benefits of their inventions and innovations. It will provide some solution to them to provide conducive and favorable environment to women innovators so that they can contribute in the economic growth of country. Therefore, it will be a handy document for the policy makers. This study will also enhance awareness among the women and encourage them not only to innovate but also to get economic benefits from their inventions and innovations. It will be also helpful for them to understand the national and international institutional framework which provide protection to their inventions and innovations. It gives a complete picture of registration process of an innovation in Pakistan.

This study will be useful for the policy makers and public sector organizations while devising any policy instrument for the promotion of IP culture and women entrepreneurship in the country. The findings of the study are based on the primary data collected from IPO Pakistan and inputs from all the major stake holders. It identifies the problems being faced by women in a male dominated social and institutional set up. Lack of awareness and access to financial and technical resources have resulted in a huge gender gap in the business environment of the country. Social setup especially, the culture of the confinement of women in four walls has inhibit the women entrepreneurship in the country. It also pointed out that it is hard for women innovators to make use of the national and international financial and technical incentives.

It also helps NGOs to introduce different programs for the promotion of women in business. They can encourage women innovators to register their inventions and innovations. They can offer financial and legal support in this regard. They can be instrumental in establishing linkages between women innovators and industry. The study encourages them to provide a platform to the women innovators in finding investors or business partners.

The research study will be an addition to the academic literature. Student and researchers will have access to the primary data and information about the IP System of Pakistan. They will understand the hindrances on the way to commercialization of an invention. The study will also be a source of reference of the teachers and instructors. It also pointed out the importance of IPRs that need to be taught at school as well as college level.

This study provides an insight to the underlined root cause the tendency among women inventors of not applying for registration of their inventions. The data analysis reveals the factors of least applications for registration from women despite all their increasing successes in academic and R&D institutions.

This research hints the roots of low level of innovation in Pakistani society including poor policy making, obsolete institutional framework, shyness to adopt modern and emerging technologies, copy culture, gender discrimination and lack of research in academic institutions. This research also proposed a solution to improve the situation in Pakistan by bring and encouraging women innovators. It would require a holistic approach to bring institutional and social reforms. But a few steps taken by IPO Pakistan would be very instrumental as a first step.

The study also indicates the role of WIPO as an UN Agency in promoting women innovators in the developing countries. It also shows some best practices introduced by some countries like India, Philippines and South Korea that need to replicate in Pakistan. The study also identifies the financial and technical support offered by WIPO in the registration of invention in different countries. An introduction to Patent Cooperation Treaty (PCT) managed by WIPO is very useful for the researchers. The study also tells us about some of the new initiatives taken by WIPO with the cooperation of IPO Pakistan and HEC to promote the innovative culture in Pakistan.

It will unfold that how gender discrimination is hindering the economic growth whereas women empowerment can be instrumental in this regard. By promoting innovative culture among women would not only improve the economic growth but also bring the much-needed social change. The change to accept women equal human being with the equal rights to grow and participate in all sphere of life. Above all the study encourages women to register their IPRs and get due economic benefits from their innovations.

# CHAPTER NO. 2

# LITERATURE REVIEW

Investing in women is not only the right thing to do but the smart thing to do (Ban-Ki-Moon, 2008). A large number of women has entered in the labor force but not been treated as equals to men. They earn less than men and have less opportunity for growth (Goldin, 1990).

Not much has been written on this subject. Most of the available literature is either on women empowerment or women entrepreneurship. Even we seldom find a piece of literature in the form of research article or book in the corporate anthropology domains. Ironically, the researchers have skipped the dichotomy of our society in which although women are performing exceptionally in the fields of academic and research yet their presence in the field of entrepreneurship and businesses is very trivial. They are inventing and innovating products through their research work but cannot commercialize them. They seldom enjoy the fruit of their hard work. There is a need to investigate this aspect of women inventors and innovations to find out the issues challenges on their way to gain economic benefits for their innovations. Why they are not contributing to the ever-expanding knowledge economies. The digital age is offering a lot of opportunities for the conversion of their innovative ideas into a commercial activity. But they are not grasping the openings. Resultantly, their contribution to family income as well as national and global economic growth is nominal. Further, this research would be a good addition not only in the corporate anthropology but also unfold the socio-cultural factors contributing to encourage or to discourage women innovators to commercialize their inventions and innovations and grow in businesses in Pakistan.

It is pertinent to mention that a very little has been written on this aspect of women folk even in the advanced societies. Corporate anthropology is full of literature on the causes of failure of women in trade, businesses and innovations, on the problems being faced in male dominated societies, on the issues and challenges of women empowerment etc. Most of the articles and books cover large spectrum of role of women in society, politics, culture, trade, businesses and family life. A very little is available on the role of women in innovation and entrepreneurship. However, a study jointly conducted in 2010 by World Bank and International Women Working Group (IWWG) it "identified the lack of information, the lack of supportive networks and the lack of knowledge among the factors contributing to the gender gap with respect to business incubation." (World Bank 2010). The IP system plays a vital role in the growth of knowledge-based economy. It stimulates innovations and inventions and promote innovative business. The inventors or innovators can monetize their creations with the help of IP protection. Two other studies on the use of IP gender gap are also available. These studies were conducted in 2016 by WIPO and UKIPO. It has been observed in these studies that women use IP system less as compare to men. In the first research study on "Identifying the gender of PCT inventors", conducted by World Intellectual Property Organization in November 2016 nine million patent applications filed through Patent Cooperation Treaty were examined. "Research clearly shows that women engage in the IP system less than men. For instance, in 2015, only 29 per cent of patent applications worldwide had at least one-woman inventor, and only 4.3 per cent came from women-only inventors, highlighting the extent of the gender gap in international patent filings." (WIPO 2016)

In another research work undertaken by UKIPO in the same year titled "Gender Profiles in Worldwide Patenting: An analysis of female inventorship" about 59 million patents

were analyzed to see the gender gap in IP applications. These studies identify the gender gap in use of IP System and also point out the slow growth of women innovators but they are silent on the root causes of this slow growth and less participation in the economic growth. Although some factors like lack of awareness and lack of support system have been pointed out for this gender gap yet there is a need to explore real issues and challenges faced by women innovators in using the IP system.

No research work has been undertaken on the gender gap in the use of IP system. However, a lot has been written on the women empowerment and on the development of women entrepreneurship. One such studies is "Women Empowerment and Economic Development-An Exploratory Study in Pakistan." written by Mariam Sohail, a Research Scholar at Superior University, Lahore. The research study was conducted in 2014 with the aim to find out whether women empowerment can contribute towards economic development in Pakistan. Research was conducted on the 30 successful women working in different fields including education, banking and transportation etc. "Often contributions of women in the economy are ignored, and their work is underestimated. Gender discrimination reduces the chances for the women to eliminate poverty and to improve their lives." (Sohail, 2014) The role of successful women in different sector has been discussed in this research work. Most part of the research has been devoted towards women empowerment. It also encompasses role of women in economic development. But the innovation sector has not been touched despite the fact that in this digital age no economy can grow without innovations. In the end different recommendations have been illustrated for women empowerment. But there is no recommendation that relates to women innovators.

Another research work is worth mentioning. It is written by Adriana Dima under the title "The Importance of Innovation in Entrepreneurship for Economic Growth and Development. A Bibliometric Analysis." This research work was published in "Review of International Comparative Management." Volume 22, Issue 1, March 2021. Dr. Adriana Dima is a faculty member and a research scholar in the Bucharest University of Economic Studies in Romania. According to her "The evolution of entrepreneurship in recent year's offers strong arguments regarding the role of entrepreneurial initiatives to stimulate economic growth and development and innovation has proven an essential tool for entrepreneurs." (Dima, 2021) In her research different articles and research work written during 2000 to 2020 on the role of innovation in economic development have been reviewed. Importance of entrepreneurship in the modern age has been discussed at length. The changing characteristics of economic and social development due to innovations have also been discussed. In addition, the problems faced during the commercialization of an innovation has also been mentioned. However, the main focus of the researcher remains on entrepreneurship and its impact on economic development. In her words "The aim of this paper is to help scholars to have a wide perspective of the link between innovation and entrepreneurship in generating economic growth and development." (Dima, 2021)



While analyzing 598 papers written during 2000-20, she could not find a single work focusing on the role of women innovators in economic growth and development.

There is a need to undertake a research study with the aim to find out the root issues and challenges of women innovators in using the IP system and in contributing towards the economic growth of Pakistan.

# CHAPTER NO. 3

# RESEARCH METHODOLOGY

The descriptive method of research has been adopted. Both qualitative and quantitative approaches have been used to gather necessary data and to interpret and analyze it. Qualitative tools have been used for the research. Interviews, semi-structured interview have been administered to collect data and information. The case study methods have also been used to understand the issue and challenges of women innovators and inventors of diverse economic fields. Conceptual model was also developed to add anthropological theories from corporate anthropology domains. The research is primarily based on primary data. However, for the better understanding of the subject selective structured and unstructured interviews were also conducted. Representatives from different stakeholders including IPO Pakistan, Law Firms, Offices of Research, Innovation, and Commercialization, (ORIC)s, Technology Innovation Support Centers (TISCs), National Incubation Centers, Trade bodies, Pakistan Council for Scientific and Industrial Research, lawyers Association in Karachi and Lahore, lawyers working in the field of IP at Karachi, Lahore, and Islamabad. Women inventors whose inventions were patented or who did not apply for patent were approached for this purpose.



The methodology for the study included open-ended structured questionnaires, Focused Group Discussions (FGDs), individual face to face interviews and communication through emails, Short Message Services (SMS), and telephonic calls. The researcher has been working in IPO Pakistan at a higher post. It gave him an advantage to collect data and information. Researcher was able to approach relevant national and international organizations and the resource persons to obtain basic information and data. He was able to collect data from WIPO, UKIPO, USPTO, IPO Pakistan, research

and development institutions and academia. It helps the researcher to solve statement of problem in an organized way.

## 3.1. Anthropology and IPRs

Before explaining the method and tools applied for conducting this research, it is imperative to mention linkages of Anthropology with Intellectual Property Rights. A student of Corporate Anthropology is well aware of the fact that protection of IPRs has become vital for growth of business. The basis of knowledge economy is creativity and innovations which only nurture in a protected IP environment. Moreover, changing patterns of economy as well as society have roots in IPRs. The world is moving from trading of goods to trading of ideas. A registered software earns more than a hector of land earns from producing grains. How an anthropologist can ignore this change in human history. Furthermore, gender gap and women empowerment have become favorite topics of study in Corporate Anthropology. These issues cannot be understood without studying IP system and its role in development of entrepreneurship.

IPRs are an important component of the changing pattern of society as well as of economic landscape of a culture. Everyday advancement in technology provide basis for the emerging businesses. The epidemics like Covid 19 has further speedup the buying pattern of people. Online shopping has become norm of every society. It has also help in addressing the issue of gender gap in businesses. However, development of all technology bass businesses requires IPR protection. Therefore, development of entrepreneurship, empowerment of women and emerging trends in society cannot be understood without studying IPRs. Hence, IPRs are essential part of anthropology especially of the corporate anthropology.

Different tools and techniques adopted by the researcher to conduct this study have been elaborated in the subsequent paras.

## 3.2. Participant Observation

Participant Observation is a qualitative research method in which the researcher not only observe the research participants but also actively engages in the activities of the research participants. He becomes the part of activities and not only record the observations. His notes describe events and impressions. It provides in depth and richness of understandings of events and activities. There are four types of Participant observation including Passive Participation, Moderate Participation, Active Participation and Complete Participation.

Keeping in view the professional background of Researcher, he was able to use the Participant Observation tool in his research. He was working at the higher position in IPO Pakistan that provided him the opportunity to use all four types of Participant Observation. He was able to study and to acquire knowledge of IPR management in Pakistan in general and issues related to women innovators in particular. Participation observation helped him in the situation analysis and devising some workable solutions to address issues and challenges of women innovators in Pakistan.

Other methods and tools applied by the Researcher were as follow:

## 3.3. Key Informants

“Key informants are the individuals with whom the research begins in data collection because they are well informed, are accessible and can provide leads about other information” (Gilchrist, 1992).

Selection of key informants has to be done very carefully because their inputs are the basis of research. They need to be informed about the purpose of the research. It is important to win their confidence to get desired help from them. They are not only instrumental in data collection but also plays vital role in connecting further with the right people. They are also a link between the researcher and his sample. Following key informants were selected for the current research work.

