Intellectual Property Policy for Universities & Research Institutes and Economic Development: The Egyptian Case•

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ABSTRACT

This paper addresses the importance of adopting IPRs policy by universities and research institutes in Egypt to drive up economic growth and development. Therefore, a survey has been taken to diagnose the IP commercialization in the public universities and research institutes in Egypt especially after entering IP law number 82 in 2002 into force. It gets started by clarifying the relative importance of IPRs policy for universities and research institutes based on the successful experiences in the developed countries. Moreover, it analyzed the enforcement and administrative challenges and the status quo of IP protection in Egypt. The survey reveals that there is no clear IPRs policy or even IP management office in the Egyptian universities and research institutes. At the same time, there are some individual quasi IPRs policies in some institutions. Therefore, they have to get the steps towards establishing central IP management office in each institution taking the lesson learned from the developed countries. Also, the Egyptian Supreme Council for Universities and Academy for scientific research and technology have to constitute a committee to design a suitable IPRs policy for the public universities and research institutes considering its private nature per each.

Keywords Intellectual property rights; universities and research institutes; survey; commercialization; enforcement; science and technology.

I. Introduction

The last decades of the twentieth century have seen extraordinary developments in the fields of science and technology S&T. The same period has also seen a rapid increase in the perception of the importance of intellectual property rights IPRs, a term including patents for inventions, protection for industrial designs, and copyright. These changes have important implications for those charged with responsibility for formulating S&T policy. S&T polices are vital aspects of public policy for several reasons. The welfare of the population may be affected by these

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policies, with impacts on economic well-being. In addition, public authorities are responsible for setting the regulatory framework in which research is carried out, including IPRs. However, increasing emphasis is being given to IPRs in the context of international trade negotiations, and wave of the knowledge-based economy.

For the purposes of S&T policy, the most significant of these rights are patents, copyright, and trade secret protection. Other rights play a very important role in innovation and recovering technology investments. Trademarks can extend the period of market domination conferred by a patent, and industrial designs may be crucial in the successful commercialization of innovations protected by patents.

IPRs can provide a monopoly limited in time on a specific technical solution to a problem, although this does not prevent competitors from inventing around the patent and developing an alternative solution. Patents may encourage research and development R&D which is aimed at overcoming existing IPRs owned by others. Inventions, and their associated IPRs, are not valuable in themselves, or to society, until they are used. This is one reason for the important distinction between 'invention' of new techniques, and 'innovation', the first time an invention is employed commercially.

IPRs allow the investments of time, money devoted to R&D to be recovered by protecting commercial sales of products and services embodying IPRs, thus encouraging inventive and innovative efforts by individuals and institutions. They are intended to prevent 'free riders' from benefiting from the expensive process of R&D at little or no cost to themselves, thus reducing the incentives for investment in R&D. Generally speaking, IPRs represent a trade-off between the interests of inventors and those of society, intended to achieve a socially advantageous rate of innovation and progress.

The structure of the global IPRs regime has become increasingly many-sided, and includes a variety of multilateral agreements, international organizations, regional conventions and instruments, and bilateral arrangements. Of these, the agreements that affect the greatest number of countries are the Trade-Related Aspects of Intellectual Property Rights TRIPS Agreement, and some of the multilateral treaties administered by the World Intellectual Property Organization WIPO.[1]

The debate over the relationship between IPRs and economic development was engaged by entering the TRIPS Agreement into force, which for the first time placed IPRs obligations on developing countries. Some IPRs critics believe that a strong IPRs regime may reduce developing countries' access to technology from developed countries by imposing higher fees for technology licenses and production right. Others claim that IPRs promote technology transfer through increased trade, foreign direct investment FDI, and licensing in the long-run by making a country more attractive to foreign partners. A 2002 OECD study concluded that stronger IPRs laws, particularly enhanced patent standards, may be associated with increased FDI and trade for developing countries over time, with variation by industries and level of development (OECD, 2003, p.21).

For instance, India experienced an increase in FDI and technology transfer once it expanded its patent protection. In the contrary, China has a weak IPRs regime but high FDI and trade levels. There is also evidence that IPR's impact on developing countries may vary according to the level of development. One study suggests that IPRs protection may offer more benefits for the more industrialized developing countries, such as Brazil and India, compared to other developing countries. Such industrializing economies could experience economic growth of as much as 0.5% annually through increased trade, FDI, and licensing (Maskus, 2000). Another study

concludes that fast economic growth is coupled with weak IPRs regimes, but that developing countries with higher levels of per capita income may benefit economically from stronger IPRs regimes (CIPR, 2002).

IPRs supporters argue that strong IPRs are serious to creating incentives for pharmaceutical innovations and suggest that reduced prices are no guarantee that needed goods will make it into the hands of individuals in developing countries due to corruption, poverty, and poor social infrastructure.

This paper addresses the importance of adopting IPRs policy by universities and research institutes (as key players are responsible for inventions and creations) in Egypt to drive up economic growth and development. Therefore, a survey will be taken to diagnose the IP commercialization in the public universities and research institutes in Egypt especially after entering IP law into force in 2002. The remainder of this paper is organized as follows: Section II provides the relative importance of IPRs policy for universities and research institutes based on the successful experiences in the developed countries. The enforcement and administrative challenges are analyzed in section III. In section IV, the status quo of IP protection in Egypt is described with reference to a successful experience in IP management in biotechnology field. Data, methodology and results of survey are found in section V. Finally, Section VI summarizes the results and policy implications.

