

The Role of Intellectual Property System in Innovations in Developing Countries

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Abstract

The paper reviews the potential of patent documentation in its contribution to the business and technological development. Further more the paper examines the current initiatives in Tanzania to promote utilization of patent documentation for innovations, technological development and hence poverty reduction. Intellectual property rights particularly patenting has two major functions. One is the “monopoly function”, which encourages creativity and innovations and the other is the “information function” which adds knowledge and contributes to promotion of further creativity and innovation. Information is power and is the source of knowledge, which is an essential tool in decision making. One of the major sources of technological information is the patent documents. There are over fifty million patent documents worldwide with a lot of technological information which could be used for innovation purposes. Unfortunately in less developed countries patent information is not yet fully utilized, Tanzania being among them. In Tanzania patent documentation is not mostly used, this could be attributed due to the lack of intellectual property rights awareness and awareness of the existence of the patent information among the potential users. It therefore necessitates the need for making efforts to create this awareness among scientists, technologists, inventors, innovators and the general public. It is therefore recommended that universities, R&D institutions and firms should consult patent documentation in their R&D activities. The country should also formulate policies and strategies to make effective use of patent documentation for its economic growth.

Keyword: intellectual property, innovation, patents, patent documentation, poverty reduction, Tanzania

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1.0 INTRODUCTION

1.1 Background

Science and technology have been recognized worldwide as important components for social-economic development. Through innovations new solutions to technical problems have been found and improved the well being of the human kind. Generally, we can say that an 'innovation' is developing a new idea and putting it into practice. Technological innovation may be classified in several ways: product vs. process, radical (basic or fundamental) vs. incremental (improvement), and disruptive vs. sustaining (sequential and/or complementary) (Kalanje, 2006). Other important types of (non-technological) innovations that do not result from scientific and/or technological R&D, but are often crucial for profitably marketing the products and services resulting from the investment made in R&D are: marketing innovation, institutional innovation, and complementary innovation.

Technological development has contributed to improve the welfare of the human kind. Most of the technologies are developed through investment in R&D. One of the incentives to invest in R&D has been the protection of intellectual property. Intellectual Property (IP) refers to types of property those results from creation of human mind "the intellect". There are legal and institutional systems, which are put in place in order to protect the IP owner and these are referred to as Intellectual Property Rights.

According to the Convention establishing the World Intellectual Property Organization (WIPO) intellectual property is defined as including the rights related to (WIPO, 2005): *"Literary, artistic and scientific works; Performance of performing artists, phonograms, and broadcasts; Inventions in all fields of human endeavor; Scientific discoveries; Industrial designs; Trademarks, service marks, and commercial names and designations Protection against unfair competition; and all other rights resulting from intellectual activity in the industrial, scientific, literary or artistic fields"*.

There are two major categories of protection of intellectual property: Copyright and neighboring rights, and the industrial property. These two categories cover different forms of the intellectual property. For the purpose of this paper, patents will be dealt with and the other forms of industrial property and copyright will not be dealt with.

1.2 Patent system

Patents fall under the industrial property category of intellectual property. It is an arrangement between the State and the inventor whereby the State assures the inventor, that no one will copy his invention without his consent after disclosing and publicizing

his invention to the society (Salazar, 1998; Gupta and Rastogi, 2002; Menell, 1999; and Morris et al, 2002).

In finding justification on protection of patents, the connection between innovation and commercialization and thus financial reward must be found. Cameron (2004) urges that justification operates from the premise that little incentive to innovate exists when others reap the rewards from innovation at little or no cost- the classic ‘free-rider’ problem. It asserts that innovative products would not become commercially available unless market exclusivity is guaranteed. This is supported by Morris et al. (2002) stating that in the absence of any form of IP protection, the knowledge associated with knowledge-based goods may be appropriated without payment to its creator. The generation of new knowledge entails high costs while the costs for imitation and copying are typically low (Grabowski and Vernon, 2000; Morris et al, 2002; and Cullet, 2003). This has created a problem in appropriating the results of knowledge creation. Intellectual property system has been created in order to resolve these appropriation problems (Baltodano, 1999; OECD, 2004).

1.3 Patenting process and patent documentation

The patent system has two major functions. One is the “monopoly” function, which encourages creativity and innovations and the other is the “information function”. The information function of the patent system has been very important for the continuous development of technology and innovations (WIPO, 2006). The patent laws demand detailed disclosure of the information about the invention to be protected. This information has and continues to stimulate new research across the world.