Mr. Mujtaba Kamal was first key-informant of the researcher; he is a Patent Examiner working in IPO Pakistan. He had under taken a number of national and international trainings on Patent as well as other IP related issues. He had a good command on the IPR management in Pakistan. He helped the researcher in many ways, he knows a number of women innovators who applied for Patent registration in Pakistan. He was instrumental in arranging interviews with the women innovators. Saima Kanwal was the second key-informant; she is an Assistant Controller, in Patent office in Karachi. She helped the researcher in data collection in many ways. She is well respected lady and has a network of women innovators in academic and research institutions. Mr. Fayyaz Ahmed was the next key-informant who is a Controller of Patent Office. He knew the issues and challenges faced by the innovators in the country as well as abroad. His experience and knowledge about the subject were very helpful in the conclusion of this research work. Ms. Arooj Fatima another Patent examiner working in IPO Lahore office was instrumental in arranging interview of women innovators hailing from Punjab.

## 3.4. Sampling

"A sample is a segment of the population selected to represent the population as whole" (Kothari, 1985). "You are better off with the sample than the whole population and a good sample is a good sampling frame" (Russell, 1940).

Sampling is one of the main tools in the research to cover the whole population without studying the whole population. The researcher has selected a sample of women innovators and inventors. It is not possible to approach all the women innovators and other stakeholders, therefore, by using the "Purposive sampling" method, the required respondents were identified. It was followed by use of "Snow Ball Sampling" technique. It helped in collection of important data and information. In this research 35 women innovators and entrepreneurs were selected. There were three main sampling units. First, comprising of those women innovators who applied for patenting. (There were two sub categories of this unit. One who were granted Patent and second category was those who did not pursue their case.) It was selected to find out the problems faced by them in filling application for Patent and difficulties faced by them in granting them patent. Second, those women who did not apply for patenting. This sample was selected to investigate the reasons for not protecting the hard work and other resources putted by them in their research. Last, unit includes women entrepreneurs. The said sample was selected with the aim to explore the motivations for commercialization of their innovations and inventions. Reasons of success or failures were investigated. Incentives and national framework for commercialization were also considered by the researcher.



## 3.5. In-depth Interview

"More or less open-ended questions are brought to the interview situation in the form of an interview guide" (Flick. 1998).

Researcher used this method to get the right information and details from the respondents. Total 35 interviews were conducted from different respondents. Researcher used the interview guide to investigate statement of the problem and to find out answers to the questions under investigation. Three kinds of interviews structured, semi-structured and unstructured interviews were conducted. At the same time the semi-structured interview guide provided a clear set of instructions for interviewers and provided reliable, comparable qualitative data. The inclusion of open-ended questions made the research more valuable. Further, using of probing and prompting was helpful to get in depth data. Probing discussion led to the creation of many further questions from one question.

## 3.6. Focused Group Discussion

This tool was very useful especially during data collection from the organizations. Discussion with the group of four to five people always provide valuable information. Seven discussion session with different groups held during the research work.

## 3.7. Notes Taking

Research ensures to take notes during the interviews and Focused Group Discussion. It was helpful for him in preserving data. It also helps him in organizing information and analysis of data.

## 3.8 Recording

During some important interviews audio recording was also used with the permission of the interviewee. It helps the researcher in preserving important data.

Sources of Data:

Besides the research method and tools mentioned above it is imperative to mention that the sources used by the researcher to collect data and other relevant information include Intellectual Property Organization (IPO), Pakistan, at Islamabad, IPO Regional Office Lahore, Punjab, and IPO Karachi, Sindh, Law Firms, women inventors whose inventions were patented or who did not apply for patent were also approached. Offices of Research, Innovation, and Commercialization, (ORICs) established in different universities, Technology Innovation and Support Centers (TISCs), National Incubation Centers, Chamber of Commerce and Industry (both general and Women Chamber of Commerce and industry. The Researcher visited ORICs and TISCs to have FGDs on problems faced by women innovators in using of the IP system. Based on the quality of responses during the FGDs, individual interviews with Key Informants, were also conducted. The respondents also included those women inventors who are not using the system to determine why they are not using the system and thus what is not working in the system; Those women inventors who are applying for patents for their inventions and being granted or not granted as the case may be. If not being granted then reasons; Those women who have been granted patents and who are not taking it further to market and if so then reasons, and those women who have been granted patents and who have taken it to market and have applied for other IP rights such as trademarks and designs for market entry. To substantiate his research findings Researcher also developed case studies of three women inventors who have successfully taken their invention to market and who have made effective use of the IP system.



## 3.9. The research Locale

Locale of research was not geographical rather it was organizational and the subject of research was kept to protection and commercialization of inventions and innovations

of women in Pakistan. Researcher's main locale was IPO Pakistan. Women innovators who have applied for patents. Researcher has selected them because those women have completed their research and either tried to get protection for their innovations or not appley for the same due to discouraging IP environment in the country. Some of them also tried to commercialize their products facing different issues and challenges which are the main purpose of this research. However, women working in academia and other research institutes were also approached to substantiate the findings of the research to make it more beneficial. Other stakeholders include Law Firms, Offices of Research, Innovation, and Commercialization, (ORICs), Technology Innovation and Support Centers (TISCs), National Incubation Centers, Chambers, Pakistan Council for Scientific and Industrial Research, lawyers Association in Karachi and Lahore, lawyers working in the field of IP at Karachi, Lahore, and Islamabad. Women inventors whose inventions were patented or who did not apply for patent.

Although main locale of the research was IPO Pakistan yet research was also conducted in other public sector as well as private sector organizations as mentioned above. It provided in depth knowledge and information about the protection of innovations and issues of their commercialization in Pakistan. These organizations were helpful in elaborating the issues and challenges being faced by women inventors in Pakistan. This locale provided required data for situation analysis and for devising some workable solutions to address the issues and challenges of women innovators.

# CHAPTER NO. 4

## Institutional Setup for Protection of Intellectual Property Rights

In a highly competitive world, a world where former Chinese President Hu Jintao famously remarked that future wars will be fought on Intellectual Property; on ideas and on innovation, and one can see this from the Huawei case, the hypersonic missiles; to name a few. The role of IP is critical in national development and national security; both economic and defense. A stable IP environment becomes a magnet for future creativity and innovation; an avenue for the burgeoning youth of Pakistan. It also places the country in a positive light for the international investors because it accords an image of development and sophistication. A country that creates and innovates will succeed. A country that does not and does not have a strong IP base and IP organization will always be having borrow and to buy from abroad or from elsewhere.

Therefore, efficient management and effective enforcement of IPRs is directly linked with national economy and image of fair practices and the business acumen, in line with global standards of a country. The role of IPO-Pakistan is vital in effective administration of IPRs. It is important to mention that no country can grow without active participation of women in all economic activities. They are comprising of half population of the country. How Pakistan can grow without active participation from them. IPO Pakistan has failed to provide the much-needed support to the women innovators. There is no separate support system for women innovators that facilitate them to register and to protect their inventions and innovations. They hardly can escape from the financial exploitation of legal firms for the registration of their IPRs.

## 4.1 About IPO-Pakistan

IPO-Pakistan is an autonomous Federal Government Organization working under the administrative control of the Ministry of Commerce (MoC). It is responsible for the administration and management of Intellectual Property (IP) in the country. IP refers to creations of mind such as; inventions, literary and artistic works, designs and symbols, names and images used in commerce (WIPO 2022). IPRs are the rights given to individuals for their creativity and innovation. They give the creator an exclusive right over the use of his/her creation for a certain period of time (WIPO 2022). There are different kinds of IPRs including Copyright, Trademark, Patent, Industrial Design, Integrated Circuits and Geographical Indications. IP is now the most valuable asset in knowledge-based economies and its importance is increasing exponentially in rapidly advancing digital age. Centre of wealth creation has been shifting from tangible assets or physical capital to intangible assets or intellectual capital (Gurry 2020). That is why the Trade Related Intellectual Property Rights (TRIPs) Agreement of the World Trade Organization (WTO) requires its member states to adopt measures to protect IP Rights of the domestic as well as foreign creators. The World Intellectual Property Organization (WIPO) is the global forum for IP services, policy, information and cooperation (WIPO 2020).

To fulfill international obligations, IPO-Pakistan was established as an autonomous body on April 08, 2005 under administrative control of Cabinet Division for promotion and management of IPRs in the country. Trade Marks Registry, Copyright Office and Patent & Design Office became part of the new organization under a unified and integrated management system (IPO Pakistan 2022). The administrative control of the Organization was transferred from Cabinet Division to the Commerce Division on July

25, 2016 (IPO Pakistan 2022). IPO-Pakistan's head office was established at Islamabad while aforesaid field offices / registries were located in Karachi. IPO-Pakistan also established its regional offices at Lahore and Peshawar for facilitation of the public. The main objectives of the organization are integrating and upgrading the IP infrastructure for improved service delivery, increasing public awareness and enhanced enforcement coordination and to put Pakistan on the intellectual property map of the world as a compliant and responsible country. (IPO Pakistan 2022)

Prior to the establishment of Pakistan, three different offices and registries were working under different Federal Ministries. Trademark Registry was working under the Ministry of Commerce and Copyright Office was under Ministry of Education. Whereas Patent Registry and Office of Design was working under the administrative control of Ministry of Industries. The main function of theses organization was confined to registration of IPRs. However, with the changing global IP environment and emerging of new technologies it was necessary to have an integrated organization which can not only register IPRs for giving them protection but also promote IP culture in the country and encourage the innovators and creators to innovate and to create for the economic development of Pakistan. Hence IPO Pakistan was established with this mandate. Today most of the countries have such type of organizations. Currently, IPO Pakistan is providing registration services for Trademarks, Copyrights, Patent and Design. Recently, it has also started registration of another type of IP that is Geographic Indications (GI)[1]. Till date three GI have been registered by IPO Pakistan. It includes



[1] "A geographical indication (GI) is a sign used on products that have a specific geographical origin and possess qualities or a reputation that are due to that origin. In order to function as a GI, a sign must identify a product as originating in a given place. In addition, the qualities, characteristics or reputation of the product should be essentially due to the place of origin. Since the qualities depend on the geographical place of production, there is a clear link between the product and its original place of production." WIPO, Geneva, 2022.

Basmati rice, Rock pink salt and Hyderabadi bangles. A separate registry is going to be established for GI registration in Islamabad as per the Pakistan Geographical Indications Act 2020. (IPO Pakistan 2020)

### 4.1.1. Main Functions of IPO-Pakistan

Being a federal autonomous entity, IPO Pakistan has been allocated a number of funtions in the IP eco-system of the country. Although there are 28 functions assigned to IPO Pakistan as per IPO Pakistan Act 2012, yet these can be summarized as follow:

1. Administration of IP laws in the country:

IP rights are territorial rights and it is the responsibility of the Government to provide protection to these rights by registering them and by enforcing them. Accordingly, as per IP Laws, the organization is providing facility of registration of IPRs to the right holders in the country. It ensures implementation of IP laws all over Pakistan.

2. Control, manage and supervise working of all IP offices:

IPO Pakistan Head Office is in Islamabad but all the registries and offices which provide registration facilities are situated in Karachi. However, the subregional offices in Lahore and Peshawar have also started basic registration facilities to the right holders under the supervision of the registrars and controller. IPO Pakistan is responsible for managing and supervising of all these IP offices.

3. IP rights enforcement coordination:

IPRs without enforcement can hardly carry any value. IPO Pakistan is responsible for the enforcement of IPRs in the country. It does not have an enforcement agency of its

own, therefore, IPO Pakistan coordinates with all national and provincial law enforcement agencies for effective enforcement of IP Laws. IP Tribunals have also been established in Islamabad, Lahore and Karachi for speedy disposal of IP enforcement related cases.

4. Promotion of IP education, research and awareness:

One of the major functions of IPO Pakistan is to create awareness and to promote IP education in the country. For this purpose, the organization hold seminars, workshops and training programs in the universities, trade bodies and law schools all over the country. Capacity building programs are also being conducted in public sector organizations as well as private institutions. An IP academy has been established in IPO Pakistan (HQs) to carry out this function.

5. Advising the Government on policy formulation relating to IP rights:

It also provides inputs and feedback to the Government through Ministry of Commerce for policy formulation on IP issues. It also assists the Government to present IP related cases on different international fora. It keeps close liaison with the stakeholders to get feedback and to address IP issues through policy formulation.

6. Coordination with counterpart international organizations:

It also coordinates with the international organization like WIPO and IP offices of other countries to promote and to protect IPRs in Pakistan. Accordingly, it has developed cordial relations and network with USPTO, JPO, CNIPA, KIPO and UKIPO. These organizations share best practices in the field of IPRs and support IPO Pakistan in capacity building and training of HR for better management of IPRs.

### 4.1.2. Types of Intellectual Property

There are different types of IPRs such as Trademarks, Patent, Industrial Designs, Geographical Indications, Trade Secrets, Layout Design of Integrated Circuit, Genetic Resource and Traditional Knowledge etc. The main IPRs being administered in Pakistan are explained below:

#### Trademark

"A **Trademark** is a word, phrase, symbol, and/or design that identifies and distinguishes the source of the goods of one party from those of others. A **service mark** is a word, phrase, symbol, and / or design that identifies and distinguishes the source of a service rather than goods". (IPO Pakistan 2022) It is one of the most important IP being used in businesses. WIPO is facilitating registration of Trademark in different countries under the Madrid System. Pakistan is also member of this system. However, in Pakistan registration of Trademark is managed by Trademark Registry established in Karachi. Registry received more than 50,000 applications of Trademark.