II. IPRs Policy for Universities and Research Institutes

Most universities and research institutes in developing countries are currently faced with several challenges. These include the following amongst many others: There is insufficient funding of education and research activities by various governments. Moreover, most universities and research institutes at this time do not generate much income from self-resources to supplement government funding. This unavailability of adequate funds has caused universities to find it difficult to achieve their missions sufficiently. Consequently, the contribution of universities and research institutes to development is insignificant. The links between research institutes and industry in most developing countries are weak compared with those encountered in developed countries and even in some Asian and Latin American countries (WIPO, 1999).[2]

The IPRs system is useful to universities and research institutes first as a source of information from where further knowledge can be created and can be used to plan for additional researches in the area of concern. Secondly, it can be viewed as a source for products and services when their commercial exploitation is used for economic gains. The IPRs system will benefit these institutions since they have missions of providing education, knowledge creation and support of the development of domestic industry and commerce (WPIS, 1999).[3]

The ability to protect IPRs raises a likelihood of public institutes to increase the source of funds, as well as provide incentives to researchers in order to produce innovations. The changes in IPRs protection laws means also changes the roles of the public and private sectors with regard to the funding, research focal point, and spreading of research's results. It has created new opportunities and challenges for research partnership between the public and private sectors. The public-private sector partnerships in agricultural research for instance are taking many new forms (Lesser et al. 2000). The private sector should play the main role in increasing R&D expenditures. More than two thirds of the R&D expenditure in the European Union EU and the USA comes from the business enterprise sector.[4]

In the USA, the private sector covers close to 68 percent of R&D, but implements about 75 percent, since some publicly funded projects are implemented by private contractors. Internationally the figure has gone up from about 30 percent 15 years ago to about 62 percent presently. This considerable expansion has placed a premium on marketable outcomes and patenting or other forms of IPRs (The Egyptian Competitiveness Report, 2006, p.88). On the other hand, leaving public sector's work to the market would result in an under-investment in research from the perspective of social costs and benefits. Consequently, public intervention in R&D and innovation is necessary to overcome on this problem. The resulting knowledge should be freely available, without the protection of formal IPRs. Downstream work is motivated by the prospect of commercial advantage, and is carried out in private research laboratories (ETAN, 1999, p.7).

The national and international public research institutes in developing countries are also partnering with the public and private sectors in developed countries (e.g., Brazil and USDA collaborative program, Egypt's Agricultural Genetic Engineering Research Institute AGERI and Michigan State University collaborative program, partnership between AGERI and Pioneer Hi-Bred International) (Lewis 2000). These partnerships have raised issues for both the public and private sectors. For the private sector the issue is one of maintaining control on the outcomes of the partnership and recovering investments. For the public sector, the issue is that of performing the public sector mission. Stronger IPRs regime is affecting the mission of public research in several ways. Lesser et al. (2000, p.16) note the following impacts of IPRs on public sector research:

- It discourages the practice of "open science" since the opportunity to patent a discovery is lost when it is publicly discovered (the novelty criteria). A research contract with a private institution also acts as a limitation in the publication of results.
- It gives an institution control over the use of employee's or researcher's innovations, including the right to grant exclusive licenses.
- It restricts the ability of the researcher to further the commercialization process of a product that was developed using materials provided under a research Material Transfer Agreements MTAs.
- The broadened scope of IPRs in the area of plants and agriculture means that a scientist's research using patented tools could be infringing IPRs and could lead to possible legal action.

There are many factors determine the decision about whether or not to protect a particular technology developed by a public research institute. Figure 1 in the appendix lists some of these factors and considers on how they may affect the decision of a public institute about seeking protection. By the nature, the economic variables represent one of the main determinants of protection either in public or private institute. These include the economic cost and benefits of protection. These are influenced by the expected rate of royalty payments from licensing the technology and the direct costs to the institute of seeking protection. The expected rate of royalty payments will be determined by the economics and marketing factors of the technology and the product to be developed, such as the size of the market, competition, and capital investment needed to exploit the protected technology (Maredia, K.M., 2001, p.44).

There is no doubt that Egypt should be able to set up much higher quality R&D facilities than are currently available, and that its R&D efforts in all aspects of

S&T need to be directed to areas of high impact on the economic development. It is important to consider that there is disconnect between the educational and research sector and industry in Egypt and the external world. For appropriate technology transfer to actually occur at a scale well-matched with Egypt's needs, it is essential that industry play a crucial role in the design and management of facilities that would undertake R&D for S&T in Egypt. (The Egyptian Competitiveness Report, 2006, p.89).

III. National Enforcement and Challenges

The enforcement of IPRs Laws considers a pivot issue in TRIPS agreement. With respect to the general enforcement obligations, procedures must be available that 'permit effective action against any act of infringement of IPRs'.[5] They must be fair, equitable and not unnecessarily complicated, costly or time-consuming.[6] The judicial authorities must be granted the power to require infringers to pay damages adequate to compensate the right holder for the injury suffered due to the infringement.[7] Members are required to provide for criminal procedures and penalties 'at least in cases of willful trademark counterfeiting or copyright piracy on a commercial scale'.[8] Remedies may include imprisonment and/or monetary fines. Moreover, TRIPS creates no obligation to shift resources away from the enforcement of law in general towards the enforcement of IPRs. On the other hand, resource-poor countries may face a difficult dilemma when determining how to allocate the scarce resources they have.

