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UNIVERSITY
Indira Gandhi National Open University
School of Law

Emerging Issues in Patenting

4

"शिक्षा मानव को बन्धनों से मुक्त करती है और आज के युग में तो यह लोकतंत्र की भावना का आधार भी है। जन्म तथा अन्य कारणों से उत्पन्न जाति एवं वर्गगत विषमताओं को दूर करते हुए मनुष्य को इन सबसे ऊपर उठाती है।"

-इन्दिरा गांधी

" Education is a liberating force, and in our age it is also a democratising force, cutting across the barriers of caste and class, smoothing out inequalities imposed by birth and other circumstances"

- Indira Gandhi

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BLOCK 4 EMERGING ISSUES IN PATENTING

The Block comprises of four units.

Unit 13 deals with PCT and International Patent filing strategies. This unit includes in it structure of patent document, the International Patent classification, the different types of searches, the different sources of Patent information etc.

Unit 14 deals with technology transfer. It deals with technology transfer activities before and after signing the patent license agreement. It further discusses issues like the dynamic relationship between IPR activity, technology transfer and commercialization, the partnerships in technology transfer and development different methods of technology.

Unit 15 deals with the patent and the Indian biodiversity act. It elaborates on the convention on the Biological Diversity Act (CBDA) and the provisions in the Biodiversity Act (BDA). It deals with other issues functions and powers of National Biodiversity Authority (NBA) and State Biodiversity Board.

UNIT 13 PATENT CO-OPERATION TREATY AND INTERNATIONAL PATENT FILING STRATEGIES

Structure

13.1 INTRODUCTION

PCT is the acronym for Patent Cooperation Treaty (PCT), a sister Treaty of the Paris Convention administered by the World Intellectual Property Organization (WIPO). This Treaty came into force in 1978. PCT is an agreement to facilitate international cooperation in the field of patents. It is a special agreement under the Paris Convention open only to states, which are also party to the Paris Convention.

It facilitates filing of patent applications under a single umbrella and provides for high quality novelty search and preliminary examination of such applications. The PCT system is a simplified and cost-effective method of filing patent applications throughout the world. There are now over 144 signatory countries to PCT. The PCT establishes a system which allows the filing of a single application (international application) with a single patent Office (receiving office) having the effect in each of the countries, who are signatories to the treaty. India joined Paris Convention for the protection of Industrial Property with effect from Dec.7, 1998 and became is a signatory member to Patent Co-operation Treaty (PCT) with effect from Dec.7, 1998.

13.2 OBJECTIVES

After reading this unit, you should be able to:

- explain PCT and the need for protecting our inventions abroad;
- describe PCT route for filing patent application;
- mention the procedure for filing a PCT;
- describe the strategic which should be followed by application for PCT filing; and
- explain the benefits of using PCT system.

13.3 NEED FOR PROTECTING INVENTIONS ABROAD

Businesses, both small and large, use acquiring of patents as a key management function, to protect their inventions and innovations embodied in the new and improved products and processes. In view of the fact that patent rights are territorial in nature, one needs to file patent application in the countries where there is a likelihood of marketing a patented product has grown substantially. As a result, more than a million patents are filed globally every year for new products, processes, applications and uses. These patents are used by the companies to enhance and leveraged their positioning in the market. Large firms file patents worldwide in developed, developing, underdeveloped as well as emerging markets. With huge investments deployed in the development of new technologies, as well as competition in the upcoming fields, protecting securing IPRs has become the need of the hour for survival of an organization.

As regards the options available to protect an invention in foreign countries are concerned, the following routes could be followed:

a) Separate patent applications can be filed at the same time in all the countries where one would like to protect his invention;

b) A patent application can be filed in a member country of Paris Convention country followed by filing of separate corresponding patent applications in other Paris Convention countries within 12 months taking priority from its filing date (called priority date);

c) An international patent application under PCT can be filed at the Indian Patent Office, which is simpler, easier and more cost-effective than following the options at (a) or (b). PCT Filing route is especially cost effective if the patent protection is sought in more than five countries.

13.4 USING PCT ROUTE FOR FILING PATENT APPLICATIONS

The patent rights are territorial in nature and still a subject matter governed by the domestic laws of each country. Under the traditional patent system, an individual application need to be filed in each country where patent protection is sought. Applicants from members of Paris convention can claim priority of an earlier application for a corresponding patent application filed subsequently in convention countries within a period of one year from the filing of the earlier application (also termed as priority application). PCT is an international filing system for patents providing the applicant an international filing date in all of the member countries and allowing the late entry (generally up to 30/31 months) to the national offices for seeking national patents without affecting the priority date.

13.5 WHAT CANNOT BE PROTECTED VIA PCT

The PCT does not provide for the grant of any International patent. The patent related subject matter (patents for inventions, Utility Models, Petty patents, inventor's certificates, Certificate of Addition etc) are protected under PCT. However, it is not possible to define the form of protection at the PCT stage and can be specified during the national filing phase. Filings or Registrations of the other forms of IP protection like Copyright, Trademarks, Geographical Indications, Trade secrets are not covered under PCT system. Only, the subject matter for an Invention can be included in an International Patent Application. Under the PCT system, one can include the subject matter for which patent protection can be granted in any of the member states. For example, the new use of a known compound is not patentable in India but a PCT application can be filed for such new use for protection in all those member states where such protection is possible. Similarly, software per se is not patentable in India but a PCT application can be filed to obtain the protection in those countries where such protection is possible.

13.6 EFFECTS OF INTERNATIONAL PATENT FILING UNDER PCT

In general terms, an international patent application, complying with the minimum requirements for obtaining an international filing date, has the effect of a national patent application (and certain regional patent applications) in all PCT Contracting States. An international patent application must be prepared in accordance with certain formal requirements set out in the Treaty and Regulations, which have become international standards effective in all of the PCT Contracting States. If these requirements are complied with, subsequent adaptation to varying national (or regional) formal requirements (and the cost associated therewith) will not be necessary.

13.7 PATENT APPLICATION

An international Patent application can be filed with the national patent Office, or directly with WIPO subject to compliance with the provisions available under the national security provisions in the domestic patent law. Both of those Offices act as PCT "receiving Offices". If the applicant is a national or resident of a country which is party to the ARIPO Harare Protocol, the OAPI Bangui Agreement, the Eurasian Patent Convention or the European Patent Convention, he may alternatively file the international patent application with the regional patent Office concerned, if permitted by the applicable national law.

13.8 WHO CAN FILE AN INTERNATIONAL PATENT APPLICATION

Nationals and residents of a contracting States are entitled to file international applications for patents under PCT. In case of more than one applicant, at least one applicant needs to be a national/resident of a contracting country.

Self Assessment Question **(Spend 3 minutes)**

1) What is PCT?

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2) Who can file an International Patent Application and where?

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13.9 GENERAL PROCEDURE OF PCT FILING

PCT procedure consists of two phases, International (PCT) Application filing phase followed by National phase Entry of International Patent Application. The PCT procedure includes the following steps:

- **Filing:** an international application is filed by an applicant, complying with the PCT formality requirements, in one language, and one set of fees is paid which includes official and transmittal fees.

- **International Search:** Some of the Patent offices equipped with PCT minimum documentation have been recognized as "International Searching Authority (ISA)". There are fifteen ISAs in the world. India recognizes six of them. After filing the International Patent application, an International search is conducted by an ISA. The applicant has the right to choose one of the ISAs for the purpose. The cost of International Search varies from one ISA to another. It may be noted that an ISA would search the subject matter related to a single application and may direct the applicant to deposit the fees for additional searches, if required. ISA would within 9 months from priority date of the application or within three months after the completion of the priority period, depending upon the filing strategy used by the applicant. ISA as issued identifies the published documents which include patent as well as non-patent literature which may anticipate and/or make one or more claims in a patent application obvious. The patentability opinion would include observations of the search examiners on novelty, non obviousness and industrial application.

- **International Publication:** The patent application as filed is published by the PCT office as soon as possible after the expiration of 18 months from the earliest filing date (priority date), disclosing thereby the content of that international application in public domain. Filing, international search and patentability opinion constitute proceedings under Chapter I of PCT.

- **International Preliminary Examination:** These requirements fall under Chapter II of PCT. At the request of the applicant, one of the ISAs as selected by the applicant may carry out "International Preliminary Examination" which is requested in the form of filing a Demand by 19th month from the priority date of the application. Filing of demand is stretchable by 22nd month but advisable to be completed by 19th month because of the non-compatibilities of the systems in certain cases. This examination carried out by International Preliminary Examining Authority (IPEA) is a detailed and thorough patentability analysis, on an International Patent Application as filed or amended as permissible under the PCT Rules and regulations. This phase provides an opportunity to the applicant or his agent to respond to the International Preliminary Examination Report (IPER) issued by the IPEA and send rebuttals to the examiner's objections. After considering applicant's written response, the examiner may reconsider his objections and waive the requirements where he is satisfied with the applicant's observations and establish the "Written Opinion" by 28th month from the priority date of the patent application.

- **National Phase:** After the completion of the PCT procedure in upto 30/31 months, the applicant starts to pursue the application for grant of the patents directly before the national (or regional) patent Offices of the countries in which the applicant wants to protect the invention. In those countries, where translation requirements are to be met, a translated version of the patent application has to be filed at the time of national phase filing. The national offices may, at their discretion, review the claims and may raise further official actions as per the requirements under the domestic law. After meeting the requirements of national patent offices, the patent application may proceed for the grant.

Self Assessment Question **(Spend 3 minutes)**

3) Which Language can we file a International Patent Application in?

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13.10 STRATEGIES FOLLOWED BY APPLICANTS FOR PCT FILINGS

PCT route is economical only if one is seeking the patent protection in a number of countries. Therefore, deciding upon the filing route is very crucial. It is also extremely useful and cost effective if the applicant is not sure about the commercial potential of the invention at the initial stages and he needs time to search for an interested licensee or venture capitalist who could take his invention for further development and exploitation. ISR would also give an idea to the applicant about the space where his invention is placed with respect to the patents taken by other competitors. Depending upon the nature of the invention and its advantages, the applicant can decide as to how to proceed further. Due to huge investment involved in the R&D, it becomes crucial for the applicant to take a decision to secure the protection for his technology in the relevant markets depending upon the IP budget available with him. All these concerns are considered together while formulating a patent strategy for the purpose. Some of the strategies which one can adopt are listed below:

- Strategy 1: One of the options for an applicant would be to file a provisional specification at the National Patent Office followed by an International application under PCT. This option gives the applicant more time upto one year to fine-tune the documents and improve upon the disclosure, as the case may be. It can be followed by filing of complete specification and a PCT filing within 12 months from date of provisional filing to secure the priority.

- Strategy 2: In case a complete specification was filed in the first instance, one can file the International Patent Application under PCT within one year from the date of filing the complete application.

- Strategy 3: There are situations where the subject matter of a patent application is not patentable in India. In such cases, one can obtain a foreign filing permission from the Indian Patent Office and file an International Patent Application directly accompanied with a foreign filing permission

The above strategies are explained in the flow chart given at the end of the Chapter.

13.11 REQUIREMENTS FOR FILING INTERNATIONAL PATENT APPLICATIONS

The international application must contain a request, a description, one or more claims, one or more drawings (if applicable) and an abstract. It must comply with the prescribed physical requirements for filing applications. The specification must be in one of the prescribed languages. In case, an application is filed in the local language, the English translation for the same must be filed within a period as may be prescribed by the patent office. The prescribed fees must be paid. The International Application should contain at least the following elements:

- Patent specification in triplicate
- Drawings (if any), abstract, sequence listing.
- An indication that it is intended to be an International Application,
- The designation of at least one Contracting State
- The name of the applicant in a form allowing the applicant's identity to be established,
- One or more claims.

{The fees for the various proceedings are given at the end of the Chapter}

13.12 FEE REDUCTION PROVISIONS IN PCT

There are provisions for fee reduction in PCT. In case of applications being filed electronically, fee reductions are available depending on the type of filing and format of the application being submitted. 75% fee reduction is provided in case of applicants those are national of and reside in a State whose per capita national income is below 3,000 US dollars or country classified by the United Nations as a "least developed country". In case, there is more than one applicant, each must satisfy these conditions.

13.13 LANGUAGE OF THE APPLICATION

The international patent application can be filed in any language which is accepted by the Receiving Office. However, if that language is not accepted by ISA, the applicant is required to submit a translation of the application. Receiving Offices are obliged to accept filings in at least one language which is both a language accepted by the competent International Searching Authority that is to carry out the international search and a "publication language", that is, one of the languages in which international patent applications are published (Chinese, English, French, German, Japanese, Russian and Spanish).

13.14 OPTING FOR AN ISA

The following National Patent Offices have been appointed by the PCT Contracting States as International Searching Authorities (ISAs): the national Offices of Australia,

Austria, Canada, China, Finland, Japan, the Republic of Korea, the Russian Federation, Spain, Sweden and the United States of America, and the European Patent Office. The availability of a particular ISA to the nationals or residents of a country is determined by the receiving Office where the international application was filed. Some receiving Offices provide a choice of more than one competent ISA. Indian Patent Office recognizes six ISAs namely the national Offices of Australia, Austria, China, United States of America, Sweden and European Patent Office.

13.15 INTERNATIONAL SEARCH, INTERNATIONAL PRELIMINARY EXAMINATION AND THEIR ROLE IN EVALUATING INVENTIONS

The results of an International Search are provided in International Search Report provided by one of the internationally recognized Searching Authority for conducting searches on international patent applications filed under PCT system. The purpose of ISR is to identify the relevant Prior Art and a preliminary opinion on patentability is also provided along with the search report. The relevant contents of an ISR are as follows:

i) Relevant citations and documents as prior art

ii) Classification of the subject matter

iii) Fields of search

iv) Grouping of claims as per the patentability criteria namely, Novelty, Inventive Step and Industrial Applicability and indication of allowability and non-allowability of each and every claim as examined by the Search Examiner.

v) Observations

The Symbols used for Various Categories of Citations are as follows:

"A": document defining the general state of the art which is not considered to be of particular relevance

"E": earlier application or patent but published on or after the international filing date

"L": document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O": document refereeing to an oral disclosure, use, exhibition or other means

"P": document published prior to the international filing date but later than the priority date claimed

"T": later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X": document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y": document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&": document member of the same patent family

An ISR is provided to an applicant before the publication of the patent application which enables the applicant to evaluate the chances of obtaining patents in PCT Contracting States. For every international application filed on or after 1 January 2004, the ISA establishes in its international search report, a written opinion which is preliminary and non-binding opinion on the invention as to whether it meets the patentability criteria in light of the search report or not, and also identified those claims which meet the patentability requirements. The patentability opinion is sent to the applicant and to WIPO together with the international search report. This written opinion helps the applicant understand and interpret the results of the search report with specific reference to the text of the international application. This report helps in evaluating the chances of obtaining a patent without incurring the additional cost of international preliminary examination and subsequent cost of national phase filings. Applicants can, if they wish, submit informal comments to WIPO in response to this written opinion. In this way, they have an opportunity to respond to the reasoning and conclusions of the written opinion even if they do not plan to take advantage of international preliminary examination. An international search report, wherein the documents cited are of general background and are not very relevant with respect to the disclosed invention, the applicant can proceed further with processing of his application in those countries where he wishes to obtain protection through early national phase without incurring expenditure on requesting International Preliminary examination. However, If a search report is unfavorable or the examiner's understanding of the invention is not proper, the documents as cited challenging the novelty and/or inventive step of the invention can be addressed by the applicant by way of carrying out amendments to the claims in the international patent application to distinguish the invention from the cited documents, or by brining to the notice the technical clarifications for the better understanding of the invention for the consideration of the examiner at the International Preliminary Examination stage. There would be cases where there would be partial allowability of the claims and such situations can be addressed as suggested earlier. Also, in case of unfavorable report, the applicant has the option to withdraw the application before it is published, saving thereby huge cost involved with filing of foreign patent applications and also avoiding multiple handling of enormous documentation and procedures. The high quality of the international search assures that any patent granted on an international application is less likely to be successfully challenged, and thus provides valuable input in support of investment decisions.

If the applicant does not request international preliminary examination, the written opinion of the ISA will form the basis of the international preliminary report on patentability (Chapter I) which will be communicated by the International Bureau to all PCT Contracting States patent Offices which request it, together with any informal comments submitted. The content of the Report under Chapter I will also

be very useful for patent Offices in deciding whether or not to grant the patent, especially for those Offices which do not carry out significant substantive examination. This report is made available to the public once 30/31 months from the priority date have expired.

In case, an applicant intends to go for International Preliminary examination, he has to file a demand for the same under the provisions of PCT. The examination is done by International Preliminary Examination Authority (IPEA) where the examiner further examines the patent application based on the citations and other relevant documents already cited in the International Search Report (ISR) and may add any further citations if found necessary. The International Preliminary Examination Report (IPER) gives examiner's detailed comments on the novelty, inventive step and utility criteria for all the claims as present on the case and his reasoning as to why these claims could meet or not satisy the patentability criteria. The applicant receives an opportunity to provide his rebuttals which may or may not satisfy the examiner and thus the examiner establishes the patentability opinion in the form of IPER which is communicated to concerned patents offices selected for national phase filings for further consideration under their respective laws.

Self Assessment Question **(Spend 3 minutes)**

4) Discuss the various strategies followed by applicants in using PCT route.