The intellectual property creation cycle (Fig.1 appended) starts with the investment in R&D to obtain the invention or innovation. The invention/innovation has to meet three criteria namely: novelty, non-obviousness and industrial applicability in order to be granted a patent. Furthermore, patent laws require that the invention/innovations should be described in details so that a man skilled in the art should come to the same results if he follows the teaching described in the patent document (Kiige, 1999). This is the source of information. For every patent document, there is a lot of technical information contained therein. Through this information, technology and innovations have been driven to the current frontiers. This has been possible through the exclusive rights granted under patent system and technological disclosure contained in the patent documents.

1.4 Characteristic of patent information

Patent documents contain descriptions of scientific and technical concepts as well as practical details of processes and apparatus. Patents generally disclose technological information by describing the inventions in accordance with the requirements of the applicable patent law and by indicating the claimed novelty and inventiveness by reference to the existing state-of-the-art (WIPO, 2006). In this case patent documents are sources of information that furnish a history in summary form, of the technological

progress in the field of technology to which they relate. Patent documents generally have a fairly uniform structure that facilitates the extracting of information.

Patent documents consist of an abstract, description, claims and sometimes drawings. The brief descriptions of these specific characteristics, which make the patent documents extremely useful sources of technological information, with some clear advantages over other sources of information are summarized here below:

Abstracts

A Patent document contains an abstract that allow a general idea to be formed of the contents of the document within a few minutes. This provides an advantage of a quick scanning of the idea contained in the patent document and could enable the reader to make a decision whether the document is relevant or not for his particular need.

Description, Claims, Drawings

Normally, the description gives what was known before the invention, i.e., the "prior art" (i.e. the background to the invention), and defines the difference between the pre-existing technology and what the invention contributes, as a new matter to technology development; often patent documents contain also drawings, that could give illustrations about the invention that is claimed; the claims give the essence of what is new and this is the scope of protection of the particular invention.

1.5 Importance of patent information

It is known that over 80% of all technical information is available only from patent documents. The information contained in patent documents is available to everybody. According to recent WIPO statistics (WIPO, 2006), the number of patent applications filed each year in the world is nearly one and a half million, which result in the grant of more than half a million patents. The number of inventions which are covered by those patent applications and grants is much smaller since each invention may give rise to an average of two or three patent applications in different countries. The number of patent documents published each year, both applications and granted patents, is approximately two million, in many different languages.

It is estimated that there are over 50 million patents documents so far from the beginning of the times when patents were first published though there are no exact statistics available. All this unique collection of technological information is available to the public. It is this treasure of information that can contribute to technological development in developing countries including Tanzania.

Patent information can be used freely or with a fee. Free exploitation is possible under following conditions: beyond the period of protection; outside the territory of protection, if the patent is declared void, and for scientific research.

It is unfortunate that the doctrine of territoriality in the protection of patents is not understood. Most of the people think that if it is patented then one is not allowed at all to see what it is about. This misconception has denied developing countries particularly the sub-Saharan Africa the opportunity to utilize patent documentation for their development objectives.

2.0 POTENTIAL USES OF PATENT INFORMATION

A patent must be the first disclosure of an invention; therefore the details published within the patent document are often not published anywhere else in the world. This makes the patent documentation a key source of technical information. The summarized and elaborated uses of patent information are as described below (Kiighe, 1999):

2.1 Identify business opportunities and alternative technologies

The patent document has a bibliography, which shows the names and addresses of the applicants and inventors. So one could get in touch with the inventors if he/she is interested in the invention and this could initiate business negotiations. It is also possible through the patent documentation search for one to get a potential business idea.

A search of the patent literature could identify alternative solutions to particular technical problem. Through patent documentation search one could identify such alternative technologies which are more economical, efficient, and environmentally friendly.

2.2 Formulate business strategies and make forecasting of technology and business

Patent information could also be used to monitor technology trends as well as competitor's R&D activities. A patent analysis may reveal which companies are doing what R&D in the field of technology, which the company is engaged. Patent information is potentially an early warning signal of the future trends in the organization/firm.

2.3 Assist in planning for R&D work

Before a new research is initiated, it is very important to conduct a patent search to establish the state-of-art of the field. This could lead to avoid duplication as well as point out potential major competitors, whose patents might be in force and be infringed by the results of the new research. Such inclusion of patent information at the beginning of research facilitates the identification of trends in R&D, creates an environment that is conducive for the research to be effective, and produce readily applicable technical solutions to technical problems. This enables avoiding "re-inventing of the wheel".