The founding and operating of the IPRs infrastructure in developing countries needs a range of both one-time and running costs. One-time costs could include acquisition of office premises; automation (hardware and software) and office equipment; consultancy services (for policy research, the drafting of new legislation, design of automation strategies, management re-organization etc); and training of staff in the relevant agencies dealing with policy/law making, administration and enforcement. Running costs could encompass staff salaries and benefits; charges for utilities; information technology equipment maintenance; communications services (including development of an annual report and website); travel expenses for participation in meetings of the international and regional organizations; and annual contributions to WIPO and regional organizations.

It is not easy to depict general conclusions about the scale of these costs in developing countries, primarily because of different volumes of IPRs applications required to be processed, variances in local labor and accommodation costs, and policy choices that different developing countries make in designing their IPRs infrastructure. For example, costs will be far higher in developing countries that operate substantive patent examination systems, compared to those using a registration system without any examination.

A 1996 study by UNCTAD reported some roughly estimates of the institutional costs of compliance with TRIPS in developing countries.[9] In Chile, additional fixed costs to upgrade the IPRs infrastructure were estimated at $718,000, with annual running costs increasing to $837,000. In Egypt, the fixed costs were estimated at $800,000 with additional annual training costs of around $1 million. Bangladesh anticipated one-time costs of only $250,000 (drafting legislation) and $1.1 million in annual costs for judicial work, equipment and enforcement costs, exclusive of training. The World Bank estimated that a comprehensive upgrade of the IPRs regime in developing countries, including training, could require capital expenditure of $1.5 to 2 million, although evidence from a 1999 survey of relevant

World Bank projects suggested that these costs could be far higher.[10] A report on modernizing Jamaica's IPRs system estimated initial automation costs alone of around $300,000 (Thorpe, P. (2002).

One serious problem needing to be addressed is that many developing countries lack sufficient qualified examiners to handle a high volume of patent applications. Therefore, national patent offices accumulate large backlogs of unexamined applications, especially in the most advanced technological fields. One of the available solutions is to connect with neighboring countries to set up a regional patent system. Another is to carry out only superficial examinations or to go for a registration system without any examinations taking into account low of issues patents' quality. Some solutions refer to accepting search and examination reports from other patent offices.

On the other hand, in most developing countries, IPRs administration agencies charge various fees for services related to processing applications for IPRs and also for renewing those rights once awarded. In some larger developing countries, such fee revenues are significant and far exceed their operating expenditures. In Chile, for example, fee revenues from the administration of industrial property rights amounted to $6 million in 1995, compared to running costs of $1 million in the same period. In developed countries, IP offices often earn substantial surpluses, normally contributing significant sums to national treasuries. As far as other developing countries, for example, IPRs fees revenues for the 1999/2000 financial year were $2.5million in India, $629,000 in Kenya, $230,000 in Trinidad, $214,000 in Tanzania and $162,000 in Jamaica. Fees revenues from trademark administration are the largest single source of return as the granting of patents and other IPRs produces much lower revenues by comparison. This is especially true in low income developing countries. There is no doubt that the critical financial issue clearly seems in the inequality between revenues and costs. It appears barely desirable that developing countries should divert its scarce resources towards spending on the administration of IPRs. However, Jamaica's IP office appears to be presently operating at a loss (about $120,000 in the 1999/2000 financial year) so requiring a subsidy from Jamaica's taxpayers.[11]

Most developing countries, Egypt one of them will probably need to structure their capital investment programs for IPRs in stages and ensure that the service fees are set at a level where the full range of financial costs incurred in the IPRs system are recovered. These issues require a rigorous financial management and accounting systems and fees to be reviewed on a regular basis. A number of countries have adopted a tiered-system of charges, where reduced fees are charged to non-profit organizations, individuals and small commercial organizations against high fees for the rest, especially for applicants from developed countries. On one hand, this system will provide a means of developing the national IPRs infrastructure and delivering improved services for users, without placing additional burdens on public finances. On the other hand, a policy of charging higher fees to applicants from developed countries may be inconsistent with the principle of national treatment required under the Paris Convention and TRIPS taking into consideration that the majority of patent applications in most developing countries are from citizens of developed countries. The level of charges to users of IPRs system should be regularly reviewed to guarantee that developing country enables full recovery of the costs of administering the system.