#### Patent

"A **patent** is grant of exclusive rights for an invention to make, use and sell the invention for a limited period of 20 years. The patent grant excludes others from making, using, or selling the invention. Patent protection does not start until the actual grant of a patent". (IPO Pakistan 2022) This right protect and promote invention and innovation in a society. WIPO is facilitating in the registration and grant of this exclusive right in different countries under Patent Cooperation Treaty (PCT). At national level Patent Office established in Karachi is responsible for the registration and grant of Patent in Pakistan. Unfortunately, Patent filling in Pakistan remained

below 1000 applications per annum resulting low pace growth of knowledge economy in the country.

## Copyright

"Copyright is a legal instrument that provides the creator of a work of art or literature, or a work that conveys information or ideas, the right to control how the work is used. The intent of copyright is to advance the progress of knowledge by giving an author of a work an economic incentive to create new works". (IPO Pakistan 2022)

**Copyright includes the following creative works:**

- **Literary works** which includes Books, Magazines, Journals, Lectures, Dramas, Novels, Computer programmes/Software and compilation of data etc.
- **Artistic works** like paintings, Maps, photographs, drawings, Charts, Calligraphies, Sculptures, Architectural Works, Label Designs, Logos, Monograms and other works alike.
- **Cinematographic works** which includes movies, audio-visual works, documentaries etc. and
- **Record works** which include sound recordings, musical works etc.

It is not necessary to register a copyright as the right was established with the creation of a work. However, in case of dispute of a copyright, the registration is a proof of ownership in a court of law. That is why it is always recommended that a copyright should be registered. "The Berne Convention, adopted in 1886, deals with the protection of works and the rights of their authors. It provides creators such as authors, musicians, poets, painters etc. with the means to control how their works are used, by

whom, and on what terms". (WIPO 2022) In Pakistan Copyright Office established in Karachi is providing registration services to the authors of works.

## Industrial Design

"An industrial design is the ornamental or aesthetic aspect of an article. The design may consist of three-dimensional features, such as the shape or surface of an article, or of two-dimensional features, such as patterns, lines or colour. Industrial designs are applied to a wide variety of products of industry and handicraft: from technical and medical instruments to watches, jewellery and other luxury items; from house wares and electrical appliances to vehicles and architectural structures; from textile designs to leisure goods". (IPO Pakistan 2022) An industrial design is primarily of an aesthetic or visual nature, and does not relate to the technical features of an article. The Hague Agreement deals with the protection of industrial design at international level. In Pakistan the Registrar of Design Office established in Karachi provides registration of industrial design.



## **Geographical Indications**

"A Geographical Indications is a sign used in relation to products that have specific geographical origin and possess qualities and reputation essentially due to natural and human factors in place of origin. These may be agricultural, traditional, or industrial products of a specific area". (IPO Pakistan 2022) The Lisbon Agreement provides protection for the Geographical Indications at international level. "The Lisbon System is a practical and cost-effective solution for the International Registration of Appellations of Origin (AOs) and Geographical Indications (GIs), offering protection in 38 Contracting Parties, covering up to 57 countries, through a single registration

procedure and one set of fees". (WIPO 2022) In Pakistan, currently registration of GIs is being done by the Trademark Registry. However, GI Law has been approved by the parliament and IPO Pakistan will be establishing a separate Registry of GI for registration.

GI, in fact, add value to the products in national as well as in international market and GI tag enables the seller to have premium price for his product.

In Pakistan protection to IP available are explained in following table:

**Table 1. Types of Intellectual Property**

| IP Type | Importance | Term of protection |
|---|---|---|
| Patents | Protection of technological inventions – development of R&D | 20 years |
| Copyrights | Protection of Artistic and Literary, Music, film works | Life of author + 50 years |
| Trademarks | Development of genuine businesses | Unlimited (renewal after every 10 years) |
| Geographical Indications | Promotion of premium quality products of a specific area/region | Unlimited (renewal after every10 years) |
| Industrial Designs | Protection of new designs of industrial products | 10 years (02 renewals for 10 years each) Total 30 years |

Source: Developed by Researcher



## 4.1.3. Legal Framework

After independence Pakistan adopted the British legal framework to provide protection to IPRs. Trademark Registry was working under the Trade mark law of 1948, Patent

and Design office was operating under Patent law of 1911. The copyright law was passed by the Parliament in 1962 to provide protection to copyrights. Separate rules were also framed under this law to carry out day to day functions. Later on, these laws and rules were undated under the WTO and TRIPS requirement.

Following is the current legal framework in which IPO Pakistan is operating.

1. The IPO Pakistan Act, 2012
2. Patent Ordinance 2000 (Amended In 2002 & 2006)
3. Trade Marks Ordinance 2001
4. Copyright Ordinance. 1962, (Amended In 2000)
5. The Registered Designs Ordinance, 2000
6. The Registered Layout-designs of Integrated Circuits Ordinance, 2000

Accordingly, rules on the basis of above-mentioned legal instruments were also updated and got approved from the Federal Government to register and to provide protections to different types of IPRs besides promoting IP culture in Pakistan.



### 4.1.4. Administrative Setup

IPO Pakistan is working under the administrative control of Ministry of Commerce since 2016. A 14 member Policy Board look after the affairs of the organization and provide guidelines and policy directions to the organization. Chairman of IPO Pakistan is also Chairman of the Board. The public sector members of the Board include Secretary Cabinet Division, Secretary Commerce Division, Secretary Interior, Secretary Information and Chairman FBR. Four representatives nominated by each province also include in the Board. Private sector has also been given representation on the board. Five members out of 14 members are from the private sector. Federal

Government appoint the members of the board for three years. Chairman is also appointed by the Federal Government for three years. The Board look after the functioning of the organization in the country. It has not only the financial authority but also takes all policy related decision of the organization. The Board is required to meet twice a year as per law.

The functional head of the organization is Director General. He looks after the day-to-day functions of all offices of IPO Pakistan. "Total human resource of the organization is 290. However, presently, it is working with less than 50 percent of its original strength". (IPO Pakistan 2022). Fee collected as part of registration of IPRs is a major source of revenue for the organization. Different fee being charged for different services are elaborated in the following table:



**Table 2. Sources of Revenue**

| IPR | Previous Application Free | Current Application Fee Since March, 2019 |
|---|---|---|
| **Patent** | 4500 | 6,750 |
| **Trademark** | 2000 | 3,000 |
| **Copyright** | 1000 | 2,000(Literary Work)<br>2,000 (Each song)<br>6,000 (Label Design)<br>10,000 (Cinematography) |
| **Industrial Design** | 450 | 450 |
| **Geographical Indication**<br>**(For Authorized user)** | **-** | 1,000 |

Source: Fieldwork

### 4.1.5. IP Applications

There is an increasing trend in the IP applications and in the grant of IPRs. It shows that IP culture is growing in the country. In 2005 IPO total number of IP application received by IPO Pakistan was around 15,000. “In 2020 total number of IP applications received were 45,832 whereas in 2022 total 54,912 IP applications were received”. (IPO Pakistan 2022). A number of factors contributed to this positive trend. IP awareness drive, institutional upgradation improved IP enforcement, updating of IP laws and rules, institutional networking and above all provision of online services are a few worth mentioning.

### 4.1.6. IPR Enforcement

IPR enforcement is very important component of an IP system. Without enforcement on the one hand the IP right holder will not be able to earn economic benefits, on the other hand it will promote copy culture in a society. Resultantly, not only the consumer will suffer but also creativity and innovation will be discouraged. Therefore, an efficient and effective IPR enforcement mechanism is very essential for promotion of economic development. IPO Pakistan does not have its separate enforcement agency like custom department. Rather it has established coordination committees in different business centers of country. In fact, Law Enforcement Agencies (LEAs) have been mandated for the enforcement of IPRs all over Pakistan. For copyrights enforcement Federal Investigation Agency (FIA) is mandated. A separate wing has been established in FIA to handle all the piracy cases. Police department can also take action for immediate relief. Enforcement of Trademarks is dealt by Police department. For border measures, Custom Department has setup a separate Directorate General. The infringement of IPRs during import and export are dealt by this Directorate under the IPRs Custom

Amendment Rules, 1917. Cases of signal piracy are dealt by Pakistan Electronic Media Authority (PEMRA).

### 4.1.7. IPR enforcement Coordination Committees

IPO Pakistan has established IPR enforcement Coordination Committees in ten cities i.e., Peshawar, Quetta, Gilgit, Multan, Faisalabad, Sialkot, Sukkur, Islamabad, Karachi, Lahore for effective and efficient enforcement. These Committees are comprised of IPO, FIA, Police, Pakistan Customs, PEMRA, Provincial Food and Health Departments, Chambers of Commerce, and Industry. Regular meetings are held to solve the enforcement related issues and to get feedback from the stakeholder. IPO Pakistan also arranges training courses for the all the LEAs on regular basis. It has also published guidelines for the LEAs to handle IPR violation cases including infringement and piracy cases. These guidelines are also available online at its website. In addition, IPO Pakistan has established Complaint Cell in all its offices to guide the right holders for the protection of their rights. Any incident of piracy or infringement can also be reported to the concerned LEAs through these Cells.



### 4.1.8. Establishment of IP Tribunals

For speedy trial of infringement and piracy cases, the Government of Pakistan has established three IP Tribunals in Karachi, Islamabad, Lahore. These are trial courts and appeal against their decision can only be filed in concerned High Courts. IPO Pakistan has nominated focal persons to provide the technical assistance to the IP Tribunals. However, there is a dire need to establish further IP tribunals keeping in view the rising cases of IP infringements and piracy in the country. IPO Pakistan is working with the Law Division for the establishment of more IP Tribunals.

### 4.1.9. Institutional Linkages:

To bring improvement in IP System and for better coordination, IPO Pakistan established linkages with the concerned international and national organization. Service Level Agreement (SLA) was signed with WIPO in March 2022. MoU was inked with Turkish Patent Institute and with China National Intellectual Property Office (CNIP). With the cooperation of WIPO and HEC, it has established 47 Technology Innovation Support Centers (TISCs) all over the country. It has provided a vast network especially with the academia and industry. In addition, it has also signed MoU with HEC, PITB, FBR, SECP, CCP, PARC, PCSIR, and PEC. This network is providing platform for the promotion and protection of IPRs in Pakistan.

## 4.2. The Patent Office

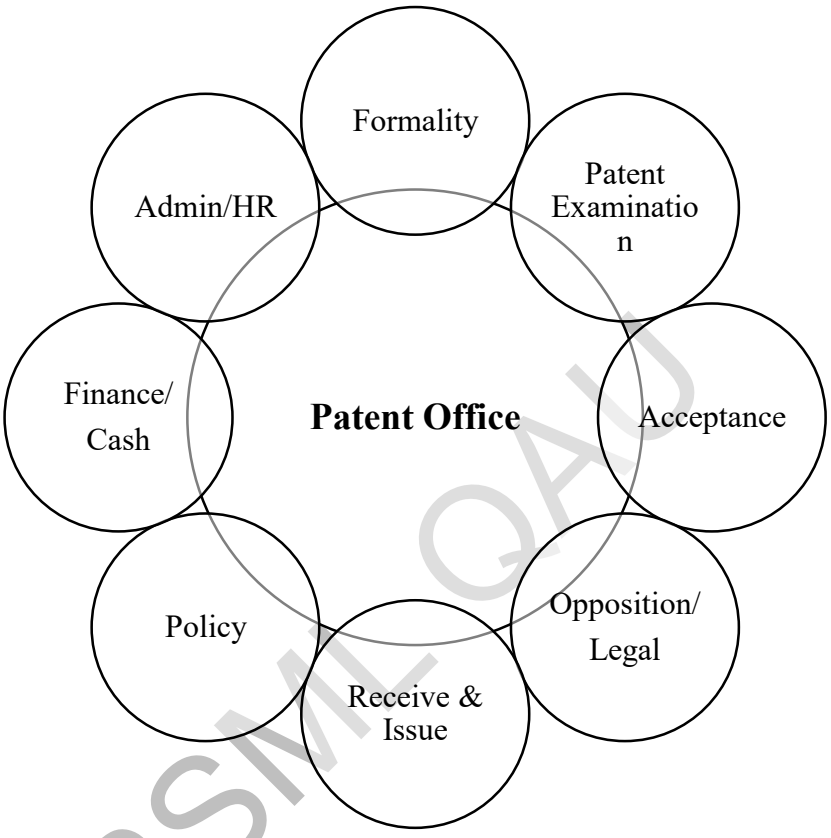
The Patent Office supports economic growth, competitiveness, and innovation throughout Pakistan. Such occurrences have been avoided by the patent system. The patent system was created to encourage technological advancement, industrial growth, and the use of technological resources in the development of new ideas. Therefore, the role of a Patent Office in the growth of knowledge economy is vital.