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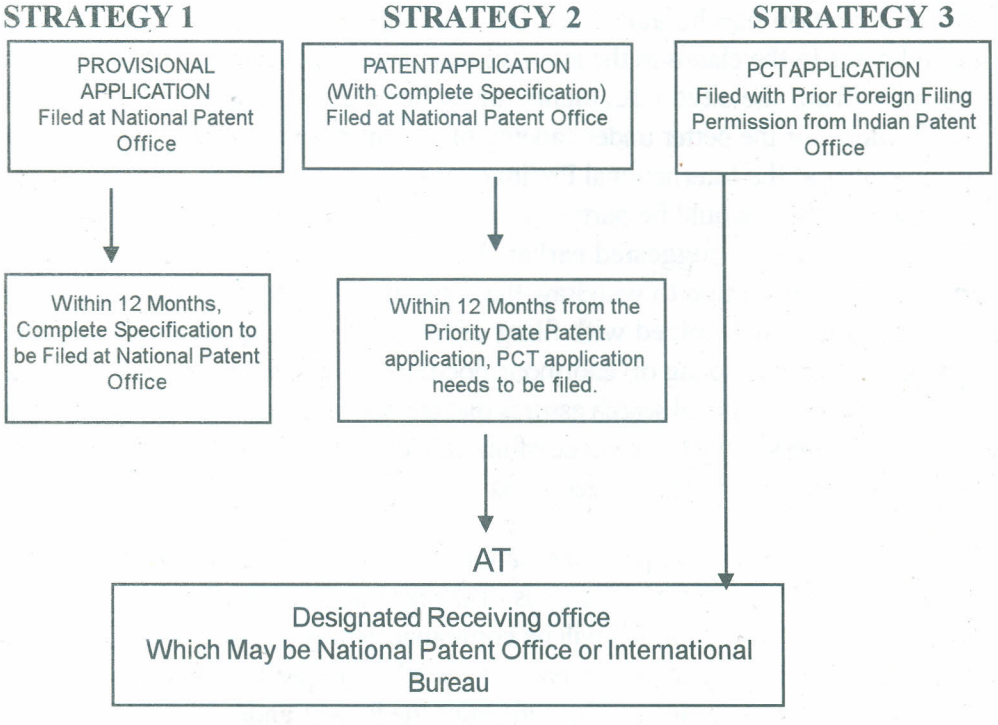
Strategies in Filing PCT Applications



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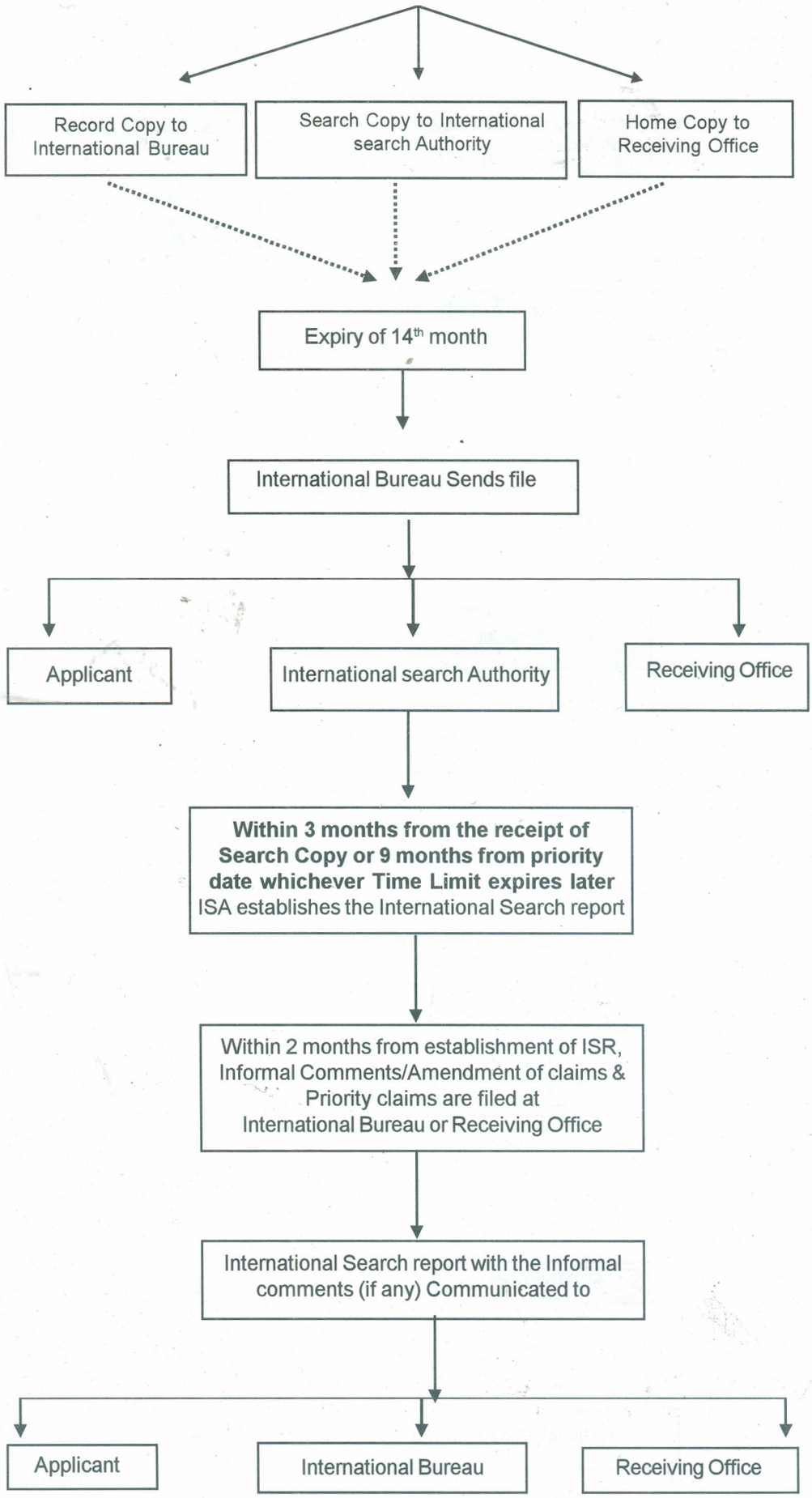
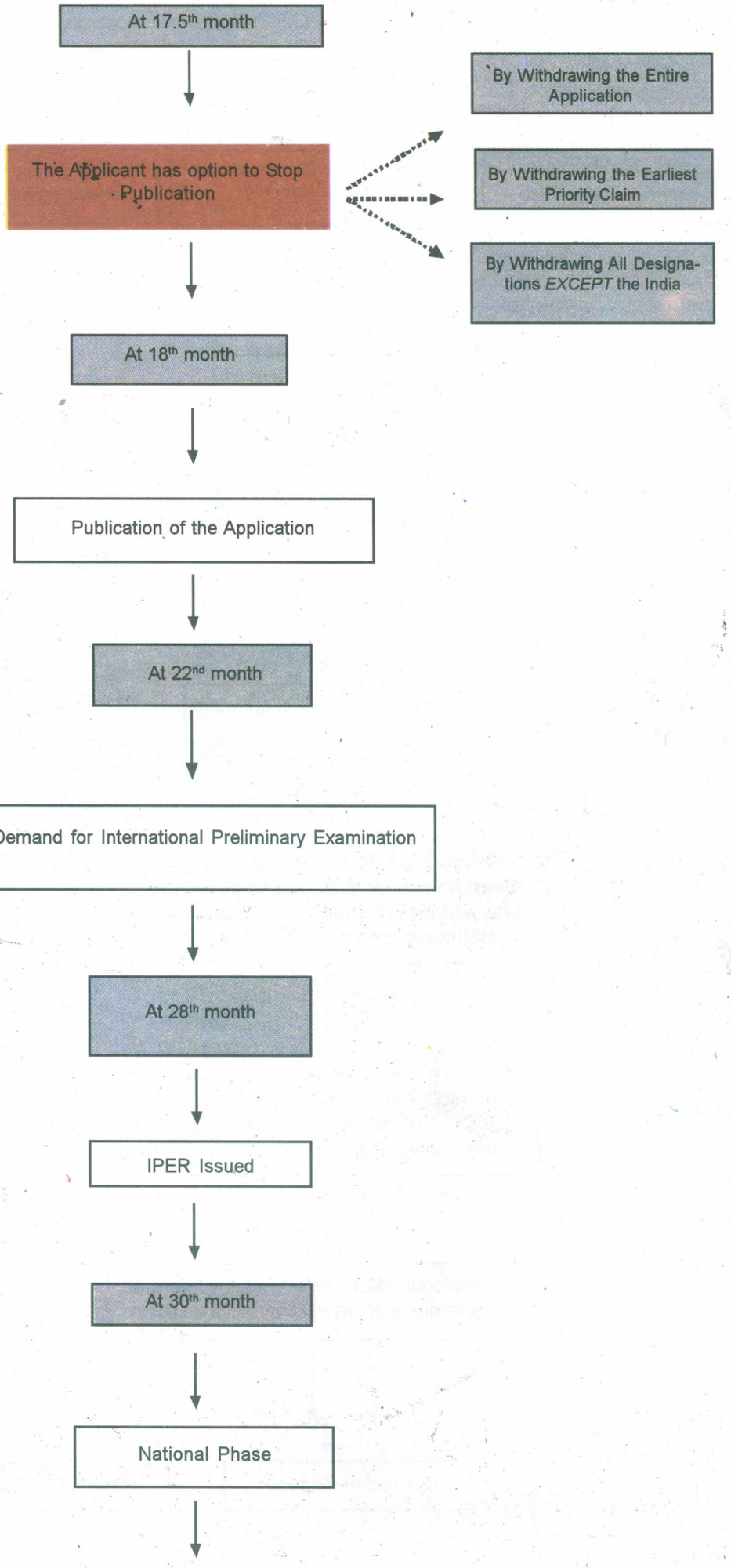
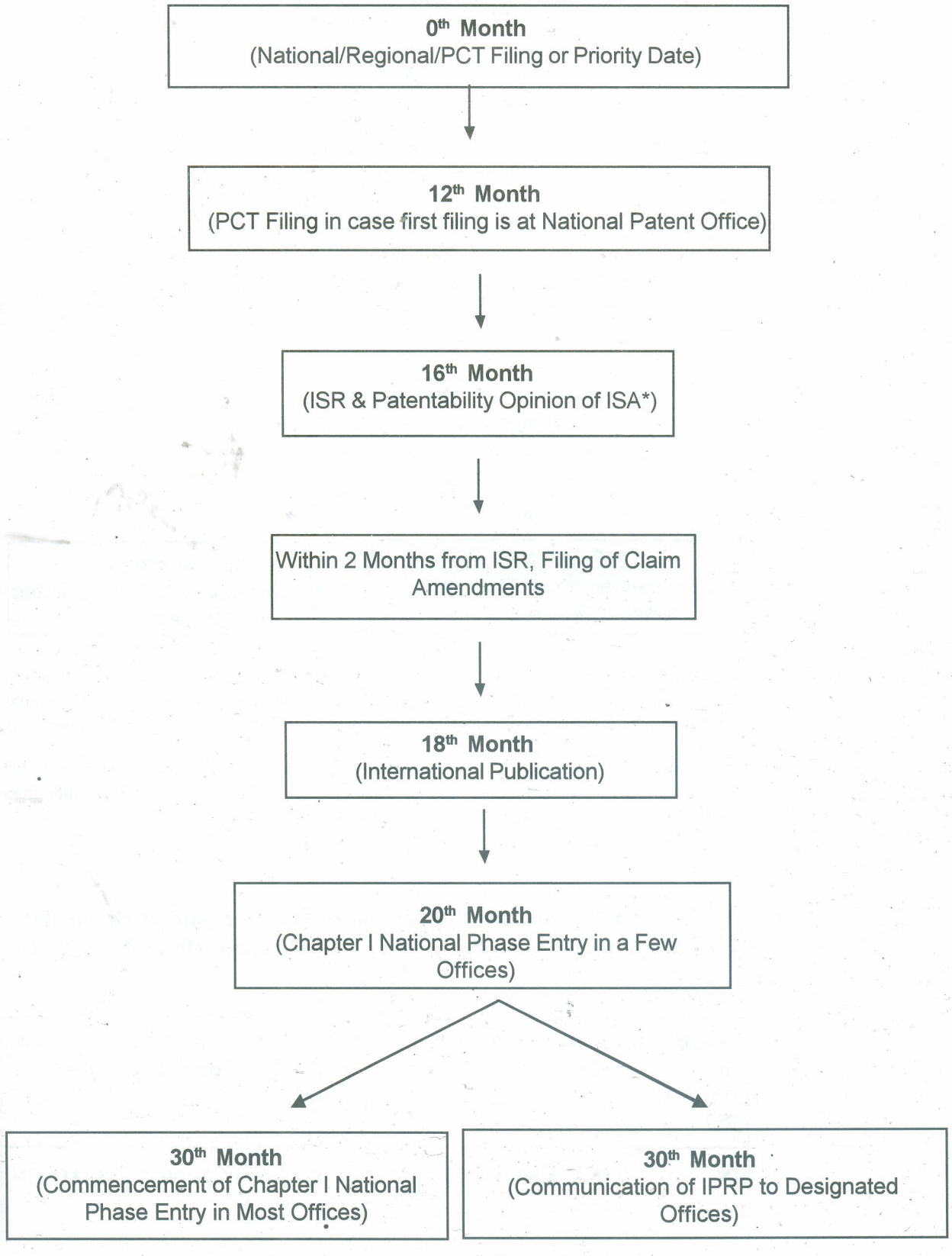

Record Copy to International Bureau
Search Copy to International search Authority
Home Copy to Receiving Office
Expiry of 14th month
International Bureau Sends file
Applicant
International search Authority
Receiving Office
Within 3 months from the receipt of Search Copy or 9 months from priority date whichever Time Limit expires later
ISA establishes the International Search report
Within 2 months from establishment of ISR, Informal Comments/Amendment of claims & Priority claims are filed at International Bureau or Receiving Office
International Search report with the Informal comments (if any) Communicated to
Applicant
International Bureau
Receiving Office

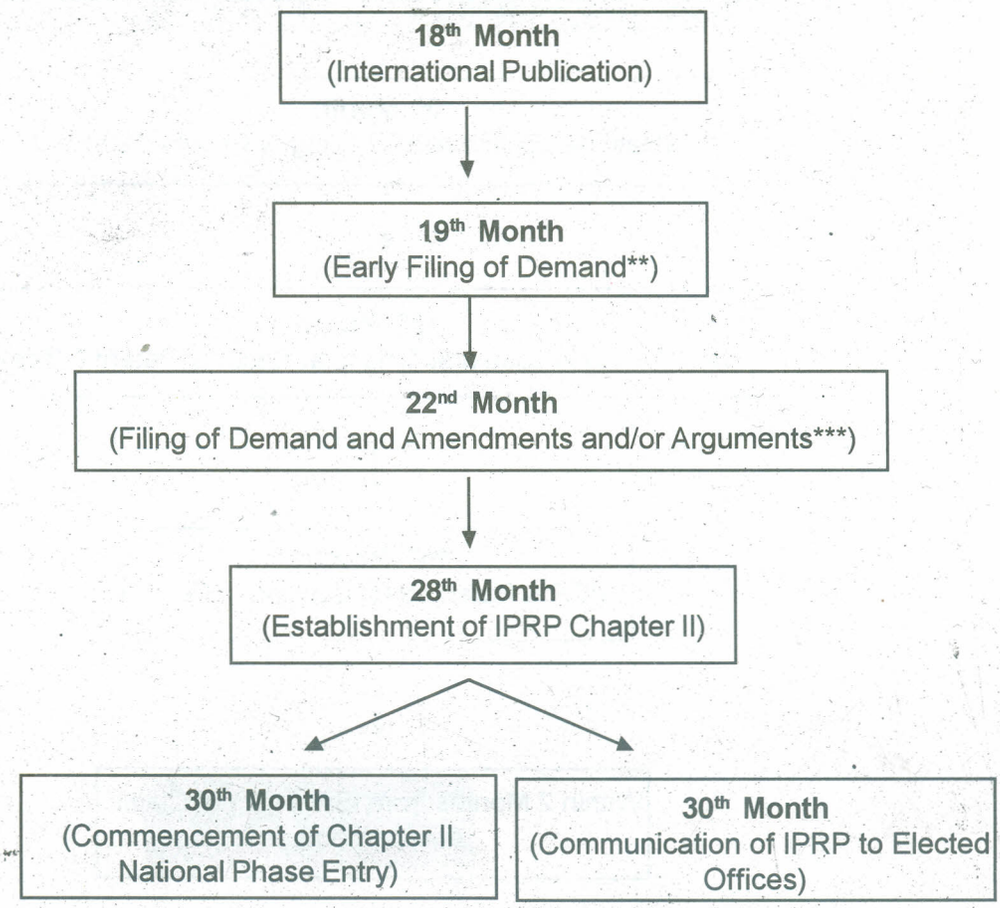

At 17.5th month
By Withdrawing the Entire Application
The Applicant has option to Stop Publication
By Withdrawing the Earliest Priority Claim
By Withdrawing All Designations EXCEPT the India
At 18th month
Publication of the Application
At 22nd month
Demand for International Preliminary Examination
At 28th month
IPER Issued
At 30th month
National Phase

1.1.1.1.1.1 GRANT of PATENT from National Patent Office



* In case PCT is First filing ISA establishes the ISR and Written Opinion before expiry of 9 Months from the date of Priority.

PCT Timeline : CHAPTER II



** In respect of a few States, the time limit of 30 months to enter national phase will, however, only apply if those States have been elected in a demand filed before the expiration of 19 months from the priority date (for an updated list of States concerned, see the PCT's Internet site)

*** A demand for international preliminary examination may be filed at any time prior to the expiration of 3 months from the date of transmittal of the ISR to WO, or 22 months from the priority date, whichever time limit expires later.

The List of PCT Fees, for Indian Applicants to be paid at Receiving Offices in India while applying for PCT applications (from 01/01/2011)

Transmittal and International filing fees#

(Amounts as on 01/01/2011) **RO**	**Transmittal fee**	**International filing fee**	**Fee per sheet over 30**	**PCT-EASY reduction**	**Competent ISA(s)**
IN	**INR 8,000 INR 2,000 (Filing by Individual)**	**USD 1367***	**USD 15***	**USD 103***	AT AU CN

Fees for preparing certified Priority Document and transmission to IB of WIPO Rs. 4000/- (For Individual Rs.1, 000/-).

International Search fees# (from 01/01/2011)

ISA	Search Fee(USD)
AT	2326****
AU	1837
CN	314
EP	2,443****
SE	2,443****
US	2,080

International Preliminary Examination fees* (from 01/01/2011)**

IPEA	Preliminary Examination Fee	Handling Fee*
AT	EUR 1675	EUR 150
AU	AUD 550** 780	AUD 213
CN	CNY 1,500	CNY eq CHF 200
EP	EUR 1,760	EUR 150
SE	SEK 5,000	SEK 1,390
US	USD 600** 750	USD 206

\# Payable to RO/IN [CHENNAI, DELHI, KOLKATA, MUMBAI as per applicable Jurisdiction].