Effective enforcement of IPRs is a positive function in income levels. For example, in Tanzania and Uganda there is little evidence of cases involving IPRs infringement proceeding through the judicial system, whilst in Kenya, in 2000, the

customs authorities have made 50 seizures of counterfeit goods and 20 IPR-related criminal cases have been brought before the courts (Drahos, P., 2001). Some developing countries, such as Thailand and China, have established specialized courts to hear IPR-related cases as a means of improving their capacities for national enforcement, though such a measure is not formally required under TRIPS. A more attractive approach for developing countries is probably to establish (or strengthen) a commercial or economical court, which may hear IPR-related cases *inter alia* and provide improved access to justice for the business sector as a whole. In Egypt, the economic courts entered into force in 2009. By the way, a substantial program of training for the judiciary and other enforcement agencies in IPRs subjects will be required as can be seen in Egypt.[12]

Based on the private nature of IPRs, it is necessary to solve the disputes between parties either out of court or under civil law. Indeed, as state enforcement of IPRs is a resource-intensive activity, there is a strong case for developing countries to adopt IPRs legislation that emphasizes enforcement through a civil rather than a criminal justice system. This already would reduce the enforcement burden on the government in the case of counterfeiting on a large scale, although the state enforcement agencies would still be required to intervene. That said, we note that developing countries have come under pressure from industry which advocates enforcement regimes based on state initiatives for the prosecution of infringements. Such pressures should be resisted, and right owners assume the initiative and costs of enforcing their private rights. Developing countries should ensure that their IPRs legislation and procedures emphasize, to the maximum possible extent, enforcement of IPRs through administrative action and through the civil rather than criminal justice system. Enforcement procedures should be fair and equitable to both parties and ensure that injunctions and other measures are not used excessively by IPRs holders to block legitimate competition.

IV. IPRs Protection in Egypt: Status Quo

Egypt strengthened its IPRs regime through improvements in its domestic legal framework and enforcement capabilities. Egypt also passed a comprehensive IPRs law in 2002 to protect IPRs and designed to bring the country into compliance with its obligations under the WTO Agreement on TRIPS. The adequacy of Egypt's protection IPRs of U.S. and foreign pharmaceutical institutions, however, continues to raise concerns. The USA was encouraged by the Egyptian government's announcement in January 2007 of a new 120 day streamlined drug registration system for drugs carrying a U.S. FDA[13] or European approval. Until now, this system does not yet enter into force.

Regarding patents, The Egyptian government has made progress in establishing and strengthening some governmental institutions necessary for protecting IPRs. Provisions of the new IPRs Law allowing for patenting pharmaceutical products took effect on January 1, 2005, when the Egyptian Patent Office EGPO opened the mailbox for pharmaceutical patent applications. The EGPO then began examining the approximately 1,500 pharmaceutical patent applications submitted for approval. In March 2007, the EGPO granted its first pharmaceutical product patent from the "mailbox". According to the EGPO, it has completed its technical examination of all filed applications. However, further clarity is needed regarding the actual disposition of all applications filed in the mailbox and the status of notifications to patent holders.

Egypt's patent laws continue to lack adequate and effective protection for a wide range of technologies that are important to the Biotechnology Industry Organization BIO Members. In that light, BIO requests that Egypt be maintained in its current status on the Priority Watch List.[14] The Egyptian patent law prohibits patent protection for many innovations. Inventions in the subject matter areas of organs, tissues, viable cells, natural biologic substances, and genome are expressly excluded from patentability. These are areas of subject matter that should be extended protection according to the obligations contained TRIPS Agreement.

In addition, Egypt precludes the patenting of genetically engineered plants and animals. In sum, the Egyptian law avoids patenting of most basic commercial products and processes in the biotechnology industry as BIO see. Further, Egypt still does not provide for adequate and effective protection of data supplied to regulatory agencies in support of product marketing authorizations. Data protection is critical for biopharmaceutical institutions that want to market products in a particular country. This lack of protection is not consistent with Egypt's obligations under the TRIPS Agreement Article 39.3. BIO requests that United States Trade Representative USTR continue to engage Egyptian counterparts in order to make improvements to the protection of IPRs in Egypt and to provide for the eventual adoption of a fully TRIPS-compliant regime in that country.

As far as copyrights, High levels of piracy adversely impact most copyright industries in Egypt, including movies, sound recordings, books and computer software. The government has improved protection of computer software and has taken steps to guarantee that civilian government departments and schools use legitimate software. However, the International Intellectual Property Alliance estimated piracy rates in the Egyptian market for business software at 60 percent and music at 75 percent in 2007. Book piracy remains a particular concern in Egypt, due to weak enforcement in this area.

Although the Ministry of Culture had taken the lead in enforcement of exclusive rights for software, copyright regulations issued in 2006 appear to give the Information Technology Industry Development Agency ITIDA under the Ministry of Communications and Information Technology the lead on copyright law enforcement for software and databases. Technical expertise in ITIDA is expected to improve enforcement for software in Egypt. ITIDA has conducted IPRs public awareness events with local partners and provided expert opinions in judicial matters relating to IPRs infringement for software products.

Digital libraries of S&T can bring knowledge to virtually everyone, everywhere. Scientists and technologists in developing countries, including Egypt, have limited access to recent research findings (mostly in journals), to reference materials (mostly in libraries elsewhere), and to databases (some of which are proprietary); and these problems have been worsen in the last decade. The massive advances in information and communications technology ICT have opened up opportunities for remedying the situation as never before, though these same advances have also raised issues of IPRs. The proper exploiting of digital technologies is essential to S&T capacity-building in Egypt to provide adequate ICT infrastructure and trained technical personnel for their learning and research institutions. The new Library of Alexandria is making distinctive efforts in this direction, but it is clearly a small part of what must become a vast regional and global enterprise (The Egyptian Competitiveness Report, 2006, p.89).