### 4.2.1. Patent Office's services

Patent Office provides the registration services for a patent. The examination and grant of patent is responsibility of this office. The search and assessment of patent applications as well as the grant of patents are the Office's primary tasks. Additionally, the patent office offers training and informational services. The renewal of a patent is also done by this office. It is also the depository of granted patent of a country.

Facilitation and capacity building is also undertaken by this office. The main tasks of Patent Office are explained below

**Figure 1. Patent Office Sections**




Source: Developed by Researcher



## 4.2.2. Formality Patent Office

In the patent office have separate section for the formality examination in which the formal requirement of the patent application has been assessed. Only formal requirements of the application for patent are checked. Patentability of the product or process is dealt by the examination section.

### 4.2.3. Patent Examination

In this section Patent Examiners perform technical search and examination of patent application. Examiners issued examination report to the applicant which comprises substantives issues related to the novelty and the inventiveness of the patent invention.

### 4.2.4. Acceptance section

Acceptance section issued the letter of patent document when the patent invent has been accepted by the controller.

### 4.2.5. Opposition/legal

Opposition section deal with the opposition filed for a patent invention after its publication during the four months. It processes all types of opposition cases and assist the Controller to decide these opposition cases.

### 4.2.6. Receive & Issue

R&I section received and issued all the documents related to the Patent Application. All correspondence sends and receives by this section.

### 4.2.7. Policy Section

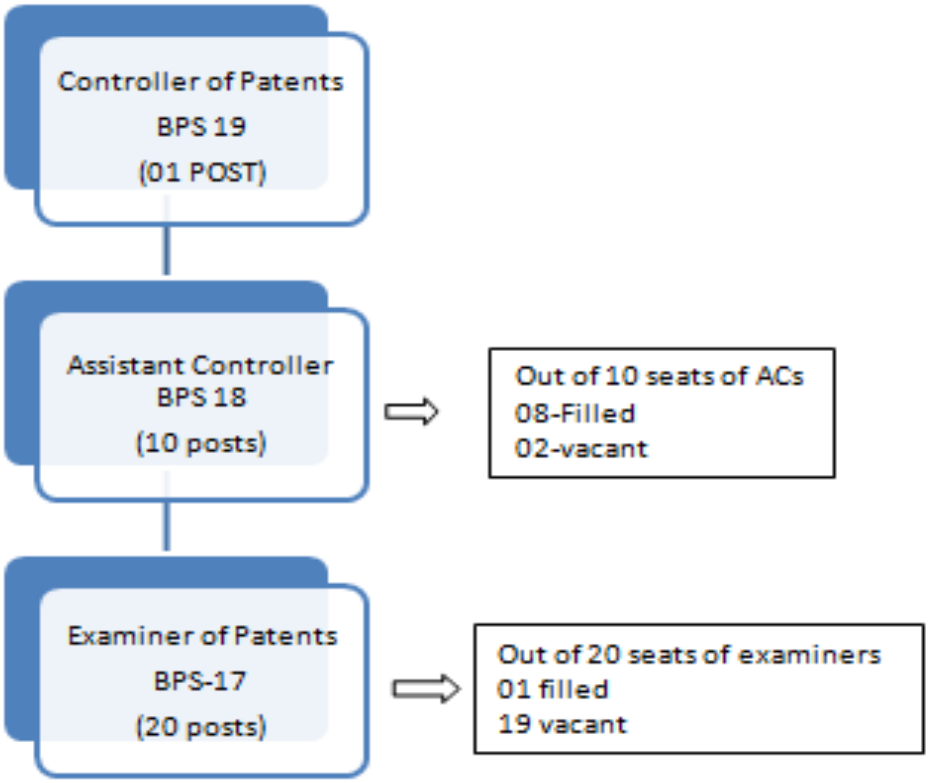
All the documents formulated and amended after the examination under the policy section. Policy section also maintain the record of it.

### 4.2.7. Management Section

This section deals with the day-to-day management of Patent Office. Its basic task is to facilitates the examiners as well as other staff of the office to carry out day to day functions of the office.

### 4.2.8. Organization Body of the Patent office:

Figure 2. Administrative Body of IP Patent Office

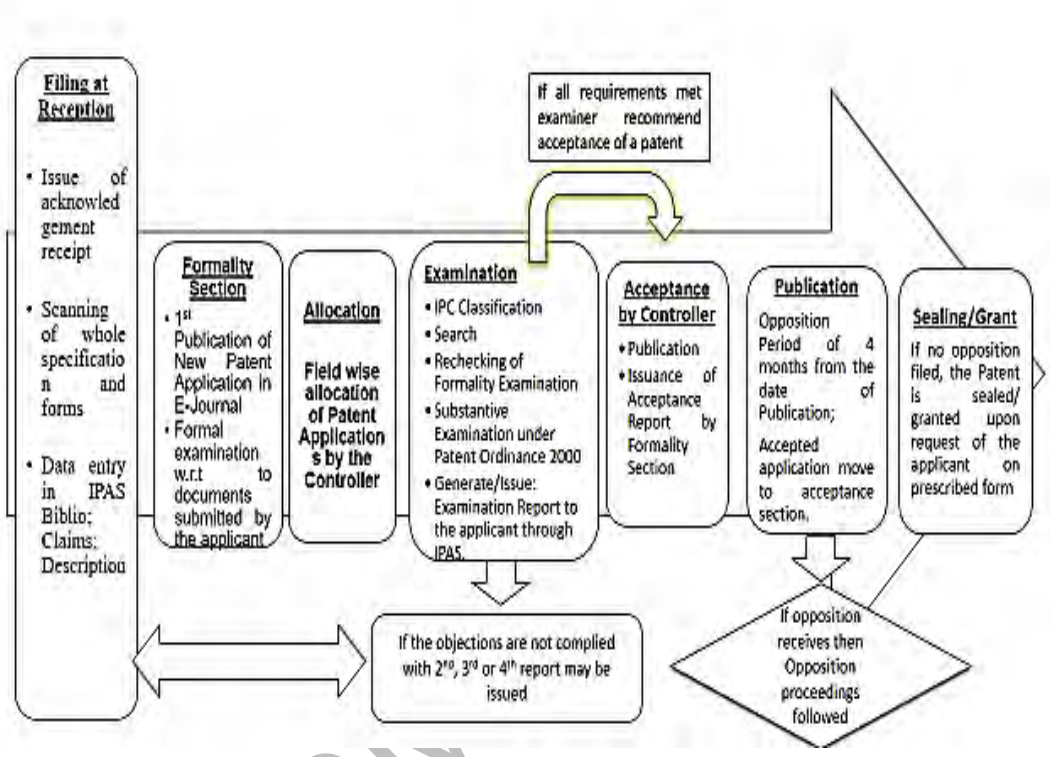



Source: Field work

The Patent Office is headed by a Controller of Patent Office and assisted by Assistant Controller. However, most important position in the office is of Patent examiners. Their recommendations play vital role in the grant of a patent. They are well qualified and expert in their respective fields. They conduct all required patent research and guide the applicant as well as Controller.

## 4.2.9 Flow of Patent Application till Grant

Figure 3. Patent Application Process




## 4.2.10. Future Challenges for Patent Office:

The process of granting patent is very slow and out dated. It takes more than three years to get a patent. There is no digitization and online filling option. Pakistan has not joined PCT yet. It is hard for a Pakistani patentee to apply for patent in other countries for the protection of their rights. Legislation is outdated resulting delays in processes. Under secretariat instructions, weeding out of Expired Patents (>25000) which need to be sent to National Archives after digitization. All sections including examination section is suffering due to lack of human resource.

## 4.2.11. Patent Cooperation Treaty

If we look at the world's PCT map all the progressive nations have joined PCT. There are **156** member states of PCT as of July 2022. (WIPO 2022)

**Figure 4. Patent Corporation Treaty (PCT) MAP**

Source: WIPO. 2022

The Patent Cooperation Treaty (PCT) is an international filling system of Patents. It is an agreement among those members of WIPO that have acceded to this treaty to entertain and to recognize the Patent applications of each other. IT is easy to use and cost effective. If an inventor or innovator want to file his patent in more than one country, he can file it by using this system. He does not need to go in different countries. It is managed by WIPO. Pakistan is not a member of this treaty yet. However, on demand of stakeholders, IPO Pakistan has completed his homework for the accession of this Treaty. After the approval from the Parliament, Pakistan would be able to file application of accession with WIPO. It will facilitate men and women innovators to file their patents abroad in different countries with a single application.

## 4.3. World Intellectual Property Organization

The WIPO serves as a global forum for information, cooperation, and services related to intellectual property (IP). It is a self-supporting United Nations organization with 193 member states. (WIPO 2022)

Its goal is to take the lead in creating a fair and functional international IP system that encourages invention and creativity for the good of everybody. The WIPO Convention, which created WIPO in 1967, outlines its mandate, regulatory bodies, and procedures. (WIPO 2022)

### 4.3.1. IP services

WIPO offers IP services that inspire individuals and companies to develop and produce new things. A one-stop shop for all international IP services is the WIPO IP Portal. (WIPO 2022)

### 4.3.2. IP Member states

In the yearly meetings of the Assemblies, WIPO 193 member states endorse WIPO's strategic direction and actions. (WIPO 2022)

### 4.3.3. WIPO Resources

Publications of WIPO is a great source of information. Its website is very rich in resources and one can find any information and guidance on any type of IP. It is full of data and other research articles and books. Moreover, it is a very interactive website.

### 4.3.4. WIPO Policy

WIPO brings together stakeholders to create international IP agreements. It provides opportunities to join different standing committees and conferences to follow public debates and negotiations regarding the future development of IP. (WIPO 2022)

### 4.3.5. WIPO Cooperation

It extends help to different countries, companies and individuals for use of IP system. It also offers trainings besides arranging seminars and workshops for them.

In fact, WIPO provides different types of IP related services to its member states for a smooth, equitable and predictable global IP system. It coordinates with all member states for their capacity building, information sharing and implementation of IP best practices. It encourages IP protection and promotes innovation culture globally. It also facilitates in the registration of some IPs in different countries. Its publications and data maintenance are very useful for the research and development.

Being an UN agency, WIPO is very effective in the promotion of IPR culture all over the world. It is regularly conducting seminars, workshops, webinars, training courses in all parts of the globe. It has formulated different assemblies in Geneva to address different IP issues. It coordinates with its member states to settle these issues. It arranges meetings of the assemblies on regular basis in which concerns of member states are being discussed. Therefore, it is also a forum for the global as well as national IP policy formulation.

# CHAPTER NO. 5

# WOMEN INNOVATORS AND PATENT REGISTRATION IN PAKISTAN

Data on Intellectual Property Registration for local filings has been accessed from 2005, the year since the IP Office Pakistan started maintaining digitized data on IPR, till end December 2021. According to the data, a total of 4,788 applications for Patent was filed during the period 2005 and 2021. Out of the total, the ratio between men and women applicants were 2.5:1, while the ratio between men applications granted and women applications granted was 2:1. See table 3 below for details on comparison for total applications, granted, pending, and abandoned.

**Table 3. Gender Wise Status of Patents – 2005-2021**

| | Total | Men | Women | Ratio men Vs Women |
|---|---|---|---|---|
| Applications | 4,788 | 3605 | 1,183 | 2.5:1 |
| Granted | 1510 | 580 | 290 | 2:1 |
| Pending | 75200 | 2,787 | 843 | 2.3:1 |
| Abandoned / withdrawn | 288 | 238 | 50 | 4.7:1 |

Source: Field work

The above table explains the situation in Pakistan on the patent filling in general as well as gender wise. It was ironical that despite all achievements in educational and research fields, the patent filling in Pakistan remained very low. There is also a need to investigate that although women in Pakistan have achieved a number of mile stones in all fields including education and research and they are ahead men in some fields yet they hardly file patent applications to get protection of their hard work.