* The fee is reduced by 90% where applicant or each applicant (where two or more applicants) is a natural person and is a national of and resident in India.

** This amount will be applicable when Search is done by the same ISA.

*** Payable to IPEA in the currency prescribed by it.

**** The fee is reduced by 75% where applicant or each applicant (where two or more applicants) is a natural person and is a national of and resident in India.

Note - For further information in respect PCT related matters, students are advised to visit WIPO Website at http://www.wipo.int/pct/en/

Source: www.patentoffice.nic.in

International Search fees# (from 01/01/2011)

ISA	Search Fee(USD)
AT	2326****
AU	1837
CN	314
EP	2,443****
SE	2,443****
US	2,080

International Preliminary Examination fees* (from 01/01/2011)**

IPEA	Preliminary Examination Fee	Handling Fee*
AT	EUR 1675	EUR 150
AU	AUD 550** 780	AUD 213
CN	CNY 1,500	CNY eq CHF 200
EP	EUR 1,760	EUR 150
SE	SEK 5,000	SEK 1,390
US	USD 600** 750	USD 206

\# Payable to RO/IN [CHENNAI, DELHI, KOLKATA, MUMBAI as per applicable Jurisdiction].

* The fee is reduced by 90% where applicant or each applicant (where two or more applicants) is a natural person and is a national of and resident in India.

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*** Payable to IPEA in the currency prescribed by it.

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Note - For further information in respect PCT related matters, students are advised to visit WIPO Website at http://www.wipo.int/pct/en/

Source: www.patentoffice.nic.in

13.16 BENEFITS OF USING PCT SYSTEM

Use of PCT route has enormous is advantageous for an applicant, for the patent Offices and for the general public in many ways :

i) applicant gets 30 /31 months to decide upon seeking protection in foreign countries, to appoint local patent agents in each foreign country, to prepare the necessary translations and to pay the national fees;

ii) the applicant is assured that, if the international application is in the form prescribed by the PCT, it cannot be rejected on formal grounds by any PCT Contracting State patent Office during the national phase processing of the application;

iii) the applicant can evaluate the chances of the patent being granted on the basis of the international search report and the written opinion, and decide whether to proceed further or not;

iv) the applicant has the possibility during the optional international preliminary examination to respond to examiners' objection and make suitable amendments in the patent specification to adduce a positive written opinion on the international application before processing by the various patent Offices during the national phase;

v) the repeated search and examination work of patent Offices can be considerably reduced or eliminated due to the readily available international search report, the written opinion and, where applicable, the international preliminary report on patentability that accompany the international application;

vi) since each international application is published together with an international search report, third parties are in a better position to formulate a well-founded opinion about the patentability potential of the claimed invention; and

vii) for an applicant, international publication brings the disclosure of an invention to the notice of the world, which can be an effective means of advertising and searching for potential licensees.

viii) PCT procedure also postpones and reduces the major costs associated with international patent protection.

13.17 SUMMARY

- About a million patents are filed globally every year for new products, processes, applications and uses. These act like patents are the tools in the hands of companies to enhance their market value. Large firms file patents worldwide in developed as well as emerging markets.

- The Patent Cooperation Treaty is an agreement for international cooperation in the field of patents. PCT is a special agreement under the Paris Convention open only to states, which are also party to the Paris Convention.

- PCT is an international filing system for patents providing the applicant an international filing date in all the designated countries and conferring the late entry (generally up to 30/31 months) to the national offices without affecting the priority date.

- An international Patent application can be filed with the national patent Office, or directly with WIPO if permitted by the national security provisions in the national law. Both of those Offices act as PCT "receiving Offices".

- PCT procedure consists of two phases, International (PCT) Application filing phase followed by National phase Entry of International Patent Application.

- PCT route is economical only if one is seeking the patent protection in a number of countries. Therefore, deciding upon the filing route is very crucial. It is also extremely useful and cost effective if the inventor/the applicant is not sure about the commercial potential of the Invention/Patent at initial stages

- For every international application filed on or after 1 January 2004, the ISA establishes in its international search report, a written opinion which is preliminary and non-binding opinion on the invention as to whether it meets the patentability criteria in light of the search report results or not and in respect of which claims.

- The procedure under the PCT has enormous advantages for an applicant, for the patent Offices and for the general public.

- PCT procedure also postpones and reduces the major costs associated with international patent protection through extending help in making patenting decisions.

13.18 TERMINAL QUESTIONS

1) Mention the procedure of PCT filing.

2) What are the benefits of using PCT system?

13.19 ANSWERS AND HINTS

Self Assessment Questions

1) PCT means Patent Cooperation Treaty. It is a sister treaty of the paris convention administered by WIPO.

   2 Nationals and residents of a contracting country are entitled to file international application for patent under PCT. It can be filed with the national patent offices, or directly with WIPO.

2) International patent applications can be filed in any of the language. Which is accepted by the receiving offices. If that language is not accepted by ISA, the applicant is required to submit a translations of

3) Strategy 1: One of the options for an applicant would be to file a provisional specification at the National Patent Office followed by an International application under PCT. This option gives the applicant more time upto one year to fine-tune the documents and improve upon the disclosure, as the case may be. It can be followed by filing of complete specification and a PCT filing within 12 months from date of provisional filing to secure the priority.

1) 1) Refer to Section 13.8

2) Refer to Section 13.8

2) Refer to Section 13.9

Terminal Questions

1) Refer Section 13.1

2) Refer Section 13.9

3) Refer Section 13.18

UNIT 14 TECHNOLOGY TRANSFER

Structure

14.1 INTRODUCTION

Technology transfer involves two components viz the transfer of knowledge and the transfer of intellectual property rights.

Identification of IPR component and its valuation

Identification of knowledge components and its value

Exchange of knowledge and technical knowhow related thereto

The knowledge component includes the exchange of information, research results and ideas, while the intellectual property component involves the transfer of a right to use that knowledge with consent of property owner.

14.2 OBJECTIVES

After reading this unit, you should be able to:

- explain the term technology transfer;
- describe the different technology transfer activities before signing of the license agreement;
- discuss the technology transfer activities after signing of the license agreement;
- analyze the relationship between IPR activity, technology transfer and commercialisation;
- explain the different partnership in technology transfer and development;
- discuss the different method of technology transfer;
- analyze the government control on technology transfer; and
- describe the reasons for the failure of a technology transfer at the commercialisation stage.

14.3 TECHNOLOGY TRANSFER ACTIVITIES

Let us first examine in some detail, the technology transfer activities before the signing of the patent license agreement.

14.3.1 Before Signing of the License Agreement

There are certain activities that need to be carried out by the scientist/ inventor/ technology supplier for the transfer process to commence, even before the signing of the license agreement. These activities relate to the protection of the know-how by filing of various types of relevant IPRs, particularly patents, preparation of confidential information, preparation of comprehensive know-how documents, preparation and handing over of samples of the materials or prototype to a prospective licensee for his testing and evaluation.

a) **Intellectual Property Protection**

The inventor must discuss with IPR expert as to what are the type of IPR's applicable for his innovative idea. Let us consider this aspect in some detail with a few examples.

Patents – for inventions

Designs – for shape & configuration

Trademarks/trade names

Copy rights for packing labels, booklets, work manuals etc.

- *Complex Technologies :* There are many technologies, which can be protected by not one, but several patents. For example over 45 process/ product patents protect the Polymer Lithium battery technology of Bell Core Laboratories of US. There are product patents for the materials of the cathode, process patents for manufacturing the cathode and anode, product patent for the electrolyte used - etc. Besides, they have a brand name on use

of the Bell Core name protected under the Trademark Act. The cost of protecting this world-class technology in over 100 countries was over US Dollars 1.5 million. Few Indian companies can afford such high costs for world wide patenting and building an IPR fortress around their invention. But the multinationals do it, and that is the bane of the researchers and the industry in the developing countries.

Self Assessment Question **(Spend 3 minutes)**

1) Explain intellectual property protection with examples.

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b) **Confidential Information**

The confidentiality status of the scientists or the organisation involved in the development of the technology is an important factor. How long has the scientist been in the R&D institution, is he likely to leave, go on deputation to a foreign R&D Institution, or join an industry? What is the track record of the institution in not allowing their scientists to leak the technology to others for consideration under the table or for getting a foreign assignment? Does the Institution have a confidentiality agreement with their scientists, which is enforceable, and which they have enforced in the past?

The industry is very particular about this aspect. A honest industry client would feel assured about the confidentiality aspect if he is called upon to sign a confidentiality agreement before the commencement of detailed discussions on the technology. It would give him confidence that the scientist has not disclosed, nor will he in future disclose, confidential information to any unauthorized party.

Once a prospective licensee has been identified, the scientist has not only to prepare all the information that is required to convince the industry prospective licensee, some of which would be confidential, but also to take measures to protect the disclosure of such confidential information. What are the different types of confidential agreements. To illustrate, some of them are listed below:

- Non disclosure agreement between the Licensor and the prospective Licensee
- Confidentiality Agreement between the R&D Institute and the scientist
- Confidentiality Agreement between the Licensee and his employees
- Confidentiality agreement between the Licensee and his sub contractors
- Material/Prototype Transfer Agreement.

The IPR instruments, particularly patents, are designed, to hide as much information as is possible (a lot of information is necessary to grant a patent in Europe but not in the US), so that the technology cannot be stolen, replicated, or reworked, or reverse engineered by others. This is termed as the Know-how confidential

information, for it provides the safe guards, and increases the costs involved when a party tries to illegally copy the technology. The scientist has, therefore, to try and in-built confidentiality safeguards in the technology, such as, code locks for the anti - logarithms based programs in the computer software know-how or undisclosed catalysts in a new chemical processes, or undisclosed enzymes in the biotechnology/ pharmaceutical technologies. Often even individual inventors, provide hidden technical features even in utility and mechanical based products that are not disclosed in the patent documents but are crucial for the successful functioning and commercialisation of the technology. What is more, the patent document contains only the broad process parameters under which the process would work, not the exact parameters at which it gives the best results. This is also confidential information.

Often, the discussions begin with a prospective licensee much before the patent is granted (it normally takes 2 to 3 years for grant of a patent in US after it is filed; in India it may take almost 4 to 5 years). During this intervening period, the information contained in the patent application has also to be treated as confidential information, because a potential licensee could use the information in the patent application to file his own patent with some minor modifications and claim the rights to the invention

It is, therefore in the interest of the scientist to sign a confidentiality- cum non disclosure agreement with a prospective licensee before disclosing any confidential information.

A party, who is interested in the technology, would first of all like to have, a detailed presentation on all the technical aspects of the technology. How does one convey or demonstrate the technical superiority of a technology vis-à-vis an existing [or another new technology] to a prospective industry client, without disclosing information, which may be confidential (and therefore valuable). It may be noted that all scientists (and patent attorney's) try to give the minimum information, in the patent documents. Further, they try to ensure that the key process parameters (viz, temperature, pressure, time of reaction etc) are specified to cover the widest range possible in the patent documents. For it is well known that the patents that cover the widest range of parameters vis-à-vis details of use of alternative raw materials, number of chemical reactions involved, types of catalysts / enzymes used in the reactions, have a much higher value as compared to "narrow" patents which are easy to obtain but difficult to defend when other parties infringe the patent by slightly changing the process parameters..

In comparison to the patent document, the Know How document has to specify the process parameters within the narrowest range so as to have the most efficient process in terms of yield, quality and quality (purity). An intelligent Licensor tries to keep this information confidential, so that it is passed on only to legal licensees and that too only after signing of the license agreement, Thereby protecting the technology from being exploited by unauthorized parties.

A prospective licensee often insists on a technical comparison with other technologies (some times with the one he is already using). But the information on other technologies is often proprietary, and difficult to obtain. The first step therefore for the scientist is to conduct an international patent search. It is now possible to carry out structured international patent searches through Internet search engines such as Devernet (you have to pay for it - Rs. 5,000 for about 15-20 minutes search). Yes, publications can also provide valuable information for making a

technical comparison. But it is very important to ensure that while presenting, orally or through written documents, the technical comparison to a prospective licensee [while some facts have to be disclosed], one has to hide critical and crucial information relating to the names of the actual raw materials used in the process or the processing parameters such as temperature, pressure time of reaction, etc. Let us examine as to how a scientist can make a technical comparison to a prospective client without disclosing confidential information through a specific example.

Vitamin B6 is an important food supplement for post surgery patients and aged persons. The Indian market for vitamin B6 is estimated at Rs. 3000 million. There are only two players in the market, IDPL, a public sector company using an Old Russian technology, and a multinational, which is basically marketing the product of its parent company. An R&D institution such as the Indian Institute of Technology [IICT] develops a more efficient and lower cost patented [process patent] technology for manufacture of vitamin B6, and IDPL wishes to acquire this new technology. They ask several questions, what are the raw materials, how many chemical reaction steps are involved in the new process, what is the cost of the raw materials, what are the savings on energy or use of other utilities, etc. The scientist has to ensure that he provides information sufficient to not only entice but also to convince the client about the advantages of the technology. At the same time he has to withhold information on what are the actual raw materials, catalysts or enzymes. For example the discussion starts of with the following questions.

- The Scientist:" We have explained the benefits of our technology; it is cost effective & yields a better purity product. Why do you want to know the names of the raw materials"?
- The Client: "We want a techno - commercial evaluation of the technology. For which we need to know not only the names of the raw materials but also the consumption level of each of these raw materials. If you do not disclose the names of the raw materials, how can we calculate the cost of production? After all, you know that we are already manufacturing vitamin B6. We would be interested in taking your new process only if it is more cost effective than our existing process".
- The Scientist: "You don't need to know the names of the raw materials. I have identified these raw materials as A, B, C, D etc and have also indicated the consumption level of each per Kg of the end product, and also the prices at which these raw materials are available on normal commercial terms, Further, I can also confirm that all these raw materials are available locally, except one catalyst which is imported".

Please note how the matter has been handled to the satisfaction of both the parties.

c) **Frequently Asked Questions relating to the Know-how**

One must realize that any intelligent buyer of a technology is going to ask a number of questions particularly, regarding the stage of development of the technology. The scientist should be prepared to answer the same in a business like manner without compromising his position, in respect of the disclosure of confidential information not withstanding the fact that the prospective licensee has already signed the confidentiality agreement. The Vitamin example

was only an illustration of how to respond. We give below some of the Frequently Asked Questions (FAQ's).

Raw material based questions

- Which are the main raw materials.
- Does the process take into account the variations in the quality of the raw materials (particularly for agro-food, metallurgical, herbal drugs, building material based technologies)
- Are the raw materials commercially and abundantly available throughout the year and nar the place where the manufacturing plant is to be located?
- Has the scientist used lab grade quality or commercial grade quality materials in his pilot process trails? If he has used lab grade materials of high quality, the process may not work in the commercial plant where a licensee normally would use commercial grade raw materials due to the high cost of lab grade materials
- Are there any monopoly suppliers involved in the supply of the raw materials, who could at a later stage dictate the prices and make the process commercially unviable?
- What is the shelf life of the raw materials (particularly for perishables).
- What are the minimum order quantities?
- Are there any problems in the collection of the raw material, for instance waste PET bottles [There is a new technology which has been developed by BITRA for the production of value added products such as non-woven carpets from waste PET bottles, but the problem is how to collect these bottles which are bulky and of low value to the waste collectors commonly known as Raddiwallas].
- Are there any dangers in the transportation or storage of the raw materials (for example explosives, gases, toxic chemicals etc.)?
- Are there any restrictions in transportation [refrigerated] or in the usage of these raw materials?

Process based questions

- How many reaction steps are involved in the process?.
- What are the most optimal process parameters? Have the boundary process conditions been studied (in which the process will work). This type of information is required by the detailed design and engineering consultans and the fabricators of custom designed equipment such as reactors, etc.
- Does the process use any catalyst? If so, what is the life of the catalyst?
- At what scale has the process been developed and tried - lab scale, pilot plant scale, semi commercial scale or commercial scale?
- Whether the process is batch type or continuous?
- To what extent automation is possible?

- What is the start up/shut down time?
- Whether any special precautions are needed for start up or shut down? [Sequence of shutdown/startup]
- Would the process require any custom made plant and machinery? If so, who will fabricate such equipment?

End Product related questions

- What are the advantages/disadvantages of the new product over existing products?
- What are the different possible applications? (for example NASA developed heat resistance Teflon coated electrical cables for use in space ships, but now Teflon is used for Teflon coated non stick pans and Teflon coated leather products)
- What is the shelf life of the products? Under what conditions?
- Whether any specialised packing is required (hermetically sealed containers, shatter proof packing, poly packs, etc) for transportation or storage of the products?
- How many ranges or models of the product have been developed?
- Has the product been tested by an independent Laboratory or R&D Institution?
- Does the end product require mandatory certification such as the approval of the FDA, Drug controller, Pesticides / Fertilizer control Board, Department of Biotechnology (for genetically modified products), etc? Has such certification been obtained?
- Are there any religious or ethical issues involved in the sale or use of the product such as cow fat used in greases as a lubricant, which led to the Indian mutiny against the British in 1857?
- Does the product conform to the stipulated standards, BIS, ISO etc?

Pollution related questions

- What are the types of polluting wastes generated in the process? Have any measures been taken to treat or utilize the same to produce value added by products?
- Can the effluents/wastes be sold to other industries? Sometimes the waste of one industry is the raw material for another industry. [For example in the Philippines there is a Effluent /Waste Materials Exchange Organisation which facilitates exchange of waste between various organisations). It actually runs its operations on a stand-alone commercial basis and makes profits. There is a need to introduce this concept in India. The Gujarat Government has taken a lead in this matter by establishing Common Effluent Treatment facilities in their various industrial Estates.

Utility related questions

- What are the utilities required in terms of uninterrupted power supply, water of a particular quality, gases, etc.

- Any special building finishes required for the walls or floors or humidity control requirement, such as clean rooms.
- What are the safety requirements for the plant and for the operating manpower (masks, gloves etc)?