The government has pursued an open-minded policy to encourage dissemination of the internet into Egypt, providing multiple toll-free numbers to offer

heavily subsidized dial-up access to the internet. The number of subscribers to the internet has gone from only 75,000 Egyptians in 1998 to some five million in 2006. This helps lay the foundations for a much greater interaction with the new digital materials of the 21st century. More needs to be done in this area, in particular in production and accessibility of Arabic digital content (Ibid, p.89).

An important study shows that the state governmental institutions in Egypt ignored the role of musical education in promoting, protecting and preserving the cultural musical heritage of Egypt. However, the students' musical experience is limited to simplistic, patriotic/popular songs in inauthentic major and minor keys, performed on the piano or an electric keyboard, thus eliminating Arabic melodic and rhythmic modes and Arabic music instruments. Once a generation has arisen in Egypt that has an understanding and appreciation of its own musical heritage, and does not merely continue an inferiority complex disguised with Western misspelled language, the need for a type of IPRs and policies that is inspired by Arabic cultural characteristics will be recognized. It will extend beyond an imitation of policies that have mainly served the issues of IPRs within the Western cultural model. Therefore, the study suggested designing an educational curriculum and creating media programs for children and youth in order to motivate students (of different ages and levels of education) to respect, protect and be able to contribute to the Egyptian musical heritage. It should be emphasized in this curriculum that this material is to be learned as a study of the cultural expressions as a source of creativity and innovation. It should be considered as a part of a human musical heritage (Madian, 2006).

In addition, there is an excellent experience in the biotechnology research. AGERI is the main focal point for biotechnology research. It is a part of the Agricultural Research Center (ARC) in the Ministry of Agriculture. It actively works with other universities in Egypt and is recognized as a center of excellence in agricultural biotechnology research not only in Egypt but also in the Middle East. To help address the IPRs management issues, AGERI has recently established an Intellectual Property and Technology Transfer Office. This office serves the scientific community in AGERI and other institutions in ARC. The office currently has a technology transfer coordinator and an administrative support staff. The office, though in its infancy, has made significant progress in IPRs policy and management. It has developed IPRs policy for AGERI. The office is also very active in creating awareness and education of ARC scientists in various aspects of IPRs as they relate to agriculture. Moreover, it will play a key role in the development of MTAs, and licensing of technologies generated in AGERI and ARC. In the same time, it develops educational materials on IPRs management for scientists in Arabic and English languages. Finally, it will serve as a link with the private and public sector in Egypt and abroad (Maredia, K.M., 2001, p.27).

V. The Survey: Methodology and Analysis

The study based on the questionnaire designed by the Statistics Canada commissioned, The Association of Universities and Colleges of Canada (AUCC), The Association of University Technology Managers (AUTM) and Industry Canada. The Canada's questionnaire considers one of the most common and comprehensive questionnaires in IPRs. Due to the private nature of the Egyptian environment, there are some modification has been taken in the questionnaire. The target population is the public Egyptian universities and research institutes taking into account that the private universities still in its early stages. Data are collected directly from the survey

respondents for all the units of the target population for 2007/2008, therefore, no sampling is done. The survey is mailed to Vice- President of the University for Research & post-graduates and Directors of the research institutes. There are some workshops, seminars and meeting has been organized by the Strategic Planning Unit at the Ministry of Higher Education to explain and clarify the objective and how to complete the questionnaire. This is because of awareness's lack of IPRs in the Egyptian universities and research institutes. Responding to this survey is voluntary. For error detection, internal inconsistencies are followed by telephone. The Survey is subject to certain types of error: coverage, non-response, interpretations and processing errors. It mailed out to 16 universities (consists of 219 affiliated faculties or schools) and 10 research institutes which means that the total number of institutions is 229. The response rate was 62% which considers reasonable especially it represents the first time to undertake a survey on IPRs in Egypt (See: table 1).

Table 1: Response rate

Type of response	Total number	%
Completed or largely completed	141	62
Total refusal	88	38
Total	**229**	**100**

VI. Results and Policy Implications

Concerning IPRs management which defined as the identifications, protection, promotion and commercialization of IPRs, unfortunately, there is no either university or research institute have IPRs management office. However, two universities and one research institute reported that they get steps to establish IPRs office. These words do not mean that there is no IPRs management activity in the Egyptian universities and research institute. The evidence will be cleared in the following. The respondent's institutions reported a number of technology transfer personnel. The fields of study included commerce, law, sciences, applied sciences and engineering. Fifty-five percent out of the number reported had B.Sc, M.Sc, Ph.D. 9% listed had B.Sc, M.Sc, M.B.A, while 10% listed had B. Com. (Table 2).

Table 2: Degree of technology transfer personnel

Degree	No. of personnel	%
(B.Com)	10	10
(B.Eng.)	9	9
other B.	6	6
other M.	8	8
B.Sc, M.Sc., M.B.A	9	9
Ph.D.	3	3
B.Sc., M.Sc., Ph.D.	57	55
Other+Ph.D	2	2
Total	**104**	**100**

By moving to the years of experience of technology transfer personnel, it can be shown that from one to fourteen, fifty one percent of technology transfer personnel had fewer than five years of experience in that field. This result can be explained by the relative newness of the IPRs issue in Egypt. (Table 3).