2.4 Evaluate specific technology and identify global expertise

Patent information provides researchers, entrepreneurs and developers with up-to-date and reliable knowledge of the level of S&T and the most important trends in the development of the particular technology. A technology seeker will need information to make an informed decision of what type of technology should be acquired. Patents make available a range of viable technologies spread over both space and time i.e. technologies from different countries as well as past and present technologies. Patent information facilitates the decision making on which technologies are appropriate to acquire to meet the demand of the technology seeker.

2.5 Identify solutions to technical problems

Solution or solutions for a sought technical problem can be obtained through searching the patent literature. Patent documents often discuss difficulties of a particular process or design and advantages of the same. This enables one to avoid those process or design with difficulties and take the ones with advantages. It provides also solutions in a shorter time than would it be if the solution should be researched. This is what the Sub-Saharan Africa should do to solve most of its technological problems be it in agriculture and in other fields. There are some solutions lying in patent documents, which could be utilized to improve the well being of the people in the developing countries. Simple technologies are needed to increase the productivity of the rural population in these countries.

2.6 Analyze technology and as a performance indicator

Patent Data could be used to measure expected output or returns on R&D activities. Patents are a useful measure of success of funded R&D programmes. By looking at the number of patents granted, it is possible to estimate the success of the programme. If the researchers are aware of this basis of assessment, they will tend to patent worthwhile inventions in the process of conducting their R&D work. Patents are usually filed during the development cycle of a particular product or process and therefore often published before the technology actually comes to market.

3.0 USE OF PATENT DOCUMENTATION IN TANZANIA

3.1 Assessing the Status of Patent Documentation Use in Tanzania

A small survey conducted during IPR sensitization seminars conducted by the Tanzania Commission for Science and Technology (COSTECH) has preliminary indicated that the use of patent documentation as a source of technological information in Tanzania is very low (Fig.2 appended). About 98% of the participants in the survey have never used

patent information; only 8% have ever used patent documentation as a source of technological information.

The non-use of patent documentation in the country is due to the lack of awareness of Intellectual Property Rights among scientists, policy-and decision-makers, and the public in general. Many people are not aware of the existence of such huge amount of information, which is available for their uses.

3.2 Initiatives to promote use of patent documentation in Tanzania

There are some efforts especially in the area of IP awareness creation in general being undertaken to promote use of patent documentation in the Tanzania.

3.2.1 Intellectual Property (IP)- Forum

One of these initiatives is the establishment of the IP-Forum, which has been registered in 2005 as a legal entity to enable it to perform its activities autonomously. This has been a child of The Business Licensing and Registration Agency (BRELA) and The Tanzania Commission for Science and Technology (COSTECH) who organized a Technology Developers Forum in July 2001 which led to the initiation of the formation of the IP-Forum. The aim of forum was to bringing together all stakeholders to discuss on the promotion and development of IP in the country. Both institutions have supported the annual meetings of the IP-Forum since then.

3.2.2 African Union intellectual property and technology day

Since 2001 the IP-Forum in collaboration with BRELA and COSTECH has been organizing the Marking of the African Union declared African Intellectual Property and Technology Day, every 13th September. These occasions were marked with three events: an exhibition of technologies and other creative works; Workshops on IPR issues; and statements by the Minister for Industries and Trade, Chief Executive Officer (CEO) of BRELA, and Director General (DG) of COSTECH in the newspapers (BRELA and COSTECH, 2004). These are all efforts to create awareness on intellectual property issues among the stakeholders and public at large. Since 2004, firms and industries have been requested to support this activity.

These events have also been obtaining support from the African Regional Industrial Property Organization (ARIPO) and the World Intellectual Property Organization (WIPO) in terms of the awards for the winners of the best exhibitions (BRELA and COSTECH, 2003).

3.2.3 Intellectual property awareness creation seminars

Different institutions have taken initiatives to organize intellectual property awareness creation seminars and workshops in Tanzania. Among other topics, use of patent

information was emphasized. The following are examples of institutions that have taken these initiatives among other institutions which have done the same.

(a) COSTECH initiatives

The Centre for the Development and Transfer of Technology (CDTT) at COSTECH has also put an activity of IPR Awareness Creation under its work programme on Endogenous Capacity Building on S&T Management. The planned activity is to conduct a series of seminars on intellectual property; establishment of Institutional IP-Policy; patent documentation; as well as IP- Management to a number of institutions. The objectives of the seminars are: to create awareness on IP; to introduce patent documentation as a source for technological information; and to encourage patenting of technical solutions as well as to sensitize the formulation of institutional intellectual property policy and IP management units.