These are only some of the questions. In practice, depending on the technology there could be many more questions. Basically the Buyer wants to make a technology completeness assessment before signing the license agreement.

d) **Technology Completeness**

This relates to two aspects: viz one relating to technology completeness and the other relating to technology information/document completeness. Both are equally important.

i) **Technology Completeness**

The first aspect relates to whether process optimization has been carried out. (For instance a process works at 150°C at a pressure of 3 ATM in the laboratory, but are these optimum parameters. Would the cost or time of processing be lower at 145°C and at a pressure of 3.5 ATM ? Further, a technical consultant for a process plant say zeolite 'A' an environment friendly detergent, would require the design boundary conditions for the process at a commercial scale level because in the lab, or at pilot scale, the boundary conditions of temperature, pressure, reaction time can be accurately controlled, but in a reactor i.e. 30 times the size of the pilot plant, the temperature near the walls of the reactor may be 150°C, (because the heating system is in the periphery) but the temperature in the center of the reactor may be 140°C. Therefore, the detailed design consultant for the reactor would require a broader range of the parameter specifications at which the process would still be operative, say in the temperature boundary condition of 140°-150°C. If he does not get this information, either he may be forced into designing a very costly reactor which can maintain a temperature of 150°+ 1°C or he may end up in to designing a reactor where the temperature varies from 150° C at the walls to 140°C at the center which may result in the failure of the process. The scientist should, therefore, be prepared to provide such information at least at the demonstration stage. Though, the client may insist in getting this information at the material transfer stage because he would like to validate the working of the process with the wide ranging parameters in his own laboratory.

It may be noted that as per international norms a nominal fees of around 5 to 10% of the estimated lump sum premium is charged as a non returnable fees at the time of signing of the Confidential Information / Material Transfer Agreement. The justification for charging such a fees lies in the fact that providing access to confidential information and the new material by itself amounts to transfer, though partially, of the know-how; from which the client will gain some knowledge, even if he later opts to not to take a license for the know-how.

ii) **Know-how Manual Completeness**

This is also an important factor, particularly in the Indian scientific prevailing environment: the scientist does not want to document his know how and

knowledge relating to his invention to the fullest extent, for he feels that could result in loosing his importance. He may also have covert reasons such as charging additional consultancy fees above or under the board fees for providing information on the missing links in the technology but only after a licensee has found it impossible to replicate the invention in his industry. This results in a lot of ill will between the R&D Institute and the client who feels cheated.

The best way for an industry client to examine the completeness of a know how document is to ask, say 50 relevant questions, (the FAQs serve as a guideline), pertaining to the know-how and if for 90% of these questions, replies are given in the know document, it is reasonably complete. The client should insist upon the scientist to show to him the relevant pages where the replies or explanations are given .He should not accept a verbal reply.

iii) **Laboratory notebook**

The importance of maintaining a Laboratory Notebook needs to be highlighted not only in the context of preparation of the know-how document but also in respect of the IPR issues.

For instance in the USA, the patent is granted to a person on the basis of 'First to invent' and not to the person on the basis of 'First to file.' In almost all other countries including India the patent law stipulates that the patent shall be granted to the person who first files the patent application. The Lab notebook, provided it is maintained properly, is an important document to prove as to who was the first to invent the product or the process. In fact this has become big business in the US with the concept that someone may have done some work on the invention, somewhere in the world prior to the filing of the patent This is particularly true for new chemical entities, which are based on traditional knowledge of medicinal plants of the tribes, who have acquired the knowledge over centuries, based on the information passed on to them from one generation to another. A few e-organisations have been setup to assist companies in proving the claims of a patent to be invalid, on the grounds that the knowledge contained in the patent document was either published before the filing of the patent application or the information contained in the document was in the public domain. This is sometimes difficult to prove, as traditional knowledge particularly relating to herbal medicines is not so well documented. Patentbust.com is one such Internet site. There are reports that over 30 scientists have claimed and won awards of over US 1 million dollars by busting patents on the basis that the Patent information was in the public domain, or that someone, somewhere had carried out similar work before the patent was filed in the US.

The Patentbust.com site invites scientists to provide information [with the Lab Note book as the proof] pertaining to the work of an invention prior to the filing of the patent in US. This is, particularly important for the scientists in the developing countries like India who have often carried out similar R&D work much earlier to the date of the filing of the patent, but have not filed any patents on it, for lack of financial resources. The scientists from the developing countries can utilize the services of such Internet sites or similar organisations to make money by what they call 'bursting a patent' provided they have maintained a Laboratory Notebook as per the stipulated norms. This aspect is discussed in more detail in Module No 14 "Management of Intellectual Property Rights".

14.3.2 After Signing of the License Agreement

The technology transfer activities after signing of the license agreement relate to:

- Demonstration of know how at lab/bench/or pilot scale
- Providing information for detailed design and engineering of the plant by the Licensee or to his consultant.
- Transfer of Prototype/Samples
- Training of Licensee's personnel in the premises of the Licensor.
- Providing assistance for obtaining certification of the product from statutory regulatory organisations.
- Arranging partnerships with consultants, market survey agencies, Technology Development Funding Agencies
- Identifying competent equipment suppliers, fabricators, contractors, etc.
- Supervision of erection, testing and commissioning of the manufacturing plant
- Debottlenecking of commissioning problems, optimization of process parameters, providing assistance for developing technology for converting waste products into by products generated in the plant
- Minimizing pollution/effluents.
- Deputation of the scientist or other key personnel to the Licensee's plant for short/long-term/permanent employment
- Testing of the end products (and sometimes the raw materials used in the process), manufactured in the commercial plant.
- Obtaining feed back on the success / failure of the Licensee in commercializing the technology
- Providing assistance for improvement of the technology
- Providing assistance in obtaining add on patents to protect the technology
- Collection of royalties
- Providing technical assistance to the lawyers in case of legal action against the licensee for non payment of royalty dues or in case of legal action against parties who are infringing the patented know-how or for defending his own IPR rights

It may be noted that the above-mentioned activities may not be sequential. Further, not all activities may be required. It depends on the technical capability of the Licensee and on the nature of the technology. There can also be a number of pitfalls in the performance of these activities.

14.4 DYNAMIC RELATIONSHIP BETWEEN IPR ACTIVITY, TECHNOLOGY TRANSFER AND COMMERCIALISATION

It has earlier been mentioned that many of the activities related to technology transfer are not stand alone activities, neither are they sequential. There is a dynamic relationship between them and, often the progress in one activity decides whether to proceed with the other activity. This relationship is shown in Figure

14.1. It may be observed that while the R&D development proceeds continuously at an increasing pace, the IPR activity has distinct time stages. The first time bound decision stage comes at the end of 12 months of filing the provisional patent application, when one has to decide whether to file a PCT application or not, otherwise the scientist would lose the priority. The scientist has also to file the final specifications of the patent.

The next stage comes after another 18 months, when the International patent examination is to be carried out by WIPO, to determine prime facie whether a patent is likely to be granted for the invention. The next stage comes after another 12 months when one has to decide in which countries the patent has to be filed. There is no world patent. One has to file patent in each of the countries where protection is required at enormous cost. In case the R&D activity is not preceding satisfactorily all further activity is to be aborted.

DYNAMIC RELATIONSHIP BETWEEN IPR ACTIVITY AND COMMERCIALISATION

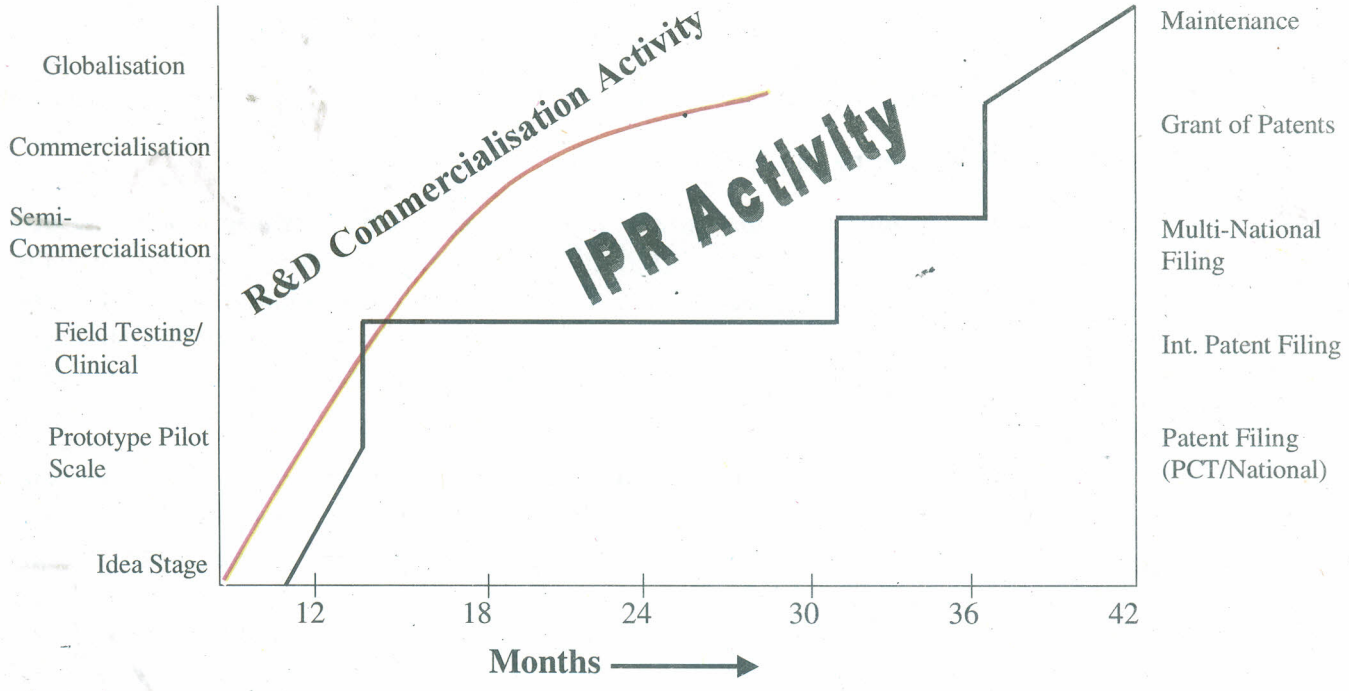

Figure 14.1

14.5 PARTNERSHIPS IN TECHNOLOGY TRANSFER AND DEVELOPMENT

The process of Technology Transfer and further development cannot be achieved without the aid of partners. These partners help in various stage of commercialization of the technology.

Significance of partnerships

- Minimizing the cost of carrying out the R&D work – taking advantage of the salary structure in the developing nations

- Need to club together various types of expertise and skills to develop a saleable product. – Issue of specialization,
- Need for accessing and collecting latest information on the innovation – reinventing of wheel should not be done
- Location advantages of partners – user testing
- Need for involvement of group of experts – brainstorming sessions throws new light on the subject/problems/issues

How to forge partnerships - STEPS

- Discovering the interests of the various partners and identification of a Lead partner
- Stating those interests in order of merit
- Qualifying these interests in terms of money values, additional skills that may be acquired from the partner through the partnership like Surveys, Financial Assistance, Detailed Design and Engineering Services, Clinical/ Field Trials, etc.
- Creating options that meet the interests of the various partners
- Resolving conflict situations

Who can be the Partners

- **Innovators** – Idea generators – persons, scientists, engineers, other research institutes, marketers, users etc who generate new ideas or conceptualize the usage of a particular innovation for entirely new applications. Shop-floor workers, who introduce incremental innovations for cost optimization, are also included in this category. This type of partner comes in at the idea generation stage
- **Engineering organisation** – The role of the engineering organisations is to prepare the detailed process flow diagrams, designs of the process equipment/ prototypes, plant layouts, designs of the utilities (power, water, steam, compressed air, pollution control systems and building designs etc.). Hence the partnership with an Engineering Organisation comes at the stage of preparation of designs for setting up an up scaled manufacturing plant (techno-commercially viable).
- **Equipment Prototypes fabricators and suppliers of plant and machinery** – In the case of a new process, often customized manufacturing equipment such as reactors, machining centers etc. are required to be developed for which partnerships with specialised fabrication agencies rather than established production industries are more successful. These specialised agencies fabricate equipments/prototypes in accordance with the detailed designs prepared by the Engineering Consultant and under their supervision. It must be noted that the expertise required in fabricating such equipment or the infrastructure required for making them is of an entirely different nature, which the scientists may not have in his Institution.
- **Certification/testing agencies** – If a new product emerges, it has to be tested by an independent agency for its quality, reliability and application

before an industry can be convinced to take up its production. In the area of drugs and pharmaceuticals, the certification procedure involves prolonged field trials, clinical trials, etc. For the product to be internationally accepted, such certification has to be carried out by International Certifying Agencies. However the cost of conducting such tests/procedures run in hundreds of thousands of dollars and there could be unforeseen losses since the product could be rejected during the trials. A common way to finance such tests is to interest a foreign company or a foreign Venture Capitalists to finance such costs in a quid pro arrangement by making them joint owners of the know-how. Also many times the testing may not be allowed to be conducted in the R&D Institute due to government regulation/ or lack of expensive infrastructure (specially in the case of Animal Trials where the certification can be carried out only by specifically authorized institutions).

- **User Testing Agencies** – This is especially applicable in case of Drugs undergoing human trials (selection of hospitals, patients etc). In such cases the hospitals may have to be involved in the partnership. Another example could be in the area of new developments in the area of effluent treatment plants; this will have to be tested out in commercial plants.

- **Organisations for protecting Intellectual Property Rights** – Besides organisation like NRDC and Patent Facilitation Cell of the DSIR (who can provide both technical and financial assistance in IPR protection); there are a number of patent attorneys who can provide these services on the basis of sharing the revenues from licensing of the technology.

- **Technology Funding Agencies** – for details on this please refer to the Technology Development Funding option available on the ST web site.

- **Market Survey Agencies** – they provide the data of the market potential and who can be the licensees

- **Licensee/Sub-Licensee** – The role of the licensee in developing new applications or an improved version of the technology is well recognized. However, what is rarely practiced is to make the licensee a formal partner in the new developments, which would motivate him to develop new applications, by making him a part owner of the new technology.

- **Government** – The role of government in establishing safety standards for vehicles, electric appliances, high rise buildings (fire safety), environmental concerns, waste disposal/processing etc is sometimes instrumental, if not essential in successful introduction of new technologies by enacting new laws, notifying new Technical Barriers to Trade (TBTs), etc. For example, the new catalytic converters developed by a number of Indian / foreign R&D institutions for reducing NOX/SOX from the exhaust of vehicles would never have been commercially successful if the Supreme Court in India had not stipulated that after 2000, no new cars would be allowed to be sold in Delhi if they were not fitted with catalytic converters.

- **Technology Transfer Organisations** – The role of the Technology Transfer Organisation covers all the activities, which are required in taking an invention from a laboratory to the market place; and therefore they are the ideal partners, particularly for an R&D Institution that does not have expertise in marketing of the technology. The role of the technology transfer organisation is:

i) Technology evaluation

ii) Bringing Together all the above mentioned partners

iii) Providing IPR search data

iv) IPR protection

v) Conducting Market Surveys

vi) Preparation of feasibility/project reports

vii) Data dissemination through National/International Databases

viii) Identifying competent industry clients

ix) Negotiating fair and equitable technology transfer agreements

x) Collection of royalties

xi) Export of Technology

The important technology transfer organisations in India are: – NRDC, ANTRIX, BCIL, FITT, APCTT, IITIAN, WISTA

- **Other Type of Partnerships**

Partnership in promoting Rural Technologies – In this case the partnership has to be sought by the R&D Institution who developed the invention, firstly with Govt. agencies such as NABARD, KVIC, Institute of Rural Development, Hydrabad, etc who would help in demonstration of the invention in their centers and in exhibitions, which is followed by propagation of the invention by NGOs. The NGOs disseminate the information through out the country and also advise the rural people as to where and how they can acquire the know-how, training and equipment. The final step is the marketing of the equipment or gadget on a commercial basis, which is left to the market forces. Typical examples are the ratchet pulley wheel used for drawing water in deep wells (the ratchet prevents the bucket of water slipping back into the well), which is very useful in places like Rajasthan where the water table is almost 84 meters below the surface and Kitinal, a simple device developed to facilitate planting of seeds.

Compulsory partnerships (Cross-Licensing) – This type partnership is basically for innovators where innovations are related to one another. The basic need for such partnerships arises in case of blocking patents. For Example, a new type of wick is developed by one person and a new type wax for the candle is developed by another person. Either of them cannot produce the new candle incorporating the two inventions, they need to cross license their respective patented know-how to the other party and then both parties can produce the new candle.

Raw Material Collector as a Partner – This is required in scenarios where the raw material is available as a waste throughout the land and waste and scrap collectors are needed to collect that material. It could be for PET recycling, hospitals, hotels, household wastes and setting up common effluent facilities for chemical industries etc. Successful example of such a partnership is collections of orange and lemon peels from fruit juice vendors for processing and producing highly valued "Pectin" for the Pharmaceutical Industry.

International Partnerships – These partnerships are useful when the product development is very costly and cannot be done by individual institutions. There

might be other reasons also for this like country laws in that area being less stringent (example FDA approval compared to DGCI approval). A number of major innovations have emerged where the basic innovation has been done in India and the further development to produce a complete product has been done by a multi-national industry or an international R&D institute.

Partnership between an established industry and the customer for Information feedback and Innovation – The feedback of information from the ultimate consumer in respect of both consumer durable and non-durable products often provides critical inputs and suggestions for improvements through product innovation.

14.6 METHODS OF TECHNOLOGY TRANSFER

Simple Technologies: Know-how manual based transfer

This Transfer Arrangement is the normal arrangement where the Technology supplier provides a know-how manual and training for the technology to the Technology receiver. This arrangement is generally followed where the technology is simple and easy to comprehend.

Transfer of rural and appropriate technologies to the masses

Taking technologies and propagating and disseminating them in the rural areas is perhaps one of the most difficult tasks in our country. In this area, the most successful partnership concept that has evolved is akin to the Lap race in which the first runner of the 400 meters lap race passes on the baton to the 2nd runner after the 100 meters (First lap) and so on till the full race of 400 meters is completed.

This is depicted in the following diagram.