Table 3: Years of experience of technology transfer personnel

Number of years	No. of personnel	%
1-2 yrs	12	15%
3-4 yrs	29	36%
5-9 yrs	34	42%
10-14 yrs	6	7%
Total	**81**	**100%**

With respect to the researcher requirement to report IPRs, Table 4 shows that 81 out of 141 institutions stated that they have not IPRs policy, while only 29 institutions reported that they have IPRs policy. Due to the newness of IP culture in the Egyptian universities and research institutes, these results consider normal. At the same time, there are some individual's trials to adopt criteria in IPRs based on the articles of the Egyptian law No. 82 in 2002, but it still immature to become identified IPRs policy. On the other hand, there are 53 institutions reported that they have IPRs policy to some extent in educational materials field versus 17 institutions in trade-marks.

Table 4: Researcher requirement to report IP 2007/2008

		The institution's polices state:			No policy on reporting	No such IP at the institution	Total
		Always	Sometimes	Never			
		No. of institutions					
Inventions		1	27	1	81	31	141
IP protected by copyright	**Software or databases**	2	36	0	58	45	141
	Educational materials	2	51	0	43	45	141
	Other materials	1	18	0	89	33	141
Industrial designs		1	48	0	58	34	141
Trade- marks		1	16	0	74	50	141
New plant varieties		1	37	1	68	34	141

For the question on ownership of IPRs created at the universities and research institutes, it seems clearly no policy concerning the ownership. Generally speaking, all the institutions have not any policy except for small number e.g., 12 institutions in the field of software and databases versus 34 institutions in educational material's field. (Table 5). The result of educational materials considers logic taking into account that 27 institutions said that researchers only own their IPRs versus nothing in the

field of software which the institutions stated that the researcher join its institution in the ownership of IPRs.

Table 5: Ownership of IP created at the institutions: 2007/2008

	Institution owns	Researcher owns	Joint ownership (institutions and researcher)	No policy on ownership	Other ownership	No such IP at the institution	Total
	No. of institutions						
Inventions	1	0	5	134	1	0	141
Software or databases	2	0	10	128	1	0	141
Educational materials	1	27	6	106	1	0	141
Other materials	2	2	6	131	0	0	141
Industrial designs	1	10	17	112	1	0	141
Trade- marks	1	0	6	133	1	0	141
New plant varieties	1	0	6	133	1	0	141

In most universities and research institutes, there is no any idea on commercialization of IPRs (62%), while only 23% stated that the researchers have the right to decide that their inventions will not be commercialized, especially in the research institutes. Due to no clear IPRs policy considering commercialization of IPRs as one of its main components, the results of the survey in this point can be accepted. (Table 6).

Table 6: Researcher right to decide that their inventions will be not commercialized

Right to commercialize	No. of institutions	%
Yes - researchers have this right	32	23%
No	22	16%
Not applicable	87	62%
No response	0	0%
No such at the institution	0	0%
Total	**141**	**100%**

Regarding the faculty consulting, about 48% out of the respondents reported that they kept records of faculty consulting activities. The rest ratio distributed between not recorded and no information. Of course, the Egyptian law asked the public universities and research institutes to record the faculty activities. (Table 7).

Table 7: Formal recording of consulting activity

Consulting activity	No. of institutions	%
Yes- recorded	68	48%
No- not recorded	41	29%
No information	32	23%
Total	141	100%

The highest percentages of external faculty consulting were found in engineering, agricultural and biological sciences and health fields. There are 66 institutions in engineering stated that between 26% and 100% of their faculty were consulting, while 64 institutions in agricultural and biological sciences field versus 58 institutions in the health field. (Table 8).

Table 8: Percentage of faculty involved in external consulting by field of study

Field	No such faculty at this institution	0%	1-25%	26-50%	51-75%	76-100%	Not reported	Total
	No. of institutions reporting							
Fine and applied arts, humanities ad social sciences	3	0	50	30	20	1	0	**104**
Educational, recreational and counseling services	0	0	51	32	21	1	0	**105**
Commerce, management and business administration	18	0	57	13	16	0	0	**104**
Agricultural and biological sciences and technologies	2	0	38	48	16	0	0	**104**
Engineering and applied sciences	2	0	27	35	30	1	16	**111**
Health professions, sciences and technologies	3	0	32	14	44	0	16	**109**
Mathematics and physical sciences	1	0	85	22	1	1	0	**110**

To get a clear picture on the relative share of research in the national economy, it is very important to check the number and value of research contracts. Table 9 depicts the current status in the universities and research institutes in Egypt. Number of research contracts was 85 contracts with value LE 32.5 million which seems very modest. This value constitutes a negligible ratio in the Egyptian gross domestic product (GDP) which reflects the necessity of allocation a reasonable ratio of GDP for research taking into consideration that 78% of total value of research contracts comes from the public government. Also, the role of private sector or industry must be considered in this affair. The main types of research contracts were collaborative R&D at LE 19 million and service at LE 12.2 million.