Since 2002 about twenty five seminars have been held at different institutions, attended by about 500 scientists, technologists, and students.

Through these efforts some of the R&D and S&T institutions in the country, such as Sokoine University of Agriculture (SUA) and Tropical Pesticide Research Institute (TPRI), have established their Institutional IP Policies.

(b) WIPO initiatives

The World Intellectual Property Organization (WIPO) has also participated to create IP awareness in the country. A number of workshops and seminars have been conducted in collaboration with BREL A. Just to mention a few are: The Joint WIPO-WTO Regional Workshop on Implementation of the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS Agreement) held in Dar es Salaam in 2002; Patent Classification Training Seminar in 2003 and WIPO Workshop on Intellectual Property as a Tool for Developing National Branding Strategies held in 2005.

WIPO in collaboration with the then Ministry of Science, Technology and Higher Education (MSTHE), organized a Regional Seminar on the Benefits of the Intellectual Property System for University Researchers and Research and Development Organizations in 2000.

(c) Other initiatives

Other initiatives include that of the East African Regional Programme and Research Network for Biotechnology, Biosafety and Biotechnology Policy Development (BIO-EARN), which is a programme aimed at building capacity in Ethiopia, Kenya, Tanzania

and Uganda in order to promote appropriate research and related topics. Among the related topics is the Intellectual Property Rights (IPR).

In the efforts to promote and develop IP in the four Eastern African Countries, the BIO-EARN Programme organized a number of Workshops and carried out a study on the Current National Policy Frameworks on Intellectual Property Management and IP Management Capacity Building in Tanzania in 2003 (Shemdoe, Kasonta and Chuwa 2005).

BIO-EARN organized a Regional IPR-Workshop at Masai Mara Serena Lodge, Kenya in December 2001 with the following objectives (NCST, 2002): to sensitize the researchers on the need to seek protection of their inventions and innovations; to sensitize policy-makers on the importance of IPR systems; to stimulate regional collaboration among EA countries on IPR matters; and to stimulate integration of IPRs in research institutions and universities.

During the Workshop it was realized that there is lack of IP awareness in the region. Efforts should be made to create this awareness and develop IPR-systems in the region. A Technical Task Group was formed with 3 representatives from each participating country. The group was responsible to design action plans and mechanisms for IPR development within the region.

In collaboration with the International Livestock Research Institute (ILRI), the BIO-EARN organized an Intellectual Property Management Training Program in Nairobi Kenya in 2004 with participants from the Eastern African region.

Another initiative is that of the African Programme for Health Innovation (APHI), which organized an “East African Regional Workshop on Introduction to Intellectual Property Management-Enhancing the value of research output” in Dar es Salaam, Tanzania in 2005. The workshop drew participants from the East African region.

4.0 EXAMPLES OF SUCCESSFUL USE OF PATENT DOCUMENTATION IN EAST AFRICA

In Kenya one literature teacher has used the service of the Moi University Holding limited to obtain patent information. He obtained some downloaded patent searched documents on detergents, office cleaner chemicals, and shampoos, which he was interested in. With this information he managed to manufacture detergent which is doing well in the market. He had also developed a shampoo and an office cleaner chemical which are also in the market. He has employed one person apart from his housewife leave alone those engaged in selling of the products (Mbayaki, 2005). This demonstrates how wealth could be generated from patent documents.

During the IP awareness creation seminar at the Tanzania Engineering Manufacturing and Designing Organization (TEMDO), they had a practical problem of getting information on powder mixer which they were required to manufacture for a client. In

searching on the patent document database about 50 patent documents were obtained and one of them suited their need. So instead of using a lot of time to design the powder mixer they modified the one from the patent document to suit the Tanzania situation.

So it is a fact that utilization of the technical information in the patent documents can save time and resources and enable developing countries achieve their development goals. We should remember that some of the solutions in the patent documents are no more applicable to the developed world and are no more been worked in those countries, but could be very important to the least developing countries particularly, the sub-Sahara Africa.

5.0 POTENTIAL SOURCES OF PATENT INFORMATION

The major potential source of patent information currently is the Internet. There are several databases available, some are commercial and some could be accessed freely. Some examples of freely accessible databases are through the following addresses: <http://www.european-patent-office.org>; <http://www.ep.dips.org>; <http://www.patents.gov.uk> and <http://www.uspto.gov>.