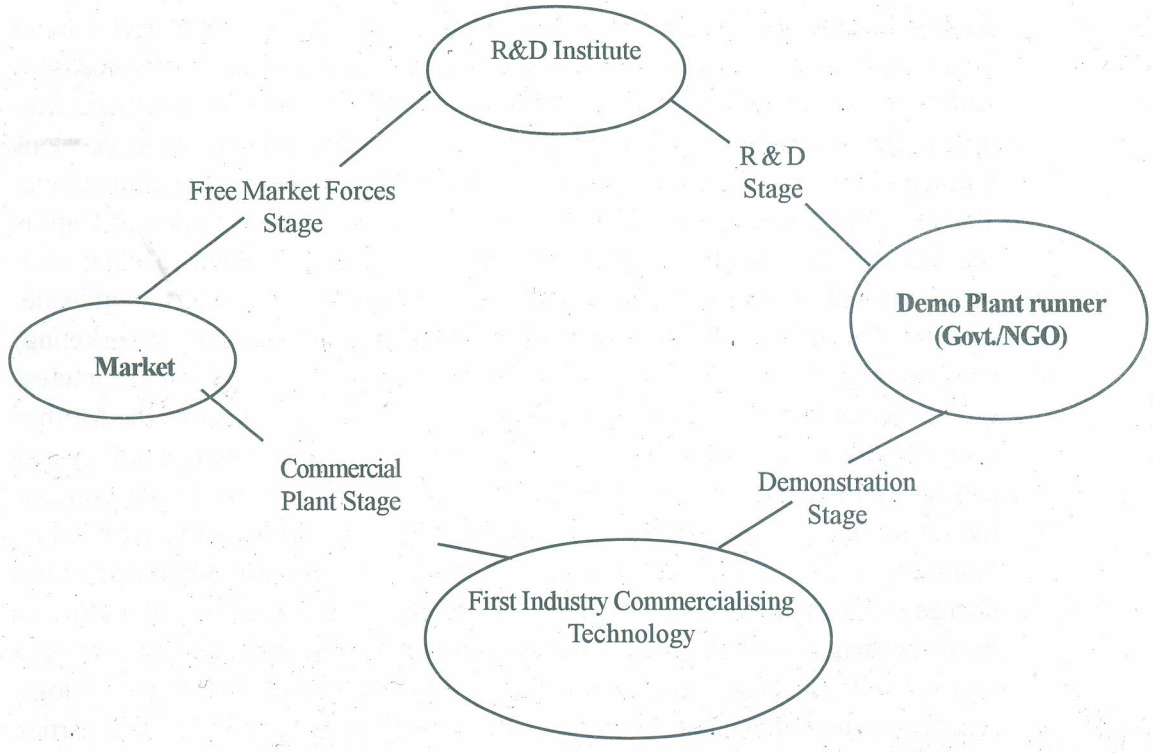

Figure: 14.2

Typically the first segment of the race is run by the R&D institute (the innovator to develop simple innovative technologies such as Leaf Cup Making machine, Papad Making Machine, Chlorine Tablets, Hand Pumps, Improved Chullahs, Solar Cookers, Solar Candle Making deices etc. The second lap is completed by the concerned Government agencies such as Khadi Village and Industrial Corporation (KVIC), NRDC, National Small Industries Corporation (NSIC) who fabricate 50-100 prototypes which are then demonstrated in the rural areas through the rural technology-cum-demonstration centers of NRDC, agricultural colleges, polytechnics centers or in rural trade fairs, exhibitions etc. Some of these centers also provide training to the rural people in the manufacturing and operation of these simple devices. The third lap is usually covered by the Non-Government Organisations (NGOs) who disseminate the information through out the country and also advise the rural people as to where and how they can acquire the know-how, training and equipment. The last lap is really left to the market forces and is normally very successful after the industry succeeds in marketing the equipment/ gadgets on a commercial basis. In this last stage, hardly any training is needed as the technology has by then become popular and rural people have already seen the device in operation in a nearby place and they are, therefore, willing to buy it on a commercial basis. A typical example is that of the Leaf Cup Making Machine costing around Rs. 10,000, which was developed by the Central Food Technological Research Institute (CFTRI), Mysore. Initially about 20 prototypes were fabricated, and demonstrated by NRDC in their RTDT centers, the Trade Fair Centre at Pragati Maidan etc. Now there are over a dozen fabricators and suppliers of the machine and over 10,000-leaf cup making machines have been sold on a commercial basis all over India. In fact, in Bihar and Madhya Pradesh the food in almost every marriage function is served in leaf cup plates, which have replaced the traditional 'pattals'.

Technology transfer through a Mother Licensee

The Mother Licensee technology transfer arrangement works on the principle that the first Licensee (promoter who sets up the first project based on the technology) becomes a partner in the technology transfer process to all the future licensees and he thus becomes "The Mother Licensee". It is the Mother Licensee who upscale the process, improves the product through incremental innovation, develops a range of models of different capacities depending on the market demand etc. The most important aspect of the technology transfer process in this concept is the fact that the Mother Licensee can provide a proven - Plant to Plant - i.e. commercial plant scale technology to all the future prospective clients, worldwide. In short, the onus of all future technology transfer activities such as marketing, sub-licensing of the technology, (It is a debatable point, whether it is in the interest of the Licensor to give the sub-licensing rights of the technology to the Mother Licensee).The Mother Licensee is the best person to market the technology and can set up the projects of the future licensees on turnkey basis. In this concept the future licensees do not have to face the problems which a party faces when commercialising a lab scale technology. The Mother Licensee, off course would charge extra payment for his services, which could be in the form of a share in the ownership of the technology, or getting substantial consultancy fees for providing various services, which are a part of the turnkey contract. In this technology transfer mechanism multiple licensing of the technology is possible to other parties quickly, without risks and in a cost effective manner with minimal role of the original inventors who can utilize their time to develop other technologies This concept is particularly suitable for technologies, suitable for small and medium

scale industries where many plants can come up through multiple licensing and be established near the source raw materials. For export of technologies this is the best method.

Let us examine this concept of a successful example: The know-how for manufacture of "Rice Husk Particle Board" was developed by the Indian Plywood Research Institute (IPRI) Ban galore. The lab process was developed for making plain rice husk boards of 4'x 4' size in the small pilot plant in the lab. After the process was assigned to NRDC, The NRDC entered into a mother partnership arrangement with M/s Padmavathy Panel Board Ltd. (PPBL) (new company formed for the project) for up scaling the process, improving the quality of the product and developing a wide range of Rice Husk Particle Boards laminated with wood veneer, bamboo mat, jute cloth paper etc. Subsequently, the project was successfully completed and the commercial production was well received in the market. The fully proven upgraded commercial plant scale technology was licensed to 5 other companies in India, one company in Malaysia and to another company in Indonesia. The Padmavathy Panel Board Ltd. (PPBL) provided the complete process know-how, detailed engineering, supply of plant and machinery, supervision of erection, testing and commissioning services, including training of the client's personnel in the Mother Plant as well as at site subsequent licensee's plants. The technology fees earned from licensing the technology to other parties was shared amongst all the concerned partners i.e. the Mother Licensee, (PPBL), the technology transfer agency (NRDC) & the Research Institute (IPRI).

It may be noted that one of the essential features of the Mother Licensee Technology Transfer Partnership concept is the provision of training of the clients' personnel in the mother plant. This concept is also particularly suited where the process parameters have to be again optimized depending on the specifications of the raw materials (which may vary from one place to another). Thus, this concept can be successfully applied to other technologies such as Mini Cement Plants, Food Processing Plants, Agro Processing Plants, and Extraction of Herbal Drugs etc.

The concept can also be further extended to partnerships with Consultants particularly in cases where training of clients' personnel in an operating plant is not a pre-requisite for the success of the technology. In such cases, the consultant becomes the Mother Licensee and provides the process know-how and detailed engineering and services fabrication, supervision of erection, testing and commission of the plant and supply of machinery and if required, training of operators on the plant itself.

Technology transfer through cross licensing

Compulsory technology transfer arrangements in the legal jargon are also known as "Cross-Licensing". The basic need of compulsory partnership arises, for example in the case of blocking patents. Company A makes a new type of low cost non smoking wax, while Company B patents a new type of wick which is useful for that type of wax, but neither can make a new candle without a license from the other: cross licensing to one another is the only way out. Another example is a capacitor based technology that would prevent the driver of a vehicle to use his mobile phone while he is seated on the drivers seat due to the capacitance of his body with the capacitance of the seat which transmits a signal to block the usage of the mobile phone. Such a device requires patented sensors to be installed in the car and modifications in the integrated circuits of the mobile phone.

One major problem in cross-licensing partnerships is that sometimes such partnerships create monopolies, which may be against anti-trust laws of a country. Cross licensing partnerships may therefore be sometimes illegal. Japanese companies have been the most successful in the use of this type of restrictive mechanism of technology transfer. Cross licensing is the new global mantra in the telecommunication and embedded electronics product areas. The negotiations for mergers and acquisition of one company by another often hinges on the concept of cross licensing of patents.

Technology transfer by On Line auction of patents through Internet

In the developed countries where venture capitalists for new technologies are yet to make an impact, sometimes the best option is to auction the patent on line. This option of technology transfer is aptly suited to the individual inventor who has limited resources for protecting his invention worldwide or to commercialize it. There are a number of Internet sites which provide services for auction / technology transfer of patents on line, on cost sharing basis (or on fixed charges for a specific period for hosting the information on the patent on their website). Some of these organisations provide services for a specific sector, such as the Parma Sector. A list of the more prominent ones is given below:

- Patent Auction.com
- First to Patent.com
- Absurd Patents.com
- Patent Burst.com
- Patent Index.com

Transfer of technology through sale of machinery with embedded technology

Incorporating the technology in the hardware is one pf the best methods to protect new technology, particularly in the computer software area and telecommunication products, and in the case of custom made CNC machining centers. In such cases, the technology transfer process is carried out in two steps. The full details of the Know-how are transferred to a company who manufactures the machinery with the embedded technology, and the company transfers the skills for production of the end products to its clients through the use of the custom made manufacturing equipment.

Franchising and Distributorship

Commercial transfer of technology may also take place in connection with the system of the franchising or distributorship of goods and services. A franchise or distributorship is a business arrangement whereby the reputation, technical information and expertise of one party are combined with the investment of another party for the purpose of selling goods or rendering services directly to the consumer.

The goods in question may be durable, as in the case of automobiles or home appliances. They may be consumable in use, as, for example, prepared food or beverages. The services may extend to the rental of capital equipment, for example, automobiles, trucks or other power equipment, or to hotel operations, or dry cleaning facilities, or secretarial help.

The outlet for the marketing of such goods and services is usually based on a trademark or service mark or a trade name and a special décor (the "look") or design of the premises. The license of such a mark or name by its owner is normally combined with the supply by that owner of know-how in some form, either technical information, technical services, technical assistance or management services concerning production, marketing, maintenance and administration. The owner of such a mark or trade name and know-how is called a **franchiser** or **licensor**. The party to whom the license is granted and the know-how is supplied is called the **franchisee**, **distributor** or **dealer**. The franchisee, distributor or dealer may own the premises or contribute money and time as an investment in the business firm. Other aspects of the business relationship of the parties to the contract, including sharing of the profits of the franchise or distributorship, will be agreed to between the franchiser or licensor and the franchisee or distributor or dealer and set forth in a document called a **franchise agreement** or **distributorship agreement**.

As in the case of an assignment, a license contract and a know-how contract, the law may require that such franchise or distributorship agreements be registered and reviewed or examined and approved by one or more designated government authorities.

Turn-Key Project

In certain instances, two or more of the business arrangements, and hence the legal methods that they reflect, can be combined in such a way as to entrust the planning, construction and operation of a factory to a single technology supplier, or to a very limited number of technology suppliers.

Thus, the **turn-key project** may involve a comprehensive arrangement of certain legal methods, whereby one party undertakes to hand over to the client – the technology recipient – an entire industrial plant that is capable of operating in accordance with agreed performance standards. More usually, the turn-key project involves the undertaking by one party to supply to the client the design for the industrial plant and the technical information on its operation. In the latter event, supplementary arrangements might also be made for the acquisition of rights to the technology, for civil engineering work and for provision of technical services and assistance concerning the construction of the plant, the purchase and installation of equipment, raw materials or parts and components, training, and supervision of the operation of the plant, at least in its initial stages.

It is called a *turn-key* project because the end result is to *turn* over to the client the *key* to the door of the industrial plant. That is a symbolic way of expressing the completion of the tasks agreed to between the parties.

Joint Venture Arrangements

A joint venture is a form of alliance of two separate companies. The companies agree to act together, typically forming a separate legal entity, for a particular purpose. The exact form of the joint venture depends on the wishes of the parties to the joint venture and on national law. The formation of a joint venture can sometimes provide security for the owner of the intellectual property rights because of direct control on the venture.

There are two fundamental forms of joint venture, the equity joint venture and the contractual venture.

The equity joint venture is an arrangement whereby a separate legal entity is created in accordance with the agreement of two or more parties. The parties undertake to provide money or other resources as their contribution to the assets or other capital of that legal entity. That entity is usually established as a limited liability company and is distinct from either of the parties which participated in its creation. That company becomes the owner of the resources that are contributed by each party. Each of the parties in turn become the owners of the company, that is, each is said to have an equity in the company.

Where one or more of the parties is a foreign enterprise or entity, such a party is, or such parties are called a foreign participant. The parties or participants agree on the purposes and functions of the limited liability company; the proportion of the capital each will contribute to; and the share of each in the profits of the limited liability company; and on such other matters as its management, operation, duration and termination.

On the other hand, the contractual joint venture might be used where the establishment of a separate legal entity is not needed or where it is not possible to create such an entity. This may be the case where the project involves a narrow task or a limited activity or is for a limited time or where the laws of the country in which the business operation is to be conducted do not recognize the ownership of property by foreigners. The relationship between the parties will be set forth in the contract or agreement concluded between them.

The different legal methods for the commercial transfer and acquisition of technology can be used in either form of joint venture arrangement.

An assignment of the exclusive rights to a patented invention by one of the participants could constitute a portion of that participant's contribution to the capital of the joint venture company. It is also possible, of course, for one of the participants to grant a license of a patented invention to supply know-how as part of that participant's contribution to the joint venture company. A Special case of this arrangement could be a buy-back arrangement where the technology supplies gives a contractual commitment to buy back certain percentage of the output from the technology receiver at a – preset condition.

More commonly, however, such a license or the supply of know-how in one or more of its forms will be the subject of one or more contracts made after the joint venture company is established. Those contracts will be concluded between one of the participants as the transferor of the technology in question and the joint venture company. Through such contracts the technology in question can be transferred to the joint venture company, which will thus acquire the means to enable it to carry out its operations.

Whether one or more of the legal methods are used in the establishment of the joint venture company will be matter for negotiation between the prospective participants. The result of their negotiations will be reflected in the joint venture agreement. The license contract, the know-how contract, the technical services or the technical assistance contract, the franchise contract, and contracts covering other commercial matters, might even form annexes to the joint venture agreement. They would be signed once the joint venture company was established.

Needless to say the joint venture agreement, whether it be for the establishment of a limited liability company or not, and the different contracts of the various

legal methods that may be used, must be concluded in accordance with laws and regulations applicable to such companies and to the tax laws concerning those companies or to the laws relating to agency or partnership, as well as to other economic laws, including laws relating to labor, the sales of goods, insurance and to foreign economic and trade contracts.

For the successful transfer of a technology a number of activities have to be carried out, not all of which are sequential. It is also important to note that while the scientist, who has developed the technology, can carry out some of these activities; there are other specialised activities, which may have to be carried out by other groups (in-house or out-sourced). In many cases, some of these activities are carried out by the Licensee himself or by other intermediaries like technology transfer organisations, consultants etc.

Some of the major activities involved in technology transfer are:

- Technology evaluation – technical and commercial;
- Determination of market potential – covered in Technology Selling
- Preparation of Preliminary Technical Note (PTN)
- Preparation of comprehensive know how documents and laboratory note book;
- Measures to protect the technology and formulating a strategy for IPR protection;
- Preparation of Feasibility/ Project reports;
- Identifying potential licensees and other partners - covered in Technology Selling (licensees) and Technology Transfer (partners)
- Signing of Non-Disclosure (NDA)/ Confidentiality Agreement with interested party
- Demonstration of know-how / prototype
- Training of client personnel in the R&D institution / at client site
- Provide assistance in carrying out detailed design and engineering of the manufacturing plant – covered in Technology Transfer (Modes of Technology Transfer – **Turnkey Arrangements**)
- Provide assistance for erection, testing and commissioning of the manufacturing plant.
- Supervision of Erection, Testing and Commissioning of Plant & Machinery
- Troubleshooting and Debottlenecking
- Maintaining a long-term relationship with the client by having joint ventures, training of new personnel etc.
- Preparation of proposal for obtaining financial assistance, for further development

14.7 MAJOR TECHNOLOGY TRANSFER ORGANISATIONS IN INDIA AND ABROAD

Since knowledge transfer is s specialised, complex and legal issues related activity, most of the R&D Institutions and Universities do not have the necessary expertise. Over the years many Technology Transfer Promotion Organisations have been established with the assistance of the Government to facilitate the transfer and commercialization of know-how generated in such Institutions.

The oldest and most capable organisation in the technology transfer field is the National Research Development Corporation (NRDC), established in 1953. It deals with all technology sectors from ICT to Biotechnology, from medicines to machinery. NRDC also does not insist on any upfront payments for its technology transfer and licensing services. It generally shares 50-70& of its revenues earned from the licensees with the host institution / Inventors.