Table 9: Number and value of research contracts

	Number of contracts	Value of contracts (LE thousands)
Public government	49	25639.32
Provincial and other levels of government	1	167.1
Egyptian business	7	4450.305
Egyptian organizations	19	2115.235
Foreign government	3	173.85
Foreign organizations	6	34.256
Total	85	32580.07

Table 10: Research contracts by type

Type of research contract	No. reporting	Value of contracts (LE thousands)
Service contracts	3	12155.76
Collaborative R&D	2	19000
Sponsored research contracts	1	200
Sponsored Value	1	575
Total	**7**	**31930.76**

Concerning patenting activities in 2007/2008, the number of patent applications is 34, 16 patents issued in Egypt as can be seen in table 11 and there is no any one issued in USA and European countries due to the cost factor. All the respondents did not deliver any answer concerning commercialization or exploitation of IPRs in different forms (patents, copyrights..etc). Or in other words, no feedback about the amount of licenses, income from IPRs (e.g., royalties) and new companies established in technology (Spin-off companies). Therefore, data only on patenting activities does not consider a sufficient indicator to give a good idea on the impact of these activities on the economic development in Egypt.

Table 11: Patenting activities by field of study

Field of study	Patent applications				Patents issued in:			
	Initiating	Follow-up	Unallocated by type	Total	Egypt	USA	Other	Total
Number								
Agricultural and biological sciences	3	4	0	7	7	0	0	7
Engineering and applied sciences	5	17	0	22	4	0	0	4
Health professions and sciences	2	1	0	3	3	0	0	3
Mathematics and physical sciences	2	0	0	2	2	0	0	2
Total	**12**	**22**	**0**	**34**	**16**	**0**	**0**	**16**

Consequently, the Egyptian universities and research institutes have to get steps towards establishing central IPRs management offices taking the lesson learned from the developed countries. Also, the Supreme Council for Universities and Academy for scientific research and technology have to constitute a committee to design a suitable IPRs policy considering the private nature of the different institutions. This policy should handles the ownership, protection and commercialization of IPRs and know-how created by researchers, students and employees at the universities and research institutes as well as the interface with others who may fund or collaborate with the university in the creation of IPRs and know-how. It sets out how the rewards from any such commercialization will be shared. Issues not directly considered in this policy, including disagreements concerning its application or interpretation, will be addressed and resolved consistent with applicable law and collective bargaining agreements. In case of a conflict between this policy and the collective bargaining agreements, the bargaining agreements can be prevailed.

References:

Commission on Intellectual Property Rights (CIPR) (2002), *Integrating Intellectual Property Rights and Development Policy*, September.

Drahos, P. (2001), *"Developing Countries and International Intellectual Property Standard-Setting"*, Commission on Intellectual Property Rights Background Paper 8, Commission on Intellectual Property Rights, London, Available at: http://www.iprcommission.org) [Accessed on 2001).

ETAN Group. (1999),"Strategic Dimensions of Intellectual Property Rights in the Context of Dcience and Technology Policy", *ETAN Working Paper*, Final Report, June.

Lesser, W., G Horstkotte-Wesseler, U. Lele and D. Byerlee. (2000), Intellectual Property Rights, Agriculture and the World Bank. In: Uma Lele, William Lesser and Gesa Horstkotte-Wesseler (eds.) *Intellectual Property Rights in Agriculture: The World Bank's role in Assisting Borrower and Member Countries.* Washington, D.C.: The World Bank.

Lewis, J. (2000), Leveraging Partnerships between the Public and Private Sector: Experience of USAID's Agricultural Biotechnology Programs. In: G.J.Persley and M.M. Lantin (eds.) *Agricultural Biotechnology and the Poor. Proceedings of an International Conference, Washington, D.C., 21-22 October 1999.* Washington, D.C.: CGIAR.

Madian, A. (2006), "Intellectual Property Rights (IPRs), Innovation and Sustainable Development" m Bibliotheca Alexandrina UNCTAD / ICTSD / BA Regional Arab Dialogue, 26 – 28 June, Alexandria, Egypt.

Maredia, K.M. (2001), "Application of Intellectual Property Rights in Developing Countries: Implications for Public Policy and Agricultural Research Institutes", Final Draft Submitted to the World Intellectual Property Organization.

Maskus, K.E. (2000), *Intellectual Property Rights in the Global Economy*, Institute for International Economics, Washington, DC, August.

OECD (2003), "The Impact of Trade-Related Intellectual Property Rights on Trade and Foreign Direct Investment in Developing Countries," May 28, Available at (http://www.oecd.org) [Accessed on 2003).

The Egyptian Competitiveness Report 2005-2006, Cairo, May, 2006.