Normally, the patent information is stored in different forms including paper documents, microfiche films, CD-ROMs, DVDs, and databases. For example in Tanzania, Business Registration and Licensing Agency (BRELA) could be one of the potential sources of patent information. One could access a CD-ROMs with abstracts of the patents. After selecting the relevant patent, the hard copies could be ordered from WIPO or ARIPO. Another source of patent information in Tanzania will be the envisaged Patent Information and Advisory Services Centre hosted at the Tanzania Commission for Science and Technology (COSTECH).

The African Regional Industrial Property Organization (ARIPO) is also a potential source of patent information. A free service is offered for governmental and non-profit research organizations of Member States.

World Intellectual Property Organization (WIPO) is another source of patent information, whereby a free patent information service is being offered for the developing countries. Through this service one could get: Report on technical information; Information on equivalent, citations or patent families; Legal status information on published applications and granted patents; and Copies of individual patent documents. There are special request forms for each of the above types of information. More information could be obtained at: <http://www.wipo.org>.

6.0 PATENT DOCUMENTATION CONTRIBUTION TO INNOVATIONS IN DEVELOPING COUNTRIES

In the view of the author of this paper, in order for the developing countries, particularly, Tanzania to reduce poverty, technology will be a very important component. There are a number of problems in the rural and urban areas, though these

problems may be seen as of social nature, but in order to solve them they need to be reduced to the technical nature, whereby technology would be the solution.

In the rural areas simple technologies will be required to solve the people's problems and increase productivity in their economic activities. Some of these solutions have already been found somewhere in the world and were patented in the past and their patents have expired. Through searching in the patent document databases, one will find a solution. We do not need to research and re-invent the wheel. Patent information could be used, what we will need is to adopt the solutions suggested in the patent documents to our own situations.

According to Erbisch (2002), Africa has facilities and researchers that could assist the continent to have new and better agricultural products, disease control and improved manufacturing among other things only by using the contacts, expertise, and information available worldwide. If the researchers will opt to use patent information, solutions will be achieved in the shortest possible time.

Patent documentation is a potential source of solutions to the technological problems, which need to be overcome to allow socio-economic development of the developing countries. What is needed is to create awareness about this potential source of information. For example in order to achieve this objective in Tanzania, the Tanzania Commission for Science and Technology (COSTECH) in collaboration with the Business Registration and Licensing Agency (BRELA) and the World Intellectual Property Organization (WIPO) is establishing a Patent Information and Advisory Services Centre to be housed at the COSTECH's building. Among the functions of the envisaged Centre will be to create awareness on the patent information; to provide patent information; and to provide advisory services in relation to the search, use and application of the patent information.

7.0 CONCLUSION AND RECOMMENDATION

Patent documentation as a source of technological information is not mostly being used in Tanzania in which case it may apply to the other countries in the sub-Saharan Africa. Lack of IPR awareness and awareness of the existence of the patent documentation could be a reason for this situation. What is needed to be done is to make efforts to create this awareness among the scientists, technologists, inventors, innovators and the general public.

Technology is needed for the economic growth and development of the region. Among the initiatives to get some solutions for technical problems facing our peoples will be through the use of patent documentation. The use of patent information could lead to saving of the meager resources available for R&D activities in these countries and at the same time bringing simple technologies to improve the welfare of the people.

A recommendation is put forward for the R&D institutions, universities, firms and individuals to consult patent documentation in their research and development

activities. Each country should make effective use of the opportunities offered by the IP system and should formulate policies and strategies to make an effective use of the patent documentation for its economic growth.