There are other major organisations in the area of technology transfer. These are :

- Asia Pacific Centre for Technology Transfer (APCTT)
- Biotechnology Consortium of India (BCIL)
- Foundation for Innovation and Technology Transfer (FITT), IIT, Delhi
- ANTRIX, Bangalore (for transfer of ISRO Technologies)
- Centre for Technology Transfer (C-Tech), - for the transfer of DRDO Technologies

Besides the above organisations there are many private consulting firms, which provide technology transfer services. Some of the major international organisations who can help in the transfer of indigenous technologies abroad are:

- The British Technology Group (BTG), UK
- Korean Institute of Technology, Seoul, South Korea
- ANWAR, Paris, France
- Tech Marts of China
- Asia Pacific Center for Technology Transfer

14.8 GOVERNMENT CONTROL ON TECHNOLOGY TRANSFER

In many developing countries, the inflow of technology is subject to a variety of controls as a means of ensuring that contracts concerning transfer of technology are consistent with the economic aims of the government. In some countries, these controls are part of a more comprehensive system of laws dealing with foreign investment in the country. In others, the controls result from the foreign exchange regulations which are directed at the flow of payments abroad, whether as dividends, royalties, or income in other forms or as the return of capital. Indirectly, import regulations, particularly lower tariff rates or exemptions on products embodying needed technology, may also have an effect on the inflow of technology. In still other developing countries, legal systems have been devised specifically to

control the transfer of technology to, or within, the country. These systems include the requirement that industrial property licenses and technology transfer agreements be notified to government authorities or be registered or approved by them in accordance with criteria established by the legislation or set forth in regulations or guidelines issued by appropriate governmental bodies.The failure of the responsible party to submit for registration or approval an industrial property license or technology transfer agreement or its modification, amendment, extension or termination, to the appropriate government authorities within the time limits and under the other conditions prescribed has a number of legal consequences. Under the relevant laws, the failure to comply may render the license or agreement void or unenforceable and subject the party responsible to a penalty or to the suspension of its right to trade or to loss of its business organisation status. The registration or approval of the license or the agreement may be a prerequisite to giving evidence of actual exploitation of a patent in the country, or obtaining an authorization from the fiscal authorities to make payments abroad or to receiving fiscal or other benefits designed to encourage or promote investment in certain sectors or industries.

14.9 REASONS FOR FAILURE OF A TECHNOLOGY

While there can be numerous reasons for the failure of a technology, which may be peculiar to that technology, the most common failure factors are highlighted below:

a) **Raw material based problems**

In any manufacturing process, the quality, the difficulty in collection, seasonal variations in the availability of the raw materials, transportation costs (particularly for bulky-low weight materials , safety of transportation of either the raw materials or the finished product) are of vital importance in the success or failure of a technology in the commercial market. Often, the scientist has not tested his process for the variability in the quality of the raw materials. He has used raw materials of a particular grade, or of a particular location, which is quite different from the raw materials available at the location of the new plant. The technology where the failure rate on this account is maximum, is in the Agro-food processing Sector, mineral processing technologies and plant based products and herbal medicines.

b) **Marketing Failure**

Marketing of the product is perhaps the most important factor, which results in the technology being a success or a failure. It is important to understand that the marketing factor assumes great importance in technologies related to new consumer products – Food and Agro processed products, electronic gadgets, ICT products, house hold durable goods, consumable products - in these sectors advertising, market launch of the product, building or utilizing an existing brand image, or riding on top of another branded product (selling an inflatable balloon as an atlas in conjunction with Pepsi) can make a make a big difference. The scientist can assist in providing the new features and advantages of the product for working out a strategy for not only the advertising ajency but also for marketing of the products. One has to realize that if your licensee has to compete with multinational or large companies,

having similar products, he needs to have deep pockets to bear the advertising and market launch expenses (which are non retrievable).

It also depends on the marketing strength of the Licensee, his wholesalers, marketing and distribution network; his financial capability to put the product in the market, without expecting any financial returns for the first 3-4 months. His credibility with his banker, wholesale, distribution, and retail partners, etc.

For example if CFTRI develops a new 777 cola product which is better than Pepsi/Coco Cola, and it is actually proved in trials, it still may not succeed in the market place, unless the Licensee has the stature of a Reliance or a Tata Company, who can opened Rs 20-30 crores in launch of the product. On the other hand, there could be a niche market; it could be local (like the long life paneer, and whey drink developed and sold by NDRI in Karnal, or a particular local taste that the drink could satisfy. It is fact that while Pepsi & Coco Cola have conquered almost the entire Indian market for bottled cold drinks, there are over 100 small SSI units who are surviving in fact thriving in marketing their product like the Masala Sweet Soda of ——— ——in Merrut.

c) **Site Location Problems**

While for some technologies (high tech/BPO/ICT) location may not be a problem, in the majority of technology transfer cases, location plays an important part in whether the technology would be commercially successful or not. The most important factor in developing countries, such as India, is the availability of fiscal concessions for setting up the project – such as sales tax exemption, export subsidies, equity support by the state industrial corporation, duty draw back, SEZ industrial estates, etc. There are also issues like allocation of mining rights (for ore processing technologies), other scarce raw materials, concessional electricity tariffs for industries whose raw material is electricity like aluminum,, transportation of bulk materials problems by train or shipment.. In many cases the technology is good, the economics apparently profitable, but the location becomes the crucial factor whether the technology would be commercially successful.

14.10 FUTURE SCENERIO OF TECHNOLOGY TRANSFER

Historically, over the century's technology transfer was a non-commercial activity. The technology transfer process took place through the education process. Knowledge, including the methods of manufacture of various goods was passed on to others without any monetary consideration. However, during the last century the Governments, the inventors, the scientists and above all the industries have imposed several restrictions on technology transfer to stay ahead of others. This has lead to more and more stringent patent laws, restrictions on export of strategically important technologies, particularly in the areas of defense and space.

Today, any useful knowledge is protected by a wide verity of IPR laws. It is highly priced and transferred only on commercial terms. For instance, there are a number of drug technologies, which have been developed for, critical and life taking diseases but these are prohibitively expensive and thus in reality are not

available to the poor people. What is going to happen in the future, it is difficult to say?

Even in the developed countries, there are various groups who are opposing the new stringent IPR laws. Only time will tell whether the creation of wealth in the hands of a few persons due to their control on new technologies, will continue to accumulate unhindered or that there would eventually be a slide down in the stringency of IPR laws for the benefit of the common man

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14.11 PRACTICAL EXAMPLES OF TECHNOLOGY TRANSFER

The basic principles and aspects of technology transfer have been brought out in the earlier part of this Module. However to have a better understanding of the technology transfer process – which in the real business world is very complex – let us examine the same through a few case studies. Some of these are based on real examples and some on futuristic technologies, which are still not in the market place.

Case No. 1

Concrete railway sleepers to replace wooden or cost iron sleepers:

The know how for this technology was developed by CBRI, Roorkee. The know how depicts the placement and size of reinforcement bars, the fixing and anchoring of fixtures on which the rails will be fixed through patented steel clips, the method of pre-stressing the reinforcement bars through a set of drawings and specifications for the various raw materials and components. Lastly, the method of testing (non-destructive as well as destructive, of the finished product to conform to the Railway Standards. Any qualified civil or structural engineer or a good entrepreneur can make the product based on the know how documents. At best, he may need to witness the casting of a few concrete sleepers at the Institute.

Case No. 2

Ferro cement tanks for storage of water:

The know how for the production of Ferro cement tanks was developed by SERC, Gaziabad (now a part of CBRI, Roorkee), This technology was transferred successfully NRDC to over 100 parties on the basis o handing over the know how documents which indicated the specifications of the raw materials, the fabrication drawings, casting methodology etc. The lump sum premium charged was a nominal Rs. 7500 with nil royalty.

Case No. 3

FM Radios:

With the advent of FM transmission in India, though belatedly, the demand for FM radios has increased sharply, particularly for radios in vehicles. Though the know how for FM radios was developed by the R&D wing of the All India Radio, there were very few takers for the know how. The reason was that it was not a new technology, there were no patents or circuit design registrations valid

because this technology had been adopted worldwide much earlier. An interested party only had to analyze an existing imported FM radio, the circuit designs were readily available through maintenance manuals or other published literature, and do reverse - engineering.

This a typical simple technology to replicate by reverse-engineering. There are many other such technologies where the transfer is easy, practically based on the know how documents (in this case the circuit wiring diagram).

Case No. 4

Chlorine Tablets:

Chlorine tablets are used for disinfections of drinking water. A number of R&D Institutions such as NEERI, Nagpur, RRL, Johrat etc have developed the know how for manufacture of this product. The know how is simple and can be easily replicated by an informed entrepreneur (with the assistance of a chemist) based on the know how documents. In fact NRDC has transferred the know how for this technology to over 100 parties very successfully.

Case No. 5

Low cost Balloon Atlas – Case of an Individual Inventor

An individual inventor comes up with a novel idea of developing a "Low Cost Balloon Atlas". He has seen inflatable balloons (one color) in the market place costing as little as one Rupee, on the other hand the available atlas globes, do not cost less than Rs 200, even the 150 cm diameter paper globes. He files a PCT application and a provisional Indian Patent Application for his invention Unfortunately he does not have the knowledge of how he can print the world map on a blue colored balloon. He is confident, having seen multi colored prints on round shaped cosmetic bottles, that it is possible.

If the inventor wishes to transfer the technology to other parties, rather than using his idea for his own manufacturing business, (many inventors want to keep on developing new products rather than getting bogged down on developing one new product up to the commercial scale). How does he go about it, firstly for licensing the patented know how and secondly to facilitate the development of the printing process, which may involve development of a new printing machine or a die to facilitate the development of the printing process? It may involve the modification of the balloon-manufacturing machine, to simultaneously facilitate 3 colored (at least) printing on the balloon before it is removed from the die head. Obviously, the inventor needs partnerships, perhaps with balloon manufacturers or printing machine manufacturers, or a Research Institution such as the National Institute of Packaging, Ahemdabad who can further develop his idea into a commercial product.

He also needs funding for the development of his idea into a product. He can apply under the Technoprenur (Tepp) Scheme of the Dept. of Scientific and Industrial Research (DSIR), which gives grants upto Rs. 10 lakhs for converting an idea into a market able product or a commercial scale technology that is **licensable**. The inventor has several options, and he has to choose one option to his best advantage, mental satisfaction and his long-term carrier goals. Some of these are listed below.

- License the know how (on the basis of the PCT and Indian Patent Application to an interested balloon manufacturer. Unfortunately, the balloon manufacturers are all small scale units, they may not be able to pay any large lump sum premium or even the Royalties would be insignificant, Either they would fudge their accounts or not pay the royalty. The other alternative is to license the know how/patent to a printing machine companies. They would be able to pay higher lump sum premium and royalty on the sales of the machines. But would, they be interested? Yes, if the inventor is able to access appropriate development grants under the Tep Programme, such equipment manufacturers would get interested. Often, in such cases the equipment manufacturers allow their equipment to be used for pilot-runs free of cost. While in Taiwan, South Korea and China equipment manufacturers have graduated to such partnerships, in India this not happened in any signifying way. The SSI units, in India are rapidly realizing that if they are to be competitive, they have to develop, produce and market new products for which they need the help of not only R&D Institutions/Universities but also individual inventors.

The advantages of having a Low Cost Balloon Atlas Globe are obvious Since the cost would be less than Rs. 5-10, hardly any add on cost due to packaging and transportation (like in the case of the existing paper based globe at case). The product could be sold to the schools; particularly Government supported schools on a mass scale 100 balloon Atlas in one pocket imagine, the social benefits, every child could have a Atlas globe in his house for less than Rs. 10.

In innovation or idea generation or methodology of technology transfer there are no fired rules, no single answer questions, there can be multiple solutions to the same problem. What solution you choose depends on many factors, depending ultimately an your own perception of the type of technology, the technical and financial capability of the interested parties, your own commitment as what to extent you want to get involved in the technology transfer process.

The above case study is specifically meant to stimulate the thinking on the technology transfer problems that an individual inventor faces and the possible solutions.

14.12 COMPOSITE EXAMPLES ILLUSTRATING THE PRINCIPLES OF PATENT LICENSING AND TECHNOLOGY TRANSFER FOR COMMERCIALISATION

Having learned the basic principles of technology selling and technology transfer, here are some composite examples to illustrate, in practice, both the aspects: (i) that is pricing of the technology and (ii) of the technology transfer process itself.

What were the final successfully negotiated technology fees, vis-à-vis the lump sum premium and /or royalty percentage, which were the key partners and the key technology transfer activities that resulted in success of the technology in the market place. These examples cover simple to complex technologies and also different but important industrial sectors.

Example 1:

Process for manufacture of Ferro cement tanks of 500-2000 liter capacity:

Simple technology covered by Indian Patent only, easy to copy and used by small civil engineering contractors.

Lump sum Premium : Rs 7,500

Royalty : Nil

Nature of License : Non-Exclusive

Above licensing terms were fixed by the Licensor for every Licensee.

Please note here that no royalty was charged because it was easy to copy. The lump sum premium was deliberately fixed at a low value to prevent the leakage of the know-how from one licensee to another party.

Example 2:

Product and process know how for manufacture of blood bags:

Technology development involved new polymer processing technology, design registration of the product in India, testing and statutory certification of the product both in India and abroad – Netherlands. Technology / IPR was licensed to 5 companies as per details given below:

No.	Year of License	Lump sum Premium	Royalty % on sales	Terms of License	Period of License
First Indian Licensee	1985	Rs.3 lakhs	3 %	Non Exclusive	10 years
Second Indian Licensee	1991 (after first licensee was successful)	Rs.14 lakhs	3.5 %	Non Exclusive	10 years
3rd & 4th Licensees	Simultane-ously in 1994 through tendering	Rs.45 lakhs each	3.5 %	Non Exclusive	10 years
5th Foreign Licensee	1995	Rs. 2.3 crores	3.5 %	Exclusive for manu-facture & sale in Indonesia.	10 Years

Please note here, how the value of the technology increased over the years after the various licensees successfully commercialised it.

Example 3:

Import of Technology for a lithium polymer battery

A famous multinational company in the USA developed the technology and over 45 patents in almost 100 countries covered the know-how and the process for manufacture of the raw material used in the product. The Licensor had product patents on the materials of the cathode, the anode, process patents for manufacturing of the same, design registration for the shape of the battery, trade

mark registration, and to top it all, they had various trade secrets covered under Trade Secrets Act. The Licensor had extensively protected their technology by filing PCT application, patents etc. In fact they had spent over US $ 1.5 million alone on the IPR protection. The technology was unique for the battery was a plastic film, that could be mounted on the roof of a car (Solar Car) or even on the roof / or walls of a house. The technology was licensed to 17 parties, the world over on a non-exclusive basis on the following terms.

Lump sum Premium : US $ 2.5 million to be paid in stages, but the first installment was pegged at US $ 1.5 million

Royalty : 5% on sales but this would be reduced if the quantum of sales exceeded certain quantities.

Nature of License : Non-Exclusive

Period of License : Validity of the over 45 patents; but also to be mutually extended to cover any new patents filed later, which would be valid for a much longer time.

Examples of imaginary new technologies/ IPR that is likely to be developed in future

Example 1: Anti-collision device for the railways

IIT has developed the know-how to prevent collisions & accidents in the railways. It is based on an old concept used in guided missiles, which detects if an oncoming missile is going to hit the airplane. The R&D team has used the basic concept of thermal detection, whether it is an oncoming train, or an animal or even a vehicle crossing the tracks at an unmanned crossing, to give an alarm to the train driver through a wireless based system. One prototype of the system has been developed and tested for its efficacy but only on a straight track. The Railways are interested to acquire the know-how and IPR. How would you price it:

No.	Pricing head	Options		
		Option I	Option II	Option III
1.	Lump sum Premium	Nil	Rs 2-5 Lakhs	Rs 10-20 Lakhs
2.	Royalty on sales	8-10%	3-5%	1-3%
3.	Exclusivity	Exclusive for Indian Railways	Non Exclusive	Limited period Exclusivity

Answer

Option 1 is the most suited, because the Railways very rarely buy technology, they buy only products. There interest in new technology is only to carry out the field trials. However, after the railways have approved the product the technology can be licensed to a major electronic manufacturing company such as ECIL, BHEL, etc at the terms given in option 3 with limited period exclusivity.

Example 2: The new mouse trap

The technology is simple but new, the individual inventor has used electronic music to attract the mouse to the trap instead of a piece of food. He has obtained a USA patent for his invention, his patent in India is still under consideration How would you price his patent for the Indian / USA market:

S.No.	Pricing head	Options		
		Option I	Option II	Option III
1.	Lump sum Premium (India)	Rs 5000	Rs 50,000	Rs 2 Lakhs
2.	Royalty on sales	Nil for India, 3 percent on sales in USA or other countries.		
3.	Lump sum Premium (USA)	US$ 5000	US$ 50,000	US$ 200,000

Answer

Lump sum premium of Rs. 5000 without any royalty. There would be hardly any takers of the technology in India. For who makes the mousetraps, the local carpenter; and who sells them; the footpath shopkeeper on the roadside. But in the US where plastic mouse traps are made by small industries and sold through large stores like Wall Mart etc.; one could possibly charge a lump sum premium of around $ 5,000 and in addition a % royalty could be negotiated between 0-5% on sales.

14.13 SUMMARY

- After the licensing of the patent, the next process that is the technology transfer process begins and it is a complex process. It involves a number of activities, such as preparation of a preliminary technical note which serves as the basis of the first communication to prospective licensees, preparation of material samples or prototypes, preparation of comprehensive know-how document etc. It is pertinent to note that in many cases, a substantial portion of the technology is disclosed (transferred) to perspective licensee(s), even before the license agreement is signed and if care is not taken, the complete know-how could be inadvertently passed on, in which case the prospective licensee may just walk away with the know-how without signing the license agreement or making any payments.
- This Unit enumerates the various activities involved in technology transfer, before the signing of the license agreement and after the signing of the license agreement. It brings forth the safe guards that need to be taken by the licensor and the licensee. at each step of the technology transfer process to safeguard their respective interests. It explains the different mechanisms used for technology transfer with illustrative examples/case studies. And finally, it lists the most common reasons for failure of a patent being successfully commercialized, particularly due to inadequacies in the technology transfer process.

14.14 TERMINAL QUESTIONS

Case No. 1

An Individual Inventor has developed the concept of a Digital Fountain Clock (A Digital Clock formed by water, where digits of the clock e.g. 10:40 are formed by making use of water made to flow in certain fountains, similar to musical fountains. This is particularly suitable for locations in and around high rise buildings, shopping malls, hotels, airports etc) He has obtained a patent for the same in India.

a) Who could be the potential licensees?

b) What should be the approximate licensing terms (lumpsum premium and royalty)?

c) Who could be the collaborating partners?