**Table 4. Year-wise data on applications filed, opposed, pending, and abandoned, against total as well as for women**

| Year | Total Local Applications | Women Applications | Year | Total Applications | Women Applications | Year | Total Applications Granted | Women Applications | Year | Total Applications Pending | Women Applications Pending | Year | Total Applications Abandoned | Women Applications Abandoned |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2005 | 128 | 1 | 2005 | 0 | 0 | 2005 | 16 | 0 | 2005 | 107 | 1 | 2005 | 5 | 0 |
| 2006 | 74 | 3 | 2006 | 0 | 0 | 2006 | 7 | 0 | 2006 | 58 | 1 | 2006 | 9 | 0 |
| 2007 | 101 | 3 | 2007 | 0 | 0 | 2007 | 16 | 1 | 2007 | 74 | 1 | 2007 | 11 | 0 |
| 2008 | 155 | 52 | 2008 | 0 | 0 | 2008 | 26 | 16 | 2008 | 102 | 28 | 2008 | 27 | 0 |
| 2009 | 99 | 26 | 2009 | 0 | 0 | 2009 | 20 | 7 | 2009 | 72 | 17 | 2009 | 7 | 0 |
| 2010 | 105 | 19 | 2010 | 0 | 0 | 2010 | 11 | 2 | 2010 | 82 | 9 | 2010 | 12 | 0 |
| 2011 | 87 | 32 | 2011 | 1 | 0 | 2011 | 21 | 9 | 2011 | 59 | 19 | 2011 | 6 | 0 |
| 2012 | 92 | 27 | 2012 | 0 | 0 | 2012 | 14 | 6 | 2012 | 68 | 16 | 2012 | 10 | 4 |
| 2013 | 145 | 47 | 2013 | 0 | 0 | 2013 | 16 | 6 | 2013 | 112 | 33 | 2013 | 17 | 3 |
| 2014 | 144 | 44 | 2014 | 1 | 0 | 2014 | 8 | 5 | 2014 | 114 | 34 | 2014 | 21 | 4 |
| 2015 | 199 | 91 | 2015 | 0 | 0 | 2015 | 7 | 2 | 2015 | 134 | 63 | 2015 | 58 | 20 |
| 2016 | 204 | 71 | 2016 | 06 | 0 | 2016 | 214 | 1 | 2016 | 12,273 | 61 | 2016 | 45 | 7 |
| 2017 | 193 | 65 | 2017 | 14 | 0 | 2017 | 168 | 1 | 2017 | 12,673 | 57 | 2017 | 43 | 4 |
| 2018 | 307 | 91 | 2018 | 07 | 0 | 2018 | 263 | 0 | 2018 | 12,079 | 83 | 2018 | 17 | 8 |
| 2019 | 309 | | 2019 | 0 | | 2019 | 270 | | 2019 | 12,019 | | 2019 | 874 | 121 |
| 2020 | 338 | | 2020 | 07 | | 2020 | 199 | | 2020 | 12533 | | 2020 | 900 | 117 |
| 2021 | 422 | | 2021 | 05 | | 2021 | 234 | | 2021 | 12641 | | 2021 | 993 | 183 |
| Total | 3102 | 572 | Total | 43 | 0 | Total | 1510 | 56 | Total | 75200 | 423 | Total | 288 | 50 |

Source: Field work

## 5.1. Applications filed

There doesn't seem to be any consistent growth pattern in women filing for IPR, from 2005 to 2021. There has however been a significant increase from 2005 to 2021; the lowest was in 2005 when only one application from woman was filed, and the highest was in 2018 when 91 applications were filed. Same number of applications had also been filed by women in the year 2015.

## 5.2. Applications opposed

Once the applications are filed, after preliminary examination, the applications are either accepted or sent back to the filers for rectification of observations raised by IPO. If the applications are accepted, the details of the applications are then published by the Intellectual Property Organization Pakistan on their website, for information of public and for opposition, in case anyone has any objection to it. Over a period of 17 years, with 4,788 total applications filed, there were only 2 applications, both submitted, by men, which were opposed, while there were no applications opposed on applications filed by women.



## 5.3. Patents Awarded

Total patents granted for women shows a peak in 2008 but since then showed a gradual decrease. Out of a total of 4,788 applications filed between 2005 and 2021, only 169 applications merited grant of patents. Of these 169 patents, women secured 56 patents. See table 5. for details on patents by each year 2005-2021.

**Table 5.Total applications granted Vs women applications granted 2005-2021**

| Table 5. Total applications granted Vs women applications granted 2005-2021 | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | Total |
| Total Granted | 16 | 7 | 16 | 26 | 20 | 11 | 21 | 14 | 16 | 8 | 7 | 214 | 168 | 263 | 270 | 199 | 234 | 1414 |
| Women Applications Granted | 0 | 0 | 1 | 16 | 7 | 2 | 9 | 6 | 6 | 5 | 2 | 1 | 1 | 0 | 2 | 3 | 2 | 56 |
| Percentage | 0 | 0 | 6.3 | 61.5 | 35.0 | 18.2 | 42.9 | 42.9 | 37.5 | 62.5 | 28.6 | 20.0 | 50.0 | 0.0 | 1.53 | 1.5 | 0.85 | 33.1 |

Source: Field work

## 5.4. Pendency of applications

Pendency relates to applications not pursued after submission. Reasons for pending applications include pending with IPO due to human resource constraints, as well as on the part of applicant for removal of gaps in the applications. The reasons for gaps in the applications are lack of skills required to file a claim on the part of women inventors. As most applications are submitted through attorney and who receives entire fee upfront and doesn't have any interest or incentive in responding to IPO queries. On the other hand, IPO is constraints to contact with the applicant directly due to non-availability of applicant's contact numbers/emails

**Table 6. Total applications pending vs women applications pending**

**2005-2021**

| Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Applications Pending | 107 | 58 | 74 | 102 | 72 | 82 | 59 | 68 | 112 | 114 | 134 | 1640 | 1902 | 1942 | 1619 | 1644 | 1434 | 1562 |
| Women Applications Pending | 1 | 3 | 2 | 36 | 19 | 17 | 23 | 17 | 38 | 35 | 69 | 63 | 60 | 83 | 71 | 85 | 69 | 288 |
| Percentage of Women Applications Pending | 0.9 | 5.1 | 2.7 | 35.2 | 26.4 | 20.7 | 38.9 | 25.0 | 33.9 | 30.7 | 51.4 | 42.0 | 41.3 | 29.1 | 4.1 | 5.1 | 4.8 | 18.4 |
| Total applications filed by women | 1 | 3 | 3 | 52 | 26 | 19 | 32 | 27 | 47 | 44 | **91** | 71 | 65 | **91** | 121 | 117 | 183 | 572 |
| Percentage of Women Applications Pending | 100% | 100% | 66% | 69% | 73% | 89% | 71% | 63% | 80% | 79% | 75% | 88% | 92% | 91% | 39% | 34% | 43% | 50% |

Source: Field work

## 5.5. Abandonment of applications

Out of 4,788 total applications, 288 were abandoned by the applicants. Reasons of abandonment include loss of interest in getting the inventions patented. Interestingly 95% applications filed by women were from academia, whose main interest was to get 2 credits counted towards their promotions. Other reasons include loss of interest due to uncertainty of time taken for approval of their application; loss of interest is also manifested when the party does not come forward in response to invitation for hearing. Another reason for loss of intertest is that there is no more demand for the item, for which the party had applied for registration; Mind-set of the society at large is also one of the reasons for abandoning the applications; people are not very particular about use of pirated copies; it is not considered a crime in this society. Since people unflinchingly use pirated copies, the authors tend to consider securing registration as futile effort. Most authors go for registration only if they foresee some litigation; people do not have awareness about the benefits of copyright; they also lose interest if the business suffers a loss. See table 7. blew for information on abandonment of applications

**Table 7. Applications abandoned by year by women against total abandonment – 2005-2021**



| Table 7. Applications abandoned by year by women against total abandonment – 2005-2021 | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | Total |
| Total Abandoned | 5 | 9 | 11 | 27 | 7 | 12 | 6 | 10 | 17 | 21 | 58 | 45 | 43 | 17 | 02 | 10 | 0 | 300 |
| Women | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 4 | 20 | 7 | 4 | 8 | 0 | 3 | 0 | 50 |

Source: Field work

## 5.6. Commercialization

Information on commercialization, was difficult to obtain, as the IPO Pakistan does not maintain such information. The matter was complicated further by the fact that the applications for IPR do not have any provision for either email, or cell number of the applicants; all they have, by default, is the postal address used by IPO for official communication. Efforts were made to contact them by tracing their contact numbers through the website of the applicant companies. The effort did not produce much result; emails went un-responded, telephonic contact went into an infinitive loop. Some information on the status of commercialization was however obtained during case studies, mentioned under each case study.

Previously, HEC was providing an incentive to the researcher. It gave credit equal to publication of two papers in a recognized journal, is a researcher file a patent application. It was observed that most of the researchers filed patent applications but hardly follow up in getting grant of the applications. They did not know the benefit of commercialization of their research work.

In addition to above, our R&D institutions have very weak linkages with the industry. Resultantly, our researchers have very little knowledge about the demand of the industry and incentives of commercialization. However, some university like NUST has started to work with the industry and some of their researchers were able to commercialize their research work. There is a need to create awareness among the innovators to encourage them for commercialization of their innovations. All the research institutes and academia must build linkages with the industry to boost commercialization of innovations and inventions. ORICs of a few universities are active in this regard. But most of them are dormant.

# CHAPTER NO. 6

# PROBLEMS FACED BY WOMEN INNOVATORS

Field work has revealed five major issues and challenges being faced by women innovators in Pakistan. These include, first, high cost of patenting an innovation or invention, second, time taken by the Patent Office in grant of a patent, third, social set up of society hinders women to commercialize their innovations or inventions, fourth, institutional set up in Pakistan seldom provide enabling environment to women and lastly, the technical and cumbersome filing process of a patent. In most of the cases, the women innovators or inventors have to hire lawyers to get grant of a patent and at the same time they seldom have some platform to connect with the industry for commercialization of their inventions.

## 6.1. Cost Issue

### 6.1.1. Manipulation by lawyers

Field finds reveal that this relates to lack of skills for patent filing, as it is considered a specialized job which is not available with the researchers, especially the individual inventors. Since the inventors do not have the required legal skills, they are forced to solicit services of the lawyers and thus become subject to manipulation by them.

### 6.1.2. High cost of attorneys

Majority of the respondents informed that due to lack of knowledge of inventors for filing a patent, the researchers resort to solicitation of the services of legal attorneys, who charge a high cost, considered unaffordable by the individual researchers. The cost ranges between 35,000 PKR to 100,000 PKR depending on the nature of the invention.

### 6.1.3. Registration and Renewal fee

Field findings indicate that this is another cost that the respondents reported as an obstacle in filing for patenting. However, on probing and confirming from IPO staff as well as from their web site, it was found that the fee for applying for patent is 6,750 PKR only that is around 40 USD which is, by any standard not prohibitive. However, there are fees for subsequent requests like additional claims, additional pages of specifications, extension of time, notice for opposition, and notice for hearing of oppositions. See Annex B for cost of patenting:

## 6.2. Time Issue

### 6.2.1. Time between application and award of patent

Several respondents pointed out that the time between application and award of patent takes anything between 24 to 36 months and is considered discouraging by the inventors. The reason for delayed processing seems to be inadequate staff to application ratio. As per record of IPO, a total of an average of 1000 applications is received every year that need to be examined. This includes local as well as foreign applications. Out of these 1000 applications 15% are granted while 79% (more than 800 applications) remain pending every year for want of documentation from the applicants and are to be examined for corrections and amendments based on observations of IP offices. The process steps are also time consuming. The applications are screened for their completion, scanned by IT section, classified according to the nature of application / patent, and then examined against the criteria of patenting, followed by inviting of oppositions. Once successful at all stages, the product is patented. In case of oppositions, there is another lengthy stage of hearing and resolution of oppositions before patent is finalized. Analysis of data supported these statements; Twenty-three per cent (23.2%) cases that were awarded within a one-year period; 14.3% cases

involved between one and two years, - more inclined towards two years, while cases that required between two and three years were 25%, approximately 18% cases were disposed of in between three and four years, and 19.6% involved more than four years. This data pertains to women patents only. See Annex C for detailed time involved in patenting, - women only - by each year from 2005 to 2018.

Another discouraging factor, as stated by some respondents, is time demanded by research; women researchers have multifarious tasks at home as well like home management, cooking, looking after their children, that doesn't allow them to stay late for continuous research activities, consequently their home activities tend to get more priority than research. Since no research therefore no patent, was the response of women.

### 6.2.2. Filing for patent

There is a general belief among researchers that within the time required for filing, - 2 to 3 years -, they are able to generate a couple of publications on their research that fetches more monitory value than offered by patents, and hence filing for patents get a low priority.

## 6.3. Social Problems

Field findings pointed out that among the social factors inhibiting registration for IP, majority were related to research itself: research requires late sitting that then adversely affects the family life of women, especially if they are married and have children and thus discourages women in going for research. Restrictions by families on female mobility is another reason cited for discouraging women inventors in getting involved in the process of IP registration; unmarried females are not allowed to go out of their homes without a chaperone, be it their father or brother. If the father or brothers do not

have time for the women, then the females have no option but to forgo their desire for IP registration. At any given time, there are more male applicants in IP Offices as compared to women, and females do not feel comfortable to navigate through the crowd of men and being stared at.