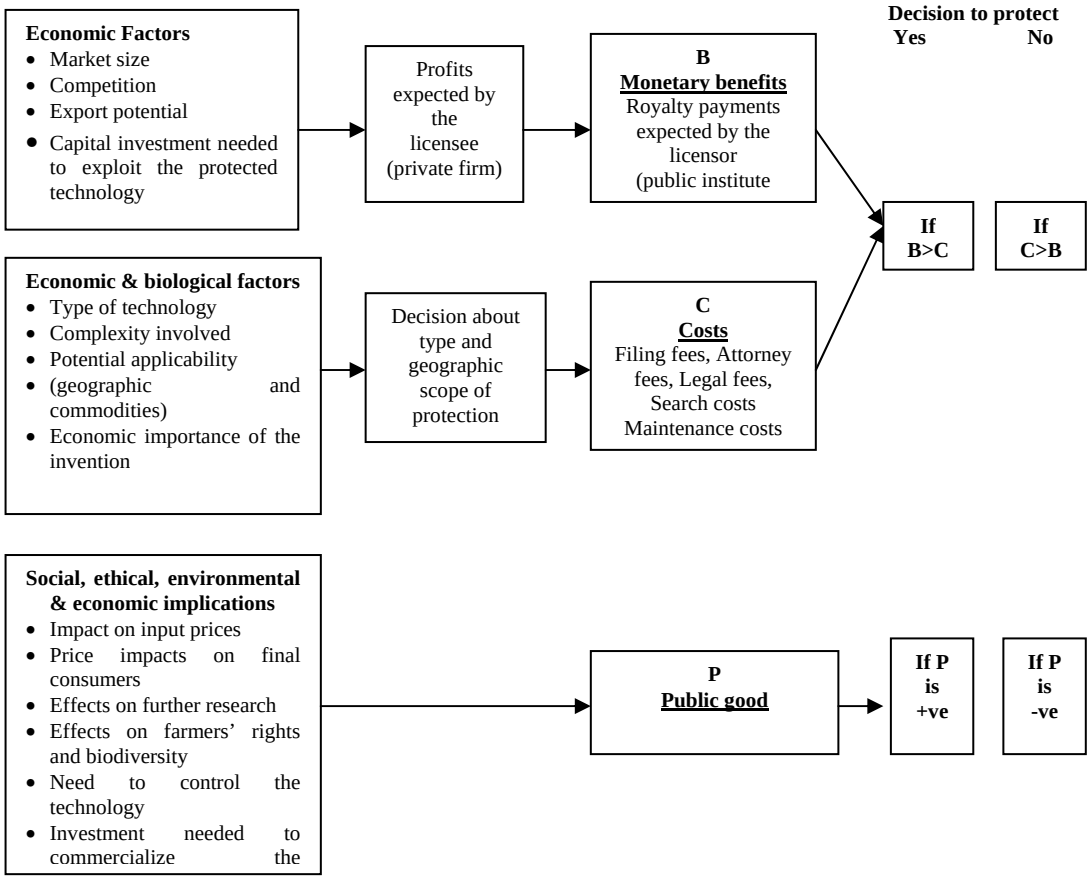
Thorpe, P. (2002) *"The Implementation of the TRIPS Agreement by Developing Countries"*, Commission on Intellectual Property Rights Background Paper 7, Commission on Intellectual Property Rights, London, Available at (http://www.iprcommission.org) [Accessed on 2002).

UNCTAD (1996), *The TRIPS Agreement and developing countries*. UNCTAD Secretariat, New York and Geneva: United Nations.

WIPO (1999), *Guidelines on Developing Intellectual Property Policy for Universities and R&D Organizations*.

Appendix:

Figure 1: Determinants of the IPRs Protection Decisions of a Public Research Institute



Source: Maredia, 2001, p.90.

Endnotes:

[1] Article 3, Convention Establishing the World Intellectual Property Organization. Signed at Stockholm on July 14, 1967.

[2] WIPO, 1999, Guidelines on Developing Intellectual Property Policy for Universities and R&D Organizations.

[3] For example, information obtained from patent documents is useful to:

- Avoid duplication of R&D work;
- Identify specific new ideas and technical solutions, products or processes;
- Identify the state-of-the-art in a specific technological field in order to be aware of the latest development;
- Assess and evaluate specific technology and to identify possible licensors;
- Identify alternative technology and its sources;
- Locate sources of know-how in a specific field of technology or in a given country;
- Improve an existing product or process;
- Develop new technical solutions, products or processes,
- Identify existing or prospective industrial property rights (validity, ownership,...), particularly to avoid infringement actions;
- Assess novelty and patentability of own developments with a view of applying for a domestic or foreign industrial property right;
- Monitor activities of competitors both within the country and aboard; and
- Identify a market niche or to discover new trends in technology or product development at an early stage.

See: WIPO Patent Information Services for Developing Countries (WPIS), WIPO Regional Seminar on Invention and Innovation in Africa, Abidjan, September 1-3, 1999.

[4] Eurostat.

[5] Article 41.1.

[6] Article 41.2.

[7] Article 45.1.

[8] Article 61.

[9] Bhagwati, J. (2000) *"What It Will Take to Get Developing Countries into a New Round of Multilateral Trade Negotiations"*, Columbia University, New York, p.21. Source: http://www.dfait-maeci.gc.ca/eet/02-e.pdf.

[10] For example, Correa, C. (2000) "Intellectual Property Rights, the WTO and Developing Countries: the TRIPS Agreement and Policy Options", Zed Books, New York & Third World Network, Penang.

[11] Source: http://www.wipo.int/cfdiplaw/en/trips/index.htm

[12] Source: http://waysandmeans.house.gov.

[13] Food and Drug Association

[14] Intellectual property rights are the foundation of the biotechnology industry. BIO Members depend on obtaining patents and related rights in a timely and predictable manner, and the ability to enforce those patents is critical. Biotechnology is also a uniquely global enterprise. If a country's patent system or the political structure for enforcing patent rights is ineffective, a competitor can use an invention with impunity, depriving the patent owner of the economic value of the invention. BIO Members have a particular interest in encouraging uniform and robust intellectual property protection in all countries and regions of the world.