Case No. 2

A Chinese Company has developed a patented flat plate speaker using MEM technology. The speakers are like a painting frame and provide high quality performance compared to the existing box speakers. The Chinese company has already successfully commercialized the technology. They would like to license the technology to an Indian Company on payment of lump sum amount US$ 1million + 5% Royalty on annual sales.

a) Who could be the prospective licensees in India?

b) What should be the exclusivity terms?

c) Should the Indian Licensee Insist on Joint Venture with equity participation

14.15 ANSWERS AND HINTS

Self Assessment Questions

1) Refer to Section 14.3

Terminal Questions

Case No. 1

a) Existing Fountain Equipment Manufacturers, Major Property Developers such as DLF, Ansal, etc, Famous Hotels, Hospitals, Tourist Resorts, Parks, Archaeological Sites etc.

b) Technology fees of around Rs 2-5 lakhs lump sum per fountain or 5% of the cost of the construction of the fountain.

c) Existing Fountain Equipment Manufacturers, Architects, Engineering Consultants, Large Contractors, Builders, Technology Development Financing Agencies (Ministry of Urban Development, Ministry of Tourism) etc.

Case No. 2

a) Consumer Electronic Product Manufacturers (BPL, Akai), MEM Manufacturers, Audio Equipment Manufacturers like Bose, etc.)

b) Negotiate Exclusive Territory rights for manufacture and sale in India and neighboring / SAARC Countries for at least 5-7 years.

c) Negotiate for equity participation to the extent of 26% with exclusive use of joint brand names such as BPL-Sanyo etc. Business Operations can proceed with SKD/ CKD and then progress to complete indigenous manufacture over a period of 5 years.

14.16 REFERENCES AND SUGGESTED READINGS

1) The Nudist on the Late Shift, By P.O.Bronson,, Secker & Warburg LONDON, 1999

2) Rembrandts in the Attic, Kevin G Rivette & David Kline, Havard Business School Press

3) Warshofsky, Patent Wars, 18

4) The Intellectual Capital Monitor: Patents and Performance (New Britain, Penn.) March 1999.

5) Intellectual Property and Competitive Strategies in the 21st Century, Shahid Alikhan & Raghunath Mashelkar, Kluwer Law International, 2004

6) Technology Transfer in Some Asian Countries, Asian Productivity Organisation, 1979, Tokyo.

7) WIPO Asian Regional Symposium on the Promotion of Invention and Innovation, WIPO India 1992

[This unit should be restructured to cover basic aspects of tech transfer, need for TT, organisation support, Government role in TT. Standard TT agreements, Examples of successful TT , NRDC, BTG and other related organisation involved in TT. Industry university relationship, public funded research and TT etc.]

UNIT 15 PATENTS AND INDIAN BIODIVERSITY ACT

Structure

15.1 INTRODUCTION

Bio-resources are useful for human existence. Its indiscriminate exploitation remains the concern of all the nations. It lead to depletion of biodiversity and its conservation began to emerge as major concern of the bio resources rich nations. The race to convert green gold to gene gold is on. Biodiversity convention at Earth Summit in Rio de Janeiro on 5 June 1992 for the first time recognized that conservation of biological diversity is "a common concern of humankind" and is an integral part of the development process. This convention was signed by 159 countries. An

International Treaty on Plant Genetic Resources for Food and Agriculture which came in to force 29 June 2004 is another comprehensive international agreement in harmony with the Convention on Biological Diversity, which seeks to ensure food security through the conservation, exchange and sustainable use of the world's plant genetic resources for food and agriculture (PGRFA), as well as the fair and equitable benefit sharing arising from its use. Efforts are going on to bring the issue of Traditional knowledge (TK) linked to genetic resources (GR) or biological resources in World Intellectual property Organizations and Intergovernmental Committee (IGC) on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore is working to conclude a treaty on TK ,GR and folklore.

In this context relation of intellectual property with genetic and biological resources became evident when some private multinational companies used the biological resources obtained used from bio resources rich countries and obtained patent protection by using such resources. The first bioprospecting controversy surfaced in 1999–2000 when The Maya ICBG an International Cooperative Biodiversity Group led by Ethnobiologist Dr. Brent Berlin was accused of being engaged in unethical forms of bioprospecting (biopiracy) by using knowledge linked to biodiversity of Chiapas, Mexico by several NGOs and indigenous organizations. Later neem, enola been, basmati rice and hodia related patents brought the IP related issues into fore front which led to revoking to patents based on the genetic resources in USA and Europe.

National intellectual property offices led by Brazil, Maxico and India took initiatives to protect biological resources by various means. In India disclosure of source of origin of biological resource used for obtain patent was made mandatory for obtaining patents. The permissions from biodiversity Authority was also made necessary.

15.2 OBJECTIVES

After reading this unit, you should be able to:

- explain the provisions of the convention on Biological Diversity ~~Act.~~ (CBD);
- make a comparison between the convention on biodiversity ~~act~~ and the Indian biodiversity act, 2002;
- describe the patent act and the protection of Bio-resources;
- draft the application format for access to biological resources and Associated Traditional Knowledge (Form 1);
- draft the application format for seeking prior approval of national biodiversity authority for transferring the result of research to foreign nationals, companies, NRIs for commercial purpose (Form 2) and Form 3; and
- explain the functions and powers of biodiversity boards.

15.3 CONVENTION ON BIOLOGICAL DIVERSITY, 1992 (CBD)

The Convention on Biological Diversity (CBD) was ratified by 159 member countries in 1992. The main objectives of the Convention are aimed at conservation of biological diversity and sustainable use of bio-resources and equitable sharing

of benefits arising from the use of these resources. The sustainable use as per the definition of the Convention specifies that the use of bio-resources should be at a rate that may not lead to the decline of biodiversity.

CBD upholds the rights of the several nations to design their own environmental policies and means to use and exploit their bio-resources and take necessary steps to ensure that the environments of other national jurisdictions are not adversely affected.

The Convention further states the various steps to identify components of Biological Diversity and its monitoring. It also states that the guidelines be developed for selection, establishment and management of protected areas to conserve biological diversity. It further states that the steps be taken to restore ecosystems which are in disarray and also rehabilitate and recover threatened species. While aiming at the overall objective of conservation and sustainable use of biological diversity, CBD categorically states that traditional knowledge, practices, innovations and systems be preserved and promoted and efforts be made to involve holders of traditional knowledge in the diffusion of such knowledge and provide for necessary means to share benefits arising from the utilization of such knowledge.

CBD also states that the member states must create awareness about the conservation and sustainable use of biodiversity and establish necessary programmes for education and training for carrying out such activities. The Convention further provides that states may determine as to how the access need to be provided to their bio-resources and how the prior informed consent be obtained.

The Convention also provides that the contracting parties exchange information about the various activities undertaken by them and promote international technical and scientific collaboration amongst the member states.

It is also clearly stated that provisions of the Convention should not affect the rights of the member states from existing international agreements except those which could be detrimental to the conservation and use of bio-resources.

15.4 CBD AND BIODIVERSITY ACT OF INDIA, 2002

India is a party to the Convention on Biodiversity (CBD), 1992 which came into force on 29th December, 1993. The objectives of CBD are to facilitate access to genetic resources by the member countries subject to provisions of the national legislations and on mutually agreed terms. CBD also recognizes the contributions of local and indigenous communities to the conservation and sustainable utilization of biological resources through traditional knowledge, practices and innovations. In conformity with the provisions of CBD, the Biodiversity Act of India, 2002 and certain sections of the said Act came into force on the dates as stated below:

01st October, 2003	sections 1 and 2; sections 8 to 17[both inclusive] ; sections 48, 54, 59, 62, 63, 64 and 65 [pertaining to establishment and administrative functions of NBA].

01st July, 2004

sections 3 to 7 [both inclusive];

sections 18 to 47 [both inclusive];

sections 49 to 53 [both inclusive];

sections 55 to 58 [both inclusive];

sections 60 and 61.

The main objective of the Biological Diversity Act (BDA) Act is to provide for conservation, sustainable utilization and equitable sharing of the benefits arising out of utilization of India's vast biological resources and knowledge associated thereto.

Self Assessment Question **(Spend 2 minutes)**

1) When did India sign the CBD?

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2) What are the objectives of Indian Biodiversity Act?

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15.5 PROVISIONS IN BDA

As per Section 2 of the Indian Biological Diversity Act, some of the important expressions have been defined as follows:

- "benefit claimers" means the conservers of biological resources, their byproducts, creators and holders of knowledge and information relating to the use of such biological resources, innovations and practices associated with such use and application;
- "biological diversity" means the variability among living organisms from all sources and the ecological complexes of which they are part, and includes diversity within species or between species and of eco systems;
- "biological resources" means plants, animals and micro organisms or parts thereof, their genetic material and by products (excluding value added products) with actual or potential use or value, but does not include human genetic material;

- "bio-survey and bio utilization" means survey or collection of species, subspecies, genes, components and extracts of biological resource for any purpose and includes characterization, inventorisation and bioassay;
- "commercial utilization" means end uses of biological resources for commercial utilization such as drugs, industrial enzymes, food flavors, fragrance, cosmetics, emulsifiers, oleoresins, colors, extracts and genes used for improving crops and livestock through genetic intervention, but does not include conventional breeding or traditional practices in use in any agriculture, horticulture, poultry, dairy farming, animal husbandry or bee keeping;
- "fair and equitable benefit sharing" means sharing of benefits as determined by the National Biodiversity Authority under Section 21;
- "research" means study or systematic investigation of any biological resource or technological application, that uses biological systems, living organisms or derivatives thereof to make or modify products or processes for any use;
- "State Biodiversity Board" means the State Biodiversity Board established under Section 22;
- "sustainable use" means the use of components of biological diversity in such manner and at such rate that does not lead to the long term decline of the biological diversity thereby maintaining its potential to meet the needs and aspirations of present and future generations;
- "value added products" means products which may contain portions or extracts of plants and animals in unrecognizable and physically inseparable form.

15.6 SOURCING BIOLOGICAL MATERIAL AND ASSOCIATED KNOWLEDGE FROM INDIA

Under Section 3 foreigners, non-resident Indians, foreign organizations either registered abroad or participating in a venture in India have to seek approval to access biological material and associated knowledge from India. Accordingly, Section 3 of BDA states that the following persons should not, without previous approval of the National Biodiversity Authority, obtain any biological resource occurring in India or knowledge associated thereto for research or for commercial utilization or for bio-survey and bio-utilization:

a) a person who is not a citizen of India;

b) a citizen of India, who is a non-resident as defined in clause (30) of Section 2 of the Income-tax Act, 1961;

c) a body corporate, association or organization-

   i) not incorporated or registered in India; or

   ii) incorporated or registered in India under any law for the time being in force which has any non-Indian participation in its share capital or management;

- Section 4 defines that no person shall without the previous approval of the National Biodiversity Authority, can transfer the results of any research relating

to any biological resources occurring in, or obtained from, India for monetary consideration or otherwise to any person defined as above in Section 3.

Transfer excludes publication of research papers or dissemination of knowledge in any seminar or workshop, if such publication is as per the guidelines issued by the Central Government.

Exceptions:

Section 5 states that all collaborative research projects between institutions including those in other countries which conform to the policy guidelines issued by the Central Government and/or be approved by the Central Government do not attract the provisions of Sections 3 and 4.

Self Assessment Question **(Spend 2 minutes)**

3) What is NBA?

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4) Who needs to get permission for using Indian biological resources?

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15.7 OBTAINING APPROVAL FOR SEEKING IP RIGHTS IN INDIA OR ABROAD

- Section 6 provides that no person shall apply for any intellectual property right, by whatever name called, in or outside India for any invention based on any research or information on a biological resource obtained from India without obtaining the previous approval of the National Biodiversity Authority before making such application.
- Provided that if a person applies for a patent, permission of the National Biodiversity Authority may be obtained after the acceptance of the patent but before the sealing (grant) of the patent, by the patent authority concerned.
- The National Biodiversity Authority may, while granting the approval under this section, impose benefit sharing fee or royalty or both or impose conditions including the sharing of financial benefits arising out of the commercial utilization of such IP rights.

15.9 ACCESS TO BIO-RESOURCES

- Section 7 provides that no person, who is a citizen of India or a body corporate, association or organization which is registered in India, shall obtain any biological resource for commercial utilization, or bio-survey and bio-utilization for commercial utilization except after giving prior intimation to the State Biodiversity Board concerned.

Exception:

The provisions of Section 7 shall not apply to the local people and communities of the area, including growers and cultivators of biodiversity, and vaids and hakims, who have been practicing Indian medicines.

15.10 SEEKING BDA'S APPROVAL FOR OBTAINING A BIOLOGICAL RESOURCE AND MATTERS RELATED THERETO

Section 19 provides that any person referred to as above in section 3 who intends to obtain any biological resource occurring in India or knowledge associated thereto for research or for commercial utilization or for bio-survey and bio-utilization or transfer the results of any research relating to biological resources occurring in, or obtained from, India, shall make application in a prescribed form and on payment of prescribed fees. Such information is to be furnished on the following points along with a declaration in the prescribed format.

15.11 APPLICATION FORMAT FOR ACCESS TO BIOLOGICAL RESOURCES AND ASSOCIATED TRADITIONAL KNOWLEDGE (FORM 1)

A. Full particulars of the applicant

i) Name:

ii) Permanent address:

iii) Address of the contact person / agent, if any, in India:

iv) Profile of the organization (personal profile in case the applicant is an individual. Please attach relevant documents of authentication):

v) Nature of business:

vi) Turnover of the organization in US$:

B. Details and specific information about nature of access sought and biological material and associated knowledge to be accessed

A) Identification (scientific name) of biological resources and its traditional use:

B) Geographical location of proposed collection:

C) Description / nature of traditional knowledge (oral / documented):

D) Any identified individual / community holding the traditional knowledge:

E) Quantity of biological resources to be collected (give the schedule):

F) Time span in which the biological resources is proposed to be collected:

G) Name and number of person authorized by the company for making the selection:

H) The purpose for which the access is requested including the type and extent of research, commercial use being derived and expected to be derived from it:

I) Whether any collection of the resource endangers any component of biological diversity and the risks which may arise from the access:

i) Details of any national institution which will participate in the Research and Development activities.

ii) Primary destination of accessed resource and identity of the location where the R&D will be carried out.

iii) The economic and other benefits including those arriving out of any IPR, patent obtained out of accessed biological resources and knowledge that are intended, or may accrue to the applicant or to the country that he/she belongs

iv) The biotechnological, scientific, social or any other benefits obtained out of accessed biological resources and knowledge that are intended, or may accrue to the applicant or to the country that he/she belongs

v) Estimation of benefits that would flow to India/communities arising out of the use of accessed bio-resources and traditional knowledge

vi) Proposed mechanism and arrangements for benefit sharing.

vii) Any other information considered relevant.

DECLARATION:

I/ we declare that:

- Collection of proposed biological resources shall not adversely affect the sustainability of the resources;
- Collection of proposed biological resources shall not entail any environmental impact;
- Collection of proposed biological resources shall not pose any risk to ecosystems;
- Collection of proposed biological resources shall not adversely affect the local communities;

I/we further declare the Information provided in the application form is true and correct and I /We shall be responsible for any incorrect / wrong information.

15.12 APPLICATION FORMAT FOR SEEKING PRIOR APPROVAL OF NATIONAL BIODIVERSITY AUTHORITY FOR TRANSFERRING THE RESULTS OF RESEARCH TO FOREIGN NATIONALS, COMPANIES, NRIS, FOR COMMERCIAL PURPOSES (FORM 2)

A. Full particulars of the applicant

   i) Name

   ii) Address:

   iii) Professional profile

   iv) Organizational affiliation (Please attach relevant documents of Authentication):

B. Details of the results of research conducted

C. Details of the Biological resources and /or associated knowledge used in the research.

D. Geo-graphical location from where the biological resources used in the research are collected

E. Details of any traditional knowledge used in the research and any identified individual /community holding the traditional knowledge

F. Details of institution where R&D activities carried out.

G Details of the individual / organization to whom the research results are intend to transfer.

H. Details of economic, biotechnological, scientific or any other benefits that are intended, or may accrue to the individual /organization due to commercialization of transferred research results.

I. Details of economic, biotechnological, scientific or any other benefits that are intended, or may accrue to the applicant seeking approval for transfer of results of research.

J. Details of any agreement or MOU between by the proposed recipient and applicant seeking approval for transfer of results of research.

15.13 APPLICATION FOR SEEKING PRIOR APPROVAL OF NATIONAL BIODIVERSITY AUTHORITY FOR APPLYING FOR INTELLECTUAL PROPERTY RIGHTS (FORM 3)

A. Full particulars of the applicant

   i) Name

   ii) Address

   iii) Professional profile

iv) Organizational affiliation (Please attach relevant documents of authentication)

B. Details of the invention on which IPR is sought.

C. Details of the Biological resources and /or associated knowledge used in the invention.

D. Geo-graphical location from where the biological resources used in the invention are collected.

E. Details of any traditional knowledge used in the in the invention and any identified individual /community holding the traditional knowledge.

F. Details of institution where Research and Development activities carried out.

G Details of economic, biotechnological, scientific or any other benefits that are intended, or may accrue to the applicant due commercialization of the invention.

Self Assessment Questions **(Spend 2 minutes)**

5) How can a person get permission for using biological resources in India?

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6) What are the various provisions and Forms related with access to these ..... resources?

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15.14 BENEFIT SHARING AND OTHER PROVISIONS

Section 21 details the determination of equitable benefit sharing by National Biodiversity Authority. The National Biodiversity Authority shall while granting approvals under Section 19 or Section 20 ensure that the terms and conditions subject to which approval is granted secures equitable sharing of benefits arising out of the use of accessed biological resources, their by-products, innovations and practices associated with their use and applications and knowledge relating thereto in accordance with mutually agreed terms and conditions between the person applying for such approval, local bodies concerned and the benefit claimers.

The National Biodiversity Authority shall, subject to any regulations made in this behalf, determine the benefit sharing which shall be given effect in all or any of the following manners, namely:

a) grant of joint ownership of intellectual property rights to the National Biodiversity Authority, or where benefit claimers are identified, to such benefit claimers;

b) transfer of technology;

c) location of production, research and development units in such areas which will facilitate better living standards to the benefit claimers;

d) association of Indian scientists, benefit claimers and the local people with research and development in biological resources and bio-survey and bio-utilization;

e) setting up of venture capital fund for aiding the cause of benefit claimers;

f) payment of monetary compensation and non-monetary benefits to the benefit claimers as the National Biodiversity Authority may deem fit.

15.15 ISSUES WHICH NEED TO BE ADDRESSED

Some of the concerns and issues raised by the researchers, practitioners and academics are being looked into by NBA:

a) Link between BDA and the Patents Act to avoid any contradictions in terms of operation of law;

b) Notification of traditional commodities falling under the definition of biological resources;

c) Licensing of inventions and realizing value from such licensing is a complex issue. Therefore, necessary guidelines for the benefit sharing amongst the stakeholders are under formulation.