## 6.4. Enabling environment

### 6.4.1. Lack of awareness.

It was consensus among the respondents that a few people know about IP. They don't know the benefits of IP registration; they do not know the process of registration. They do not know that it is their right to safeguard their invention. Lack of awareness is thus one of the major reasons for discouraging women is resorting to IP registration. This is more applicable when the inventor is an individual.

### 6.4.2. No incentive for researchers

A number of respondents stated that publications have more value than having a patent and is thus a discouraging factor in going for IP registration. The policies of HEC have a great influence on the culture of innovation and patenting. Till early 2018, HEC had encouraged patenting by equating with publications that in turn facilitated in early promotions and thus monitory benefits. According to HEC notification, one International (Technology related) Patent awarded from technologically advanced countries were equated to a maximum of 2 Impact Factor (IF) publications, and if there were evidence of commercialization, then up to 5 publications in IF journals. Similarly, one Local / National Patent awarded by the relevant body was equated to maximum of 2 IF publications, and if it led to actual commercialization then up to 5 publications in IF Journals. However, of late - last quarter of 2018 - HEC has canceled this equivalency thus discouraging inventors for patenting.

**Absence of IP policy in academia.** Data indicates that most of the universities do not have an IP policy to boost the interests of the researchers. This is another obstacle that hinders innovation, and consequently IP registration.

### 6.4.3. Publications before patenting

As a standard rule, if research is published by the researcher himself or herself, before the award of patent, the research disqualifies itself from patenting. In developed countries there is a grace period of 12 months; a researcher is offered a window of 12 months from the publication of his or her research and application for patenting. This facility is not yet offered in Pakistan, although amendment in relevant laws is being considered in the interest of research.

### 6.4.4. Lack of motivation

Data shows that since there is no monitory benefit, the women inventors are not motivated for research, - other than obtaining a PhD -, and thus do not pursue for IP Registration. The withdrawal of the facility of equivalency of patenting with publications has further dampened the motivation of inventors. Motivation for IP registration is also adversely affected by the fact that there is no effective enforcement of IP Laws. The only course of action is to go to courts, and the courts take a discouragingly long time for decision.

### 6.4.5. Lack of innovation culture

Field work reveal that overall, there is no culture for original thinking or appreciation of innovation. Piracy is accepted norm, and thus people in general and women, are resigned to the fact that their product, even if patented, will be copied and that nothing can be done about it. This is further aggravated by the fact that courts do not have the reputation of dispensing quick justice, besides the fact that the process is time

consuming as well as costly. All these tend to discourage women, in venturing into IP registration.

Lack of innovative culture is also fostered by assigning administrative jobs to the researchers. These administrative jobs take up a lot of the time of the researchers, leaving no room for innovative research. As a principle, when a researcher is given administrative responsibilities, the system gets a weak administrator and loses a good researcher.

### 6.4.6. Limited access to business incubation centers

The Government of Pakistan established a chain of National Incubation Centers (NICs) under public-private partnership. It aims at providing facilities to nurture start-ups during their early phases. These centers are currently present only in Islamabad, Lahore, Karachi and Peshawar only. There has been a demand for establishing such centers in other major cities and has been cited as one of the reasons for lack of patenting innovations as pointed out by some respondents. In the absence of such incubation centers the link between academic research and industrial demands is weak as indicated by majority of respondents.



## 6.5 Technical Issues

Brief description of technical factors that discourage innovators in filing for patent are mentioned below:

### 6.5.1. Lack of capacity for filing

Field work indicates that the researchers are good in research, but they do not have the legal knowledge and skills to file for patents. For these reasons, if they can afford, they hire the services of attorneys, and if they cannot afford, they forget the idea of going for patenting. Although a chain of support organizations by the name of Organization

for Research, Innovation, and Commercialization has been established by HEC, but the staff within these organizations too lack the required legal skills, for filing for patents. There is thus no direct guidance for the researchers where the researcher just provides the research, and the support organization completes the entire package and files the application for patent.

### 6.5.2. Non availability of business counselling / mentoring

Data indicates that there exist two different organization, one by the name of National Incubation Centers (NICs) that is working under the ministry of Information Technology, having its offices in four provincial capital cities as well as the national capital Islamabad. The second is by the name of Business Incubation Centers (BICs), housed at ORICs, with the same mandate, and has a wide coverage with its offices at almost all major universities. The NIC is a new phenomenon, having been established very recently, while the BIC has been working for quite a while. Both these organization have a mandate for mentoring, and linking research to business, but they are yet to make their mark. One of the main reasons is lack of capacity of these organizations.



### 6.5.3. Researching data

Data shows that before filing for patenting, one needs to make sure that the research in question has not been published or registered earlier, both nationally and internationally, for which the researchers need to carry out data search. This facility is provided at all IP offices but are available on cost, and the researchers must visit the office premises to access the information. Second source for data search is the Technology and Innovation Support Centers (TISCs) that provides access to international data base on IPRs. These search engines have the reputation of being

cumbersome to negotiate among the novice researchers and is considered an obstacle in filing for patents.

### 6.5.4. Apathy

Majority of the respondents stated that the cumbersome procedure for patenting, lack of awareness, and lack of skills for drafting claims and filing, and the society at large being accepted of intellectual piracy, lengthy process for justice, lack of enforcement of IP laws, all these contribute to a general attitude of apathy among the researchers for securing intellectual property rights, thus contributing to lack of motivation.

## 6.6. Programs designed to support women innovators

### 6.6.1. Offices of Research, Innovation and Commercialization

Currently Offices of Research, Innovation and Commercialization (ORICs) is the only Government sponsored program that is designed to support inventions and innovations, equally for men and women. These centers were established by HEC. Unfortunately, most of the ORICS are not working properly. Apart from a few, the outcome of most of ORICS is negligible. The seldom provide the desired support to the women innovators. Most of them even do not have technical human resource. They seldom have linkages with industry. Therefore, they lack capability to provide technical support to women researchers. Resultantly, the motivation level for commercialization of their research is very low. However, the institute like NUST has some success stories. ORIC of NUST established patent wall in its center, it has become highest filler of patent in Pakistan. It was successful in establishing linkages with the industries and was able to help in commercialization of patents of researchers. It provides conducive environment to women innovators who not only file their Patents for registration but also a few of them were able to commercialize their products. This model needs to be replicated by other universities all over the country.

### 6.6.2. Technology and Innovation Support Centers

The second program for providing support to inventors and innovators is Technology and Innovation Support Centers (TISCs). The HEC of Pakistan supports the establishment of Technology and Innovation Support Centers under the World Intellectual Property Organization (WIPO) TISC program at ORIC in higher education institutes and Government Organizations.

Story of TISCs is not much different from the ORICs. Although it provides access to data basis to the researchers, but it lacks technical human resources. Moreover, universities are less interested in making them vibrant and useful centers. Some training programs are being arranged on annual basis with the help of WIPO and IPO Pakistan. Interestingly, most of the TISCs do not have focal persons. They exist only on paper. So, women innovators cannot take advantage of these centers. In fact, they need hand holding.

Both programs are well thought out and equally well intended, but promoting IP is not one of the core objectives, of either ORIC or TISC. IPO Pakistan, on their own, do carry out awareness workshops in academia and R&D institutions, where the sessions are mostly focused on information about IP, but lack in content for motivation. The question, “why should I register my innovation”, is not adequately addressed. Women innovators cannot have desired support from these centers established by Government of Pakistan. They cannot contribute to the economic development of the country.

# CHAPTER NO. 7

# CASE STUDIES

Case studies of three women inventors who have successfully taken their inventions to the market and who were able to use IP system effectively are worth mentioning. These case studies provide encouragement for commercialization to the women inventors and innovators. They can take economic gains from their inventions by using the existing IP infrastructure of the country. No doubt, case studies are always source of inspirations and encouragements for the researchers. Therefore, these need to be included in the research work.

## 7.1. Case Study 1

After the 2013 elections for National Assembly of Pakistan, the opposition challenged the results. Mr. Imran Khan, Chairman, Pakistan Tehrek-e-Insaf, levelled serious allegations of rigging in the elections. He claimed that rigging have taken place in 35 constituencies of the National Assembly and urged the Election Commission of Pakistan (ECP) to address his party's concerns before announcing results. The verification of voters' thumb impressions would help identify rigging and satisfy those protesting it. It would also discourage such practices in future, he added. As a result of the complaints, the ECP ordered recounting in nine constituencies upon concerns shown by the candidates in their applications. The ECP also decided for random verification of thumb impressions of the voters. In one incidence at NA 256, a total of 201,984 were reportedly casted. Out of these the thumb impressions on 57,642 ballots could not be compared or matched through the Nadra system because the fingerprints were of very poor quality. This result greatly tarnished the results of the elections, and consequently the image of ECP. The causes to the low quality of thumb prints were explored and it was found that the cause lay in defective ink used on ink pads for

affixing fingerprints. PCSIR was asked to develop a standard ink to be used in elections based on the criteria: The ink to dry in five seconds; no excessive ink be applied on thumb; ensure constant flow of ink in application; high quality impression to be obtained; easy extraction of thumbprints; ridges of thumbs be distinctly visible; minimum 12 minutes be available on the thumb prints; pH value to be contained between 3.5-4.1; the ink on pads should not dry for seven days in open air. The previous ink did not meet these criteria and all 88,000 inkpads had to be thrown away.

Next elections of Local Bodies were scheduled to be held on 7 December 2013. The reputation of ECP was at stake. Nadra requested PCSIR on 10 November 2013, to develop an ink meeting all the above criteria to be used in the forthcoming elections. PCSIR had a net 27 days to carry out research, develop the ink with required specifications, get it approved by Nadra, and produce 1250 liters of approved ink for use in the elections by 5th December 2013.

Dr. Shahnaz Perveen, Director, Planning and Development, PCSIR Laboratories Government of Pakistan, along with one of her colleagues Dr. Ghulam Fareed embarked on this challenging mission, of national importance and urgency. She was known for her initiatives to take up challenging tasks.

She analyzed the previous inks, found out the flaws and developed a standard ink using food grade solvent. She tested it positively on all the criteria of Nadra, got it approved on 21 November 2013, and produced and ensured supplies of 1250 liters of ink, well in time to be used in the Local Government Elections. A national catastrophe was thus averted because of the Shahnaz Parveen's courage, knowledge, skills, and persistence.

Application for patenting of the ink was submitted on 5 December 2013, and it was finally patented on 25 May 2017, and has been renewed regularly since then. The ink can now only be produced by PCSIR. The same ink produced by PCSIR was

successfully used in the 2018 election. PCSIR is a Government Department and would like to retain the license for this invention becoming the sole producer of the ink.

This case elaborates that will, determination, hard work and institutional support are key to success. Dr. Shahnaz Perveen was not only able to meet the challenge by developing the desired product but also, she was able to get it patented. She was already working in a Research and Development institute and knew the importance of patent of an invention. She knew how to file a patent application and how to meet its all requirements. The patent would provide economic benefit for the coming twenty years. It was a success story of a women inventor.

## 7.2. Case study 2

Dr Hifza Rasheed worked in the water sector as a Director Water Quality in Pakistan Council of Research in Water Resources (PCRWR). She started her career in PCRWR in the year 2002. During this time the issue of drinking water contamination, specially of arsenic had caught the attention of the Government and International agencies. UNICEF Pakistan carried out a survey on water quality in 20 districts of Punjab, and Sindh. The results were alarming. An extremely high concentration of arsenic and pathological elements was found in drinking water in these districts. The survey showed a result of more than 1000 ppb of arsenic, against the international, - US -, standard of 10 pbb and more and Pakistan's standard of 50 pbb or more. Major issues identified due to arsenic and bacteria contamination during the survey included warts, skin hardening, kidney problems as well as problems related to diabetes. International studies had identified 67% diseases including cancer related to arsenic and bacterial presence in drinking water.

Limited successful experiments for removal of arsenic had been carried out in other countries but while the filters removed arsenic, it resulted in increased bacterial

contamination. The challenge was thus to develop a testing device and filter that not only removed arsenic but also destroys present bacteria and was low cost enough to be used at household level in poorer communities.

Dr. Hifza Rasheed took up the challenge and continued experimenting with various options to meet the above three criteria. Finally, in year 2012 she, with her colleague Mr. Aslam Tahir managed to develop a low-cost household level filter that removed arsenic to below 50 PPB, as well as destroying 90% of the harmful bacteria. Funds for this research as well as for manufacturing of the testing and filter kits were provided by the PCRWR. Initially they produced community level filters for a water storage capacity of 300 liters, but then later on shifted to production of household-based filters and testing equipment – suitable for 18 liters and effectively removing arsenic and bacteria contamination in 40 minutes. The process was simple. If the color changed to black it was contaminated with arsenic, if diluted to brown or lesser tones, the arsenic and bacteria was considered to have been removed. It was very cost-effective solution. This was a huge success and was extensively used during natural disasters that struck Pakistan, - floods and earthquakes. The agencies that purchased these kits from PCRWR for their development and relief projects included United Nations Agencies, World Bank, NGOs, and Government Departments.