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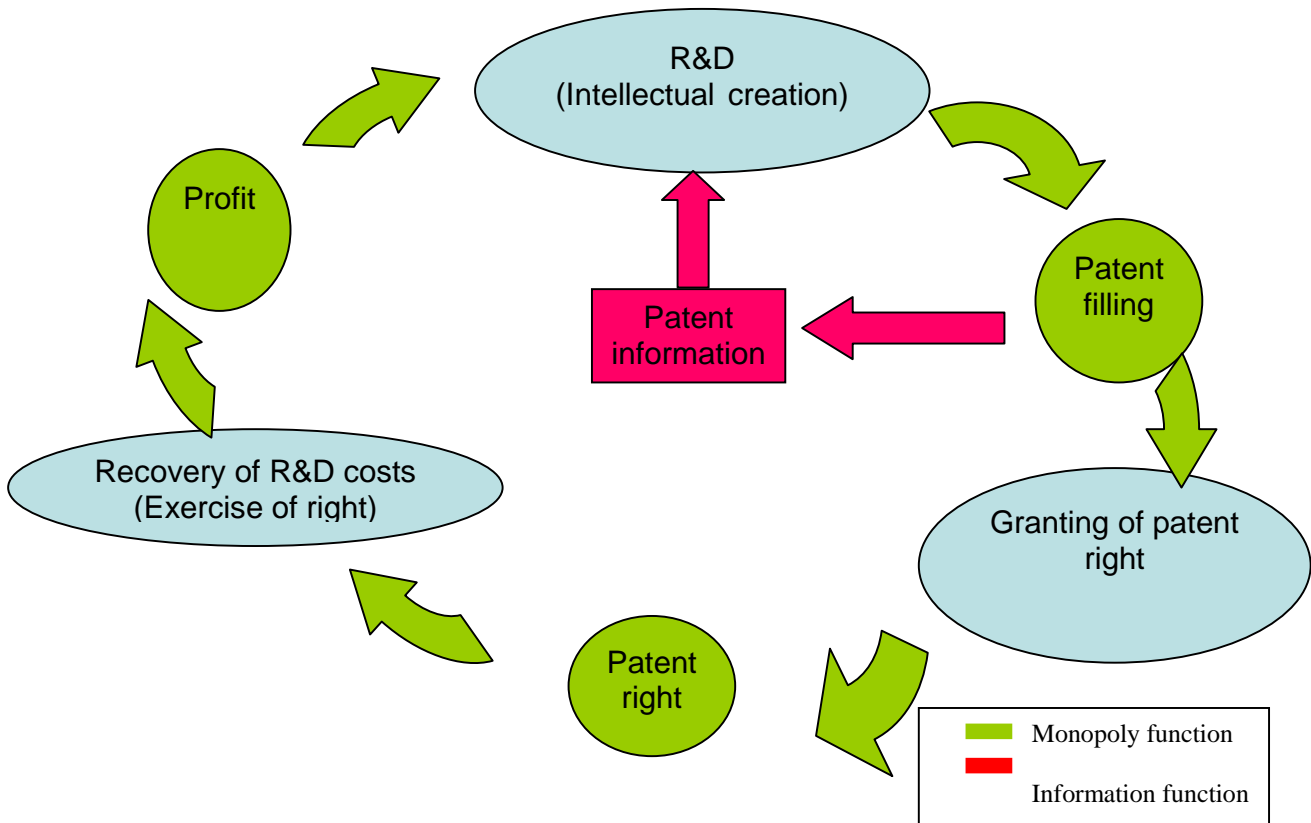


Fig.1: Intellectual property creation cycle (Source: Institute of Intellectual Property-Japan, 2001)

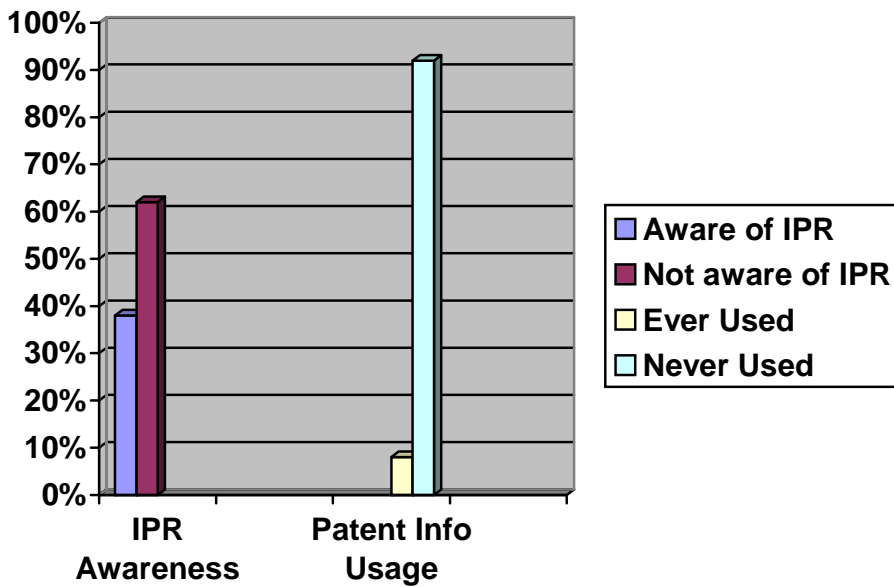


Fig. 2: Results of a survey conducted during IPR sensitization seminars in Tanzania (2002-2005)