15.16 FUNCTIONS AND POWERS OF NATIONAL BIODIVERSITY AUTHORITY (NBA)

It shall be the duty of the NBA to develop guidelines for access to Indian biological resources and for the equitable benefit sharing arising from the use of such resources. NBA is also authorized to advise the State Government in the selection of area which could be notified as heritage sites and may take measures for management and conservation of such sites.

NBA can also undertake opposition to the grant of patents based on Indian bio-resources or associated Knowledge. Further, NBA has also been authorized to oppose grant of any foreign patents wrongfully obtained based on Indian bio-resources or knowledge associated with such resources.

15.17 FUNCTIONS AND POWERS OF STATE BIODIVERSITY BOARDS

The State Biodiversity Boards would advise the State Governments on various issues pertaining to conservation and sustainable use of bio-resources and matters pertaining to benefit sharing arising from the use of such resources. The State Biodiversity Boards may regulate granting of approvals or requests for commercial utilization or bio-survey or bio-utilization of any biological resource by Indians.

The State Biodiversity Boards are empowered to restrict certain activities that may be detrimental to the conservation of bio-resources. Accordingly, any Indian citizen, body corporate or organization/association shall intimate the concerned State Biodiversity Board about the intended use of bio-resource for commercial utilization or bio-survey. The State Biodiversity Boards in consultation with local bodies may prohibit or restrict such an activity.

15.18 SUMMARY

- The Convention on Biological Diversity was ratified by 159 member countries in 1992. The main objectives of the Convention aimed at a conservation of Biological Diversity and sustainable use of bio-resources and equitable sharing of benefits arising from the use of these resources.
- The Convention further provides that states may determine as to how the access need to be provided to their bio-resources and how the prior informed consent be obtained.
- The objectives of CBD are to facilitate access to genetic resources by the member countries subject to provisions of the national legislations and on mutually agreed terms.
- The main objective of the Biological Diversity Act (BDA) is to provide for conservation, sustainable utilization and equitable sharing of the benefits arising out of utilization of India's vast biological resources and knowledge associated thereto.
- Under Section 3 foreigners, non-resident Indians, foreign organizations either registered abroad or participating in a venture in India have to seek approval to access biological material and associated knowledge from India.
- Under the Section 3(p) of the Patents Act, inventions related to the Traditional Knowledge are not patentable. Non-disclosure of "source and geographical origin of the biological material" amounts to the invalidation of the patent rights. However, Patents Act does not provide for any mechanism for benefit sharing in respect of inventions arising from the use of Indian Bioresources and Associated Knowledge.
- Section 21 details the determination of equitable benefit sharing by National Biodiversity Authority. The National Biodiversity Authority shall, subject to any regulations made in this behalf, determine the benefit sharing. It shall be the duty of the NBA to develop guidelines for access to Indian biological resources and for the equitable benefit sharing arising from the use of such resources.
- NBA has also been authorized to oppose grant of any foreign patents wrongfully obtained based on Indian bio-resources or knowledge associated with such resources.
- The State Biodiversity Boards would like NBA advise the State Governments on various issues pertaining to conservation and sustainable use of bio-resources and matters pertaining to benefit sharing arising from the use of such resources.
- The State Biodiversity Boards are empowered to restrict certain activities that may be detrimental to the conservation of bio-resources.

15.19 TERMINAL QUESTIONS

1) What are the main objectives of Biodiversity Act of India, 2002?

2) What are the functions and powers of NBA?

3) What is Benefit Sharing? Explain the provisions for Benefit Sharing by NBA in Biodiversity Act of India.

15.20 ANSWERS AND HINTS

Self Assessment Questions

1) Refer to Section 15.4

2) Refer to Section 15.3 .

3) India signed the CBD on 29th December, 1993.

4) The main objective of BDA is to provide for conservation, sustainable utilization and equitable sharing of the benefit arising out of utilization of India vast biological resources and knowledge associated with it.

5) NBA refer to the National Biodiversity Authority

6) As per section 3, foreigners, non-resident Indian foreign organisation either registered abroad or participating in a verture in India have to seek approval to use Indian biological resources.

7) A person get permission for using biological resources in India by make application in a prescribed form and on payment of prescribed fees.

8) Form 1, Form 2 and Form 3.

Terminal Questions

1) Refer to Section 15.3

2) Refer to Section 15.15

3) Refer to Section 15.13

AGREEMENT FOR SEEKING INTELLECTUAL PROPERTY RIGHTS

This Agreement is entered into as of the ..... day of ....., 2005 in accordance with Section 6 of the Biological Diversity Act, 2002 and Rule 18 of the Biological Diversity Rules, 2004.

Between

National Biodiversity Authority (Hereinafter referred to as "the **NBA**") having its office at 475, 9th South Cross Street, Kapaleeswar Nagar, Neelankarai, Chennai – 600041, India. (www.nbaindia.org).

and

..... (Hereinafter referred to as "the **ABC**", and includes the legal heirs, assigns, successors and administrators).

Hereinafter, the NBA and ABC shall collectively be referred to as "the Parties" and individually as "Party".

WHEREAS:

NBA has been established by the Government of India under the powers granted to it by section 8 of the Biological Diversity Act 2002 (No. 18 of 2003). Under the said Act, NBA is the authority to permit access to any biological resources and/or associated knowledge found within the territory of India.

ABC is a Company/University/Individual/Trust etc., who/which is desirous of obtaining intellectual property rights in the territories of ..... for an invention based on research or information on a Biological Resource and/or associated knowledge obtained from India.

ABC has made an application in Form III, under Rule 18 of the Biological Diversity Rules 2004 to seek approval from the NBA prior to obtaining the intellectual property rights on the Invention involving the use of the accessed Biological Resource and/or associated knowledge.

The Parties hereto agree as follows:

1. **Definitions**

In this Agreement, unless the context otherwise requires:

Act means the Biological Diversity Act, 2002 (No. 18 of 2003) and includes the Rules/Regulations/Guidelines/Notifications made under it.

Biological Resources: means biological resources as defined in the Act (and includes any associated knowledge) to which ABC had access to and which finds mention in the application seeking intellectual property rights made to the appropriate authority and which is as described in Schedule A to this Agreement.

Invention means the invention which ABC seeks to protect by applying for the intellectual property right and has been sufficiently described in Schedule B to this Agreement.

IPR means the intellectual property right to be granted to the Invention by

the appropriate authority and would also include the actual grant of any intellectual property right over the Invention described in Schedule B.

2. Grant of Approval

2.1 ABC requests for approval and the NBA hereby grants the approval to seek IPR protection over the Invention in the territories mentioned in Schedule C subject to the terms and conditions set forth in this Agreement.

2.2 ABC agrees to take prior approval of NBA in the event of seeking IPR protection in any other territory not mentioned in Schedule C.

2.3 ABC hereby agrees that this Agreement shall not in any way constitute or be presumed to constitute a partnership, joint venture or joint enterprise in any way or for any purpose between the Parties hereto or make them in any way liable as partners of or as agents for one another. No Party has the authority to act for or to assume any obligation or responsibility on behalf of the other Party and the relationship between the Parties is that of a person and a statutory authority competent to approve certain actions under the Act.

3. Assignment and Transfer

3.1 In the event of any assignment or transfer (by way of licensing or any other means) of the IPR in whole or in part by ABC to any person whether voluntarily or involuntarily, by operation of law or otherwise, all obligations under this Agreement shall accrue on such assignee or transferee. ABC undertakes to attach this Agreement as an appendix to the instrument making such assignment or transfer of IPR.

3.2 The Approval granted under this Agreement shall not be construed as an approval granted to ABC for transfer, distribute or part with in any manner, the Biological Resources and/or associated knowledge obtained by the ABC. In the event of ABC desiring to use the Biological Resources and/or associated knowledge for commercial purposes to exploit the IPR, ABC agrees to make an application under the appropriate provisions and forms under the Act for access to Biological Resources and/or associated knowledge as a raw material for commercial production.

4. Obligations of the IPR holder

4.1 ABC undertakes to:

A. Notify in writing to the NBA on the grant of IPR, within thirty days from the grant.

B. Keep NBA informed of any commercialization made on the IPR granted

C. Share benefits obtained as a result of obtaining the IPR with the different Stakeholders as directed by the NBA

D. Employ local people, in the event ABC chooses to set up his/ its own business unit in India to exploit the IPR granted.

4.2 ABC will seek to utilize India as its first source of supply and/or cultivation for raw (natural product) materials required for exploitation of the IPR, if such material can be made available in quantities and quality sufficient for use by ABC at a mutually agreeable fair price. If such material must be cultivated, ABC agrees to seek to utilize territory under the control of the Republic of India as its first source of such cultivation efforts.

4.3 All Licenses and sub-licenses granted by ABC for exploiting the IPR shall contain such clauses from this Agreement which ensures the flow of benefits to the benefit claimers and other stakeholders in India, more particularly to utilize India as first source of supply and/ or cultivation for raw materials (Biological Resources) required for exploitation of the IPR.

5. Fees, Royalty and other Benefit Sharing [will change on a case by case basis and will be regulated by the ABS guidelines]

5.1 XYZ shall pay to the National Biodiversity Fund, annually, during the term of this Agreement a royalty of……% as agreed of the total sales of the Product derived from the use of the Biological Resource accessed.

5.2 NBA shall direct XYZ to share the benefits in all or any of the following manner namely as per sub section 2 and 3 of Section 21 of the Biological Diversity Act, 2002:

a) grant of joint ownership of Intellectual Property Rightss to NBA, or where benefit claimers are identified, to such benefit claimers.

b) Transfer of technology

c) Location of production, research and development units in such areas which will facilitate better living standards to the benefit claimers;

d) Association of Indian scientists, benefit claimers and the local people with research and development in biological resources and bio-survey and bio-utilization;

e) Setting up of venture capital fund for aiding the cause of benefit claimers.

f) Payment of monetary compensation and non monetary benefits to the benefit claimers as the National Biodiversity Authority may deem fit

6. Reports and Audit

6.1 The ABC shall submit to NBA half yearly reports on the following:

a) the number of agreements entered in to for the commercial exploitation of the IPR

b) the amount of royalty received by ABC as a result of such agreements.

c) any Products manufactured by ABC, based on the IPR or improvements made on it and made available in the market.

d) the total billings of such Products (ex factory), if any

e) any other information sought by the NBA by a written notice.

6.2 ABC shall keep accurate records (together with supporting documentation) required to determine the amount of royalties due to NBA. Such records shall be retained for at least three (3) years following the end of the reporting period to which they relate.

6.3 The records mentioned in clause 6.2 should be made available during normal business hours for audit by any person authorised by NBA, for the sole purpose of verifying reports and payments hereunder. In conducting audits pursuant to this clause, such person shall have access to all records which he reasonably believes to be relevant to the calculation of royalties. Such authorized person shall not disclose to NBA any information other than information relating to the accuracy of reports and payments made thereunder.

6.4 The audit by such authorized person shall be at the expense of NBA, except that if such audit shows an underreporting or underpayment in excess of five percent (5%) for any twelve (12) month period, then ABC shall pay the cost of such examination as well as any additional sum that would have been payable to NBA had the ABC reported correctly, plus interest on said sum at the rate of twelve per cent (12%) per month from the date of the incorrect report.

7. Liabilities and Indemnification

7.1 ABC shall be solely responsible for any claims by third parties arising from the ABC's acts or omissions in the course of performing this Agreement and under no circumstances shall the NBA be held responsible for any such claims by third parties.

7.2 ABC indemnifies and save harmless NBA and its employees from and against all claims, demands, losses, damages, costs (including attorney fees), actions, suits or other proceedings, all in any manner based upon, arising out of, related to, occasioned by or attributable to, any acts or conduct of the ABC, its employees or agents, (whether by reason of negligence or otherwise) in the performance by the ABC of the provisions of this Agreement or any activity undertaken or purported to be undertaken under the authority or pursuant to the terms of this Agreement.

7.3 The ABC shall be deemed to be in material breach of this Agreement, if he/it fails to ensure proper flow of benefit sharing and other fees mentioned in clause 5 of this Agreement. ABC undertakes to make good all such losses as determined by the NBA in its yearly audits, within 15 days from the date of any such notice to that effect is communicated to the ABC.

7.4 The ABC undertakes to pay a sum of .....rupees for any material breach of this Agreement and further undertakes to pay such sum of .....rupees as determined by NBA as the loss incurred by the Republic of India or the stake holders involved.

8. Confidentiality

8.1 The NBA agrees to treat as confidential any and all Confidential Information obtained from ABC marked as "CONFIDENTIAL" and to that end further agrees that information disclosed pursuant to this Agreement relating to the Invention, including efforts to commercialize the Invention, shall be deemed Confidential Information.

8.2 Notwithstanding clause 8.1, Confidential Information may be disclosed to the extent required by any law or regulation or order of any governmental/administrative/judicial authority having jurisdiction over any of the Parties, with appropriate efforts made to maintain confidentiality.

8.3 NBA shall maintain Confidential Information in confidence, for as long as the confidential information does not fall within the Public Domain.

8.4 Notwithstanding anything contained in this clause, the NBA shall not be restricted to make any disclosure of any confidential information, if in its reasonable opinion such disclosures become important to deal with any emergency situations.

9. Term and Termination

9.1 This Agreement shall remain in force until the IPR is granted to ABC by the Appropriate Authority.

9.2 All clauses that ensure the flow of benefit sharing to the stakeholders in India will survive the termination of this Agreement and will remain in force until such time the IPR granted by the Appropriate Authority stands valid.

10. Notice

10.1 Wherever in this Agreement, it is required or permitted that a communication, notice or demand be given or served by either Party to or on the other Party, such communication, notice or demand will be in writing and will be validly given or sufficiently communicated if forwarded by Registered mail acknowledgement due, e-mail, telegram, telex or facsimile as follows:

The addresses for delivery are:

To the NBA:

The Chairperson, National Biodiversity Authority, 475, 9th South Cross Street, Kapaleeswarar Nagar, Neelangarai, Chennai – 600041

e-mail:nba_india@vsnl.net Fax:91 +44 24491390

To ABC:

.....

10.2 Notice will be deemed to have been delivered:

a) if delivered by hand, upon receipt;

b) if sent by electronic transmission, 48 hours after the time of transmission, excluding from the calculation weekends and public holidays;

c) if sent by certified mail, four (4) days after the mailing thereof, provided that if there is a postal strike or other disruption such notice will be delivered by hand or electronic transmission.

10.3 The Parties may change their respective addresses for delivery by delivering notice of change as provided in this paragraph.

11. Arbitration

11.1 If any controversy, question, dispute or difference (hereinafter referred to as a '**Dispute**') between the Parties hereto arises under this Agreement, any Party may give the other Party a written notice of Dispute adequately identifying and providing details of the Dispute. On receipt of such notice by the other Party, the Parties shall try to settle the Dispute amicably between them by negotiating in good faith within 30 days of the receipt of the notice of Dispute by the other Party.

11.2 If the Dispute is not resolved by such good faith negotiation within the period mentioned, the Parties agree to settle the Dispute through arbitration conducted by the sole arbitrator appointed by the NBA. The arbitration shall be governed by the Arbitration and Conciliation Act, 1996. The place of arbitration shall be Chennai, India. The language to be used in the arbitration proceedings shall be in English or as mutually agreed between the Parties.

11.3 The Parties hereto agree that the award and determination of the arbitrator shall be final and binding on both Parties hereto.

12. Governing Law and Jurisdiction

This Agreement is governed by and is to be construed in accordance with the laws of the Republic of India without regard for conflicts of laws principles. The Parties irrevocably and unconditionally submits to the exclusive jurisdiction of the courts in Chennai, India and any courts which have jurisdiction to hear appeals from any of those courts and waives any right to object to any proceedings being brought in those courts.

13. Waiver

The Waiver by NBA, of any breach of any terms of this Agreement made by ABC shall not prevent the subsequent enforcement of that term and shall not be deemed a waiver of any subsequent breach.

14. Severability

If any part of this Agreement is declared or held invalid by a court for any reason, the invalidity of that part will not affect the validity of the remainder which will continue in full force and effect and be construed as if the Agreement had been executed without the invalid portion.

15. Modification

No amendment or modification of this Agreement shall be valid or binding upon the Parties, unless agreed upon by both Parties, made in writing, and signed on behalf of each of the Parties by their duly and legally authorized representative officers.

16. Entire Agreement

The Parties acknowledge that there are no representations either oral or written, as regards the subject matter of this Agreement, between the NBA and ABC other than those expressly set out in this Agreement. All previous negotiations, understandings, representations, warranties, memoranda or commitments concerning the subject matter of this Agreement are merged in and superseded by this document and are of no effect. This Agreement constitutes the entire understanding between the parties as to the subject matter of this Agreement. This Agreement sets forth all representations forming part of or in any way affecting or relating to the subject matter of this Agreement.

17. Representations

Either Party represent to each other Party that it has the legal right and power to enter into this Agreement and to perform its obligations under the terms of this Agreement and the execution, delivery and performance of this Agreement by it has been duly and validly authorized by all necessary corporate action or Government action on its part.

The documents attached hereto as Schedules forms an integral part of this Agreement as fully as if it were set forth herein *in extenso*, and consists of:

Schedule A : Details of the Biological Resources

Schedule B : Details of the Invention

Schedule C : Details of the territories where intellectual property rights over the Invention are sought to be taken.

Schedule D : Application made by ABC in Form III

and any other Appendix that may be added subsequently under the provisions of this Agreement.

This Agreement has been executed in Duplicate. Each of which shall be deemed to be an original, but all of which together shall constitute one and the same instrument.

IN WITNESS WHEREOF this Agreement has been executed by duly authorized representatives of the Parties on the day and the year first mentioned

For National Biodiversity Authority: For ABC:

Witness

1 1.

2. 2.

Schedule A

Details of the Biological Resources

[To be filled in by ABC]

Schedule B

Details of the Invention

[To be filled in by ABC]

Schedule C

Details of the territories where IPR's over the Invention is sought to be taken.

[To be filled in by ABC]

MPDD/IGNOU/P.O.1K/March, 2017 (Reprint)

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