Application for availing IP rights was filed with the IPO – Pakistan in the year 2008 and was finally awarded in 2012. The reason for delay was lack of understanding of IP requirements related to the invention. It resulted in lengthy correspondences from and to IP, resulting in numerous revisions of the documents related to the filing of claim. These correspondences and revisions continued till 2010 when Hifza Rasheed finally decided to obtain support from a commercial firm to finalize the documentations and file claims for patents. Due to this support and diligent responses from Hifza Rasheed the invention was finally patented.

This case study depicts the picture of difficulties being faced by the women inventers in Pakistan. Lack of information and capacity to file a patent application resulted in delays. Dr. Hifsa had to take support of a law firm to get her invention patented. It resulted in the increasing cost of her patent. But it was a success despite all odds.

## 7.3. Case study 3

Dr Maliha Uroos - Fractionation of lignocellulose biomass into components: cellulose, hemicellulose, and lignin, using green solvent called ionic liquids. Dr Maliha Uroos, Assistant Professor, Institute of Chemistry, Punjab University Lahore Pakistan completed her PhD from Nottingham University United Kingdom. She completed her PhD in 2013 and returned to her parent department – Institute of Chemistry, University of Punjab, as Assistant Professor. There she put all her energies to research. She completed a project published it, and then went for registration with Intellectual Property Office. To her horror she found that if one published her article before patenting, the same invention could not be patented; her own publication labeled the invention as plagiarized.



She then embarked upon another project. This project was regarding fractionation of lignocellulose biomass into components: cellulose, hemicellulose, and lignin, using green solvent called ionic liquids. The outcome could be used by industries related to textile, and paper manufacturing. Her project promised lower production cost and higher effectiveness as compared with conventional methods of fractionation as her invention utilized lower ambience, and with considerable reduction in time. Based on this concept, she had to identify an industrialist for commercialization. Finding the right industrialist was not an easy job; first of all, the industries were primarily male dominant who looked down upon women and were not prepared to interact with her on equal basis; secondly, it was difficult for industrialists to understand the concept of the

invention; their focus remained primarily on how much profit would the invention generate for them, - concept details of the invention was of no interest to them. Once an industrialist understood that it would provide them with substantial savings, resultantly increasing their profit, they agreed to provide bridge funding for the research to the tune of 2.5 million PKR. Based on marketability of her research, she also obtained additional funding from the Higher Education Commission of Pakistan that amounted to 14 million PKR for her research.

After strenuous research, the invention was ready for commercialization. Then came the request from the industrialist that the invention should be patented. She tried to prepare the requisite documentations for application however documentation for patent was a different ball game. She was advised to contact any law firm that dealt with filing of patents, but their fee was extremely prohibitive; it was to the tune of 60-75 thousand PKR which was beyond her means as an Assistant Professor. She then thought of relying on her own skills. She studied and reviewed a number of patents relevant to her invention, and finally taught herself how to file for patent. She completed all documentation and filed for patent on January 29, 2019. However, it is now end September 2019, almost 9 months since filing of her application for patent, and she is yet to be assigned an examiner for examining her application, - the first step towards patenting. The reason is lack of required staff for examining applications for patents. Currently the IP department is yet to process the applications filed in the year 2018. It has been reported that application to award of patents take an average time of three years.

She has no idea as to when her invention would be patented. Meanwhile she continues her research and has a couple of inventions ready for patenting once the ball gets rolling with her first patent. Her motivation for patenting is that patent is a prestigious

acknowledgement of her efforts and also that she would also be the first person, - men or women - in her institute to obtain any patent.

# CHAPTER NO. 8

# CONCLUSION AND SUMMARY

No society can progress without active participation of women folk in every sphere of life. Similarly, it is hard to think of economic development without active participation of women. It has been observed that the countries with gender discrimination are struggling with economic crisis. On the other hand, the economies with women empowerment have progressed rapidly. The developed nations have achieved the current level of economic growth with due participation of women in every aspect of economic development. Whereas developing countries and least developed countries have failed to remove hindrances for women innovators. However, most of the countries are actively working on women empowerment to achieve economic development. India and Bangladesh are good examples. They achieved desired annual economic growth rate by focusing on women empowerment and by encouraging innovative culture in their societies. So, it is a proven fact that women entrepreneurship can grow through the protection of their IPRs. The role of women in economic growth is imperative, at the same time, innovation has become hallmark of progress in the global economy.



It is a need of the hour to increase the role of women in innovation and entrepreneurship to achieve the desired level of global economic growth. It can be achieved by encouraging women in developing countries, including Pakistan, to use the Intellectual Property System. The research aims at strengthening the innovative capacity of the country focusing on increasing participation of women inventors and innovators in the national innovation system by supporting them in using the IP system more effectively. In particular the research proposes to assist and support women inventors and innovators to broaden their awareness, knowledge and use of the IP system through

better support programs, access to mentorship and opportunities to network. It also provides an assessment of the situation of women inventors and innovators in Pakistan.

A total of 2,021 local applications were filed during 2005-2021, out of which 1,449 (71.6%) were filed by men and 572 (26.8%) were filed by women. The ratio of patents to applications are very dismal, both for men as well as for women. For men, the ratio of applications to award of patents is 13:1 while for women it is 10:1. Against a total of 2,021 filed applications, a total of 169 has been granted patent, out of which patents granted to applications from men are 113 (66.8%) and for women are 56 (33.2%) a ratio of 2:1.

Predominant reasons for this dismal status are:

1. Lack of motivation for securing IP rights. The responses were why should we secure property rights? If someone uses my invention so what? The whole society has no qualms about pirating patents. Even if someone pirates an invention then going into litigation is not worth the time, as the wheel of justice turns at too slowly a pace to the comfort of the inventors. A factor of this lack of motivation also lies in lack of awareness about IP registration. Currently most of the inventors belong to academia who have no incentive, either financial or social, to go for IP registration. Earlier patents were allocated equivalency – one patent equal to two publications but lately this facility has been withdrawn by HEC. Without any incentive there is no motivation. Another reason for lack of motivation is delays in IP registration. Currently there is an average of a three-year period between applications and award of patents, as reported by the IP Office. None of the stakeholders has skills in motivation, and behavioral change.

2. Lack of skills to file a claim. The inventors do not have the skills to file a claim. Out of 56 women who got their inventions patented, only one prepared the documents herself, while others resorted to soliciting help from male members of the families, or

friends, and those who could afford the legal fee, they took help from the lawyers. An organization is only as good as its staff. While ORIC has the mandate to support inventors in filing claims, the capacity of staff responsible for supporting inventors has been found to be seriously lacking.

3. Outreach: There are inventors and innovators in the informal sector who have not yet been reached out. This is particularly true for skills localized in geographical areas, who are custodians of traditional skills passed down to them through generations. There is no system to reach out to them and help them secure their intellectual rights.

## 8.1. Recommendations

1. The stakeholders dealing with IP issues, need to be trained in skills to effect behavioral changes – skills for motivation. Given the absence of motivational skills in the current partners, it is suggested to outsource this activity to a Civil Society Organization (CSO) who are familiar with such approaches. Same CSO should also be tasked to outreach cultural hubs and help the indigenous inventors and innovators people in securing intellectual property rights for their innovations.

2. The capacity of stakeholders needs to be built to be able to effectively support the inventors in filing claims. A third party could be contracted out who can be tasked to build the capacity of stakeholders in filing claims – through a result-based assignment. Once the stake holders are capacitated to file claims, as per requirements of IP registration, the workload on IP offices will be reduced resulting in faster award of patents to the satisfaction of the inventors and innovators.

3. ORICs are one category of stakeholders who have the mandate of for increasing access of inventors and innovators to IP system. Their capacity building will help increase access of women inventors and innovator to the IP system, and subsequent

commercialization of the inventions. There is however one limitation. Their outreach will be limited to inventors from academia only. The R&D institutions and indigenous innovations will be left out.

4. For this purpose, it is suggested that a project be launched focusing on women inventers and innovators, steered by a Steering Committee represented by nominees from IPO-P, HEC, Lawyers Association, R&D Institute, and Federation of Chamber of Commerce and Industry, and supported by a Project Director (PD). The Steering Committee assisted by the PD will provide policy guidance on the project and provide coordination with their respective offices / units in the country.

7. CSOs should be contracted through competitive bidding for providing services of capacity building of stakeholders on claim filing, preparing claims, and carrying out motivation campaigns – bound by yearly targets of results and outcomes, not on inputs, and outreaching indigenous innovators. The CSOs would hire competent staff for capacity building, motivation, commercialization, and claim filing. The CSO so contracted will have offices at all major hubs of inventions and innovations. Separate NGOs could be hired for different provinces. These CSOs will be tasked to bring indigenous innovators into the IP net. The CSOs will form cooperatives of the indigenous skilled persons, federated at convenient and functional levels, and a financial arrangement made out of earnings of the cooperatives to hire services of trained lawyers for properly filing claims. These Cooperatives will be registered with the relevant Government body to ensure that the interest of members is not compromised.

8. The project should be funded by WIPO for a period of 5 years, thence onwards the ORICs will take over the project induced functions within academia, while the cooperatives will take over the responsibility of sustained access of indigenous

innovations to the IP System. Funding should include the cost of mobilization and motivation, technical capacity building, and equipment to support easy access to global data base on patents.

9. TISCs is a good intervention but it needs to be established in all ORICs as well as in all R&D institutes. Ideally the ORICs could take over the functions of TISCs., with a cell that deals with indigenous innovators – thus having a one window operation for an IP related matter.

10. The Steering Committee to continue even after the project ends and incorporated into the system through relevant law / rules.

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# APPENDIX

## Annex A - Illustrative Questions for Each Research Questions

Q. What are the issues and challenges of women innovators to protect and to commercialize their innovations?

From Applicants who were awarded patents:

a. What is the nature of product that you have invented or innovated?
b. What purpose will that product serve?
c. Have you registered it with IPO; under which IPR? Patent, Copyright, Design, Trademark?
d. Have you registered it with IPO under Patent?
e. When did you get it registered? Why did you feel the need to get it registered?
f. What problems did you face? Time taken; number of times visit of office. Staff behavior? Documentation? Did you file yourself or you had to hire someone to complete the files? Why did you not do it yourself? What other problems did you face in registration? What obstacles you had to overcome?
g. Can you name any organization or individuals or associations or women's networks, institutions or individuals or likely investors, who could provide financial or technical support to women inventors and innovators in IPR?

**From inventors who did not apply for IP registration:**

a. What is the nature of product that you have invented or innovated?
b. What purpose will that product serve?
c. Have you registered it with IPO; under which IPR? Patent, Copyright, Design, Trademark

d. Why did you not apply for registration?

e. Why did you not feel the need to get it registered?

f. What problems did you face because of non-registration?

g. What support would have enabled you to get your invention patented?

**Q. What are the major initiatives in the country designed to support women innovators?**

a. Name the programs in the country designed to support ONLY women inventors and innovators

b. Is there any program or initiative only for women?

c. Is there any need to have a dedicated program for women inventors and innovators to encourage them to use IPR

# Annex A1 - Sample Questionnaire from ORIC

Name of University:

Name of City:

Name of ORIC Focal Person:

Cell Number:

Email:

Names of the women researchers' innovators and inventers – who completed the research (attach list)

| | |
|---|---|
| Number of marketable research conducted by women innovators and inventers and supported by HEC | |
| Number of women innovators and inventers led research marketed | |
| Name of company that bought the research from women innovators and inventers | |
| Number of research conducted by women and support by private sector institutions / industry / corporate sector | |
| Number of patents filed by women innovators and inventers | |
| Number of patents filed on behalf of women innovators and inventers | |
| Number of patent granted / issued | |
| Number of applications denied for grant | |
| Number of applications subjected to opposition | |
| Number of applications pending with Intellectual Property Organization (IPO) | |
| Number of women patent grant cases in the court of law | |

I. Views of the focal person of ORIC in the light of his / her experience

In your opinion what are the major issues being faced by women innovators in their access to IP system, for protecting their intellectual property rights? In other words, why don't most women innovators and inventers get their research registered with Intellectual Property Organization (IPO)

The issues and challenges faced by the women inventors are enlisted below

1. Lack of resources availability
2. Proper guidance regarding documentation
3. Male dominant society
4. Limited offices in Pakistan
5. Confusion and hesitation in filling forms

Challenges:

1. Proper team formation
2. Availability of research data
3. Limited technical laboratory infrastructure
4. Lack of information
5. Lack of subject expert mentorship
6. Conflict of research interest with academia

There are very less numbers of women who, doesn't want to register their patent and IP with IPO. Few reasons are above mentioned but the most important element is motivation, consistency, and patience in getting the desire result in research. Few of women inventors and innovators lack in self-motivation and loss their patience element which trickle them down in counterproductive.

Do you know of any program designed to support women inventers and innovators in ensuring their intellectual rights? If yes, please list some programs / initiatives that you know of.

Can you list three major stakeholders, institutions, organizations, NGOs, networks, and individuals active in the field who are providing or could provide financial or even technical support to women inventors and innovators in accessing IP system.

Can you list three major stakeholders, institutions, organizations, NGOs, networks, and individuals active in the field who are providing or could provide financial or even technical support to women inventors and innovators in accessing IP system.

List (Addresses and contact persons if available) of entities for providing Financial Support

Can You Identify two to three leading women inventors and innovators who could be potential mentors for new women innovators and inventers

Can You Identify any leading volunteer lawyers' firms that may consider providing free or subsidized IP legal support?

Can you please identify ONE institution (s), center(s) or organization(s) in the country in which a focal point of providing support to women innovators and inventers in ensuring their intellectual property rights?

If the reply to the above question is positive, then suggest a possible structure or how such a center should be organized.

Identify three successful women inventers and innovators who made effective use of IP System for enhancing their invention to markets. We would like to follow up by developing case studies of these women for publishing in international reports

**QUESTIONS FOR RESEARCHERS**

II. Views of some researchers in the university who applied for registration with IPO and were granted patent

Q1. In your opinion what are the major challenges and obstacles faced by women inventors and innovators in their access to and use of the Intellectual Property (IP)

system, for protecting their intellectual property rights? In other words, why don't most women innovators and inventers apply for patenting of their research with Intellectual Property Organization (IPO)

III views of some researchers in the university who applied for registration with IPO but whose applications were refused

Q1. What are the issues and challenges of women innovators to protect and to commercialize their innovations? In other words, why don't most women innovators and inventers apply for registration with Intellectual Property Organization (IPO)

IV. Views of researchers in the university who never applied for registration with IPO

Q1. What was the main reason for your not applying for patent registration of your invention?

Q2. In your opinion why don't most women innovators and inventers apply for registration of their research with Intellectual Property Organization (IPO)

# Annex B - Fee Structure for Patenting

**Table 8: Fee Structure for Patenting**

| Fee for Patenting | Amount in PKR |
|---|---|
| Application for patent when the true and first inventor is sole or joint applicant | 6750.00 |
| For each additional page of specification beyond 40 pages. | 90.00 |
| For each additional claim beyond 20 claims | 225.00 |
| Application for patent when the true and first inventor is NOT a party to the application | 6750.00 |
| For each additional page of specification beyond 40 pages. | 90.00 |
| For each additional claim beyond 20 claims | 225.00 |
| Application for patent of addition when the true and first inventor is sole or joint applicant | 6750.00 |
| For each additional page of specification beyond 40 pages. | 90.00 |
| For each additional claim beyond 20 claims | 225.00 |
| Application for patent of addition when the true and first inventor is NOT a party to the application | 6750.00 |
| For each additional page of specification beyond 40 pages. | 90.00 |
| For each additional claim beyond 20 claims | 225.00 |
| Convention application for patent when the true and first inventor is sole or joint applicant | 6750.00 |
| For each additional page of specification beyond 40 pages. | 90.00 |
| For each additional claim beyond 20 claims | 225.00 |
| Convention application for patent when the true and first inventor is NOT a party to the application | 6750.00 |
| For each additional page of specification beyond 40 pages. | 90.00 |
| For each additional claim beyond 20 claims | 225.00 |
| Convention application for patent of addition | 6750.00 |
| For each additional page of specification beyond 40 pages. | 90.00 |
| For each additional claim beyond 20 claims | 225.00 |
| Convention application for patent of addition when the true and first inventor is NOT a party to the application | 6750.00 |
| For each additional page of specification beyond 40 pages. | 90.00 |
| For each additional claim beyond 20 claims | 225.00 |

| | |
|---|---|
| Application for provisional specification | 2025.00 |
| For each additional page of specification beyond 40 pages. | 90.00 |
| For each additional claim beyond 20 claims | 225.00 |
| Application for complete specification | 4725.00 |
| For each additional page of specification beyond 40 pages. | 90.00 |
| For each additional claim beyond 20 claims | 225.00 |

# Annex C - Time Duration in Granting of Patent

## Table 8. Time Duration between Application and Award of Patent

| | | | | Time duration between application and award of patent | | | | |
|---|---|---|---|---|---|---|---|---|
| **Filing date** | **Registration date** | Days | Year | less than 1 year | 1-2 Years | 2-3 Years | 3-4 Years | More than 4 years |
| **5-Jun-07** | **8-Nov-12** | 1983 | 5.4 | | | | | 1 |
| 03/04/2008 | 11/01/2012 | 1703 | 4.7 | | | | | 1 |
| 05/05/2008 | 02/10/2009 | 281 | 0.8 | 1 | | | | |
| 21-Jun-08 | 26-May-09 | 339 | 0.9 | 1 | | | | |
| 28-Jun-08 | 10/11/2009 | 470 | 1.3 | | 1 | | | |
| 12-Jul-08 | 24-Mar-10 | 620 | 1.7 | | 1 | | | |
| 12/07/2008 | 08/03/2010 | 604 | 1.7 | | 1 | | | |
| 19-Jul-08 | 22-Feb-12 | 1313 | 3.6 | | | | 1 | |
| 20-Jul-08 | 23-Feb-12 | 1313 | 3.6 | | | | 1 | |
| 21-Jul-08 | 24-Feb-12 | 1313 | 3.6 | | | | 1 | |
| 22-Jul-08 | 25-Feb-12 | 1313 | 3.6 | | | | 1 | |
| 23-Jul-08 | 26-Feb-12 | 1313 | 3.6 | | | | 1 | |
| 23-Jul-08 | 11/12/2010 | 842 | 2.3 | | | 1 | | |
| 19-Aug-08 | 11/11/2011 | 1179 | 3.2 | | | | 1 | |
| 23-Aug-08 | 25-Jan-10 | 520 | 1.4 | | 1 | | | |
| 01/09/2008 | 08/03/2010 | 937 | 2.6 | | | 1 | | |
| 31-Dec-08 | 24-Apr-09 | 114 | 0.3 | 1 | | | | |
| 23-Jan-09 | 25-Jan-11 | 732 | 2.0 | | | 1 | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 9-Mar-09 | 15-Jan-10 | 312 | 0.9 | 1 | | | | |
| 7-May-09 | 07/05/2011 | 789 | 2.2 | | | 1 | | |
| 6-Aug-09 | 25-Jan-10 | 172 | 0.5 | 1 | | | | |
| 06/08/2009 | 03/02/2014 | 1728 | 4.7 | | | | | 1 |
| 25-Nov-09 | 29-Apr-10 | 155 | 0.4 | 1 | | | | |
| 26-Nov-09 | 05/05/2010 | 160 | 0.4 | 1 | | | | |
| 14-Jan-10 | 26-Jan-11 | 377 | 1.0 | | 1 | | | |
| 14-Jun-10 | 22-Dec-14 | 1652 | 4.5 | | | | | 1 |
| 12-Jan-11 | 28-Jun-13 | 898 | 2.5 | | | 1 | | |
| 21-Feb-11 | 23-Sep-13 | 945 | 2.6 | | | 1 | | |
| 21-Feb-11 | 14-Jan-13 | 693 | 1.9 | | 1 | | | |
| 22-Feb-11 | 11/01/2013 | 983 | 2.7 | | | 1 | | |
| 22-Jun-11 | 05/07/2012 | 320 | 0.9 | 1 | | | | |
| 16-Sep-11 | 23-Jul-15 | 1406 | 3.9 | | | | 1 | |

## Annex D - List of TISCs

| City | List of TISCs |
|---|---|
| D I Khan | Gomal University, D.I. Khan Punjab Pakistan |
| Faisalabad | University of Agriculture, Faisalabad, Punjab, Pakistan |
| Gujrat | University of Gujrat, Gujrat, Punjab, Pakistan |
| Haripur | University of Haripur, Haripur, Khyber Pakhtunkhwa, Pakistan |
| Hyderabad | Mehran University of Engineering and Technology, Hyderabad Sindh, Pakistan |
| Islamabad | Institute of Space Technology, Islamabad. Pakistan |
| Islamabad | Riphah International University Islamabad, Pakistan |
| Islamabad | National University of Science and Technology, Islamabad, Pakistan |
| Islamabad | COMSATS University of Technology, Islamabad, Pakistan |
| Islamabad | Small and Medium Enterprise Development Authority, Islamabad |
| Islamabad | Intellectual Property Organization of Pakistan, Islamabad |
| Islamabad | Air University, Islamabad, Pakistan |
| Islamabad | HEC Pakistan, Islamabad |
| Karachi | Pakistan Scientific and Technological Information Center, Islamabad, Pakistan |
| Karachi | University of Karachi, Karachi Sindh, Pakistan |
| Karachi | NED University Karachi, Sindh, Pakistan |
| Karachi | Aga Khan University Karachi, Sindh, Pakistan |
| Karachi | DOW University of Heath Sciences, Karachi, Pakistan |
| Karachi | Pakistan Council of Scientific and Industrial Research, Karachi |
| Lahore | Lahore University of Management Sciences, Punjab Pakistan |
| Lahore | University of Punjab, Lahore, Punjab, Pakistan |
| Lahore | University of Veterinary and Animal Sciences Lahore, Punjab, Pakistan |
| Lahore | Lahore College for Women University, Lahore, Punjab, Pakistan |
| Peshawar | University of Peshawar, Peshawar, Khyber Pakhtunkhwa, Pakistan |
| Peshawar | University of Engineering and Technology, Peshawar, Khyber Pakhtunkhwa, Pakistan |

| | |
|---|---|
| Quetta | Balochistan University of Information Technology Engineering and Management Sciences (BUITEMS) Quetta, Balochistan, Pakistan |
| Quetta | University of Balochistan, Quetta, Balochistan. |
| Sargodha | University of Sargodha, Sargodha, Punjab, Pakistan |
| Sialkot | Government College of Women Silakot, Punjab, Pakistan |
| Sialkot | Sialkot Chamber of Commerce and Industry, Sialkot, Punjab, Pakistan |

## Annex E List of Interviewee

1. Mr. Mujeeb Ahmed Khan, Chairman, IPO-Pakistan, Islamabad.
2. Mr. Muhammad Irfan Tarar, Director General, IPO-Pakistan, Islamabad.
3. Dr. Rizwan Basharat, Director (Lahore Office) IPO-Pakistan, Islamabad.
4. Mr. Muhammad Rafiq, Registrar, Trade Mark Registry, Karachi.
5. Mr. Fayyaz Ahmed. Controller, Patent Office, Karachi.
6. Mr. Nasrullah Khan, Registrar, Copyright Office, Karachi.
7. Mr. Ghulam Mujtaba Kamal, Assistant Controller, the Patent Office, Karachi.
8. Ms. Saima Kanwal, Assistant Controller Patent, IPO-Pakistan
9. Ms. Faryal Javed, TISC Officer, IPO-Pakistan
10. Prof. Dr Nassar Ikram, Pro-Rector, National University of Sciences and Technology (NUST), Islamabad.
11. Ms. Irum Zaidi, GM IP, National University of Sciences and Technology (NUST), Islamabad.
12. Mr. Ahsan Ahmad, CEO, ESOLPK, Islamabad.

# GLOSSARY

| | |
|---|---|
| CSO | Civil Society Organization |
| EDMS | Electronic Document Management System |
| EU | European Union |
| FBR | Federal Board of Revenue |
| IP | Intellectual Property |
| IPAS | Industrial Property Automation System |
| IPO | Intellectual Property Organization |
| IPR | Intellectual Property Rights |
| IT | Information Technology |
| MNCs | Multinational Companies |
| MoC | Ministry of Commerce |
| MoIT | Ministry of Information Technology and Telecommunication |
| MS | Microsoft |
| NITB | National Information Technology Board |
| NUST | National University of Science & Technology |

| | |
|---|---|
| NTS | National Testing Service |
| ORIC | Office of Innovation Research and Commercialization |
| PEMRA | Pakistan Electronic Media Regulatory Authority |
| PCRWR | Pakistan Council of Research in Water Resources |
| PCT | Patent Cooperation Treaty |
| PITB | Punjab Information Technology Board |
| TMO | Technology Management office |
| TMR | Trade Mark Registry |
| TRIPs | Trade Related Intellectual Property Rights |
| TRTA | Trade Related Technical Assistance |
| USTR | United States Trade Representative |
| VPN | Virtual Private Network |
| WIPO | World Intellectual Property Organization |
| WTO | World Trade Organization |