

# Intellectual Property Policies and Technology Transfer Practices in the South Asia Region

Experiences of Public Universities and Agricultural Research Institutions

Proceedings of the Special Session Organized at the Association of University Technology Managers (AUTM)

San Diego, CA, USA, February 29, 2008

Organized by USAID, USDA-ARS, USDA-FAS and Michigan State University

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**Participants of the South Asia Session, February 29, 2008**

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**Acknowledgements**

We greatly appreciate the financial support provided by USAID, Washington, D.C., and USDA-FAS, Washington, D.C. We would also like to thank Haryana Agricultural University (HAU), Kerala Agricultural University (KAU), Bangladesh Agricultural Research Institute (BARI) and the National Intellectual Property Office of Sri Lanka (NIPOS) for their participation in making the Special Session on Intellectual Property Policies and Technology Transfer Practices of Public Agricultural Institutions of Southeast Asia at the annual meeting of the Association of University Technology Managers (AUTM) successful.

## TABLE OF CONTENTS:

Acknowledgements .....	ii
Executive Summary .....	iv
Foreword .....	v
List of Abbreviations .....	vi
<b>PART I:</b>	
<b>Background of the USAID India IPR Project and AUTM South Asia Session .....</b>	<b>1</b>
<b>PART II:</b>	
<b>Experiences of Three Countries in South Asia .....</b>	<b>9</b>
India: Intellectual Property Protection, Management and Technology Transfer Policies and Practices in India .....	11
Sri Lanka: IP Policies and Technology Transfer Practices in Sri Lanka .....	21
Bangladesh: Intellectual Property Rights in Agriculture and Technology Transfer in Bangladesh .....	27
<b>PART III:</b>	
<b>A Way Forward: Recommendations for Future Capacity Building .....</b>	<b>33</b>
List of Resource Persons .....	34
References .....	36

## **Executive Summary**

The policy environment and the landscape of intellectual property (IP) management and technology transfer practices at public universities and government funded research institutions in South Asia region are rapidly evolving. India, for example, has recently amended its patent law and enacted a new law for the protection of new varieties of plants. The countries of the South Asia region are at different stages of IP policy and technology management capacity. Public institutions are taking positive steps in building institutional and national capacity in IP management and technology transfer. The special session focusing on South Asia, organized at the annual meeting of the Association of University Technology Managers (AUTM USA), featured a panel of experts from the South Asia region who shared their experiences and reviewed recent developments in IP policies and technology transfer frameworks. The panelists also highlighted key areas for future capacity building in technology transfer where governments and international development agencies can invest to pave the way for technology transfer to succeed as a profession in the region and foster regional collaboration.

## Foreword

India and other countries in the South Asia region have signed the World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights (WTO/TRIPS), Convention on Biological Diversity (CBD) and other global treaties and agreements to enhance economic growth and sustainable development. The government policies on intellectual property rights in these countries are rapidly changing to fulfill the obligations of the WTO/TRIPS and CBD Agreements. The United States Agency for International Development (USAID) has been actively supporting agricultural research and development programs in South Asia and other parts of the world. Through the Agriculture Biotechnology Support Programs (ABSP I and II), USAID has assisted in building intellectual property management capacity as it relates to biotechnology.

Many workshops and seminars were conducted to create general awareness and provide basic education in IP management in developing countries. In April 2005, USAID, in collaboration with the US Department of Agriculture Agricultural Research Service (USDA-ARS), the Consultative Group on International Agricultural Research's Central Advisory Service on Intellectual Property (CGIAR-CAS-IP), and Michigan State University (MSU), conducted an assessment of institutional IP management capacity at five public institutions in India. A clear need for a more focused program to address and build IP management capacity at the institutional level was identified. The assessment team concluded that without institutional capacity in IP management, the investments in biotechnology research and development (R&D) would not be fruitful and productive.

To fulfill this need, under the US-India Joint Working Group (JWG) in Biotechnology, in September 2005, the USAID, through the USDA-ARS, gave a grant to MSU to work with state agricultural universities (SAU) in India to collaboratively assist in building institutional IP management capacity. The focus of this program has been with two SAUs: CCS Haryana Agricultural University (HAU) and Kerala Agricultural University (KAU). Through mentorship programs, focused internships and workshops, institutional IP management policies and Intellectual Property Rights (IPR) Cells have been developed and strengthened. The experiences of these two universities were shared with other universities and research institutions in India and Sri Lanka.

This publication presents the proceedings of the special session on IP policies and technology transfer practices in the South Asia region organized at the annual meeting of the Association of University Technology Managers (AUTM) in February 2008 in San Diego, CA. The goal of this special session was to share the experiences of the India IPR Project and highlight the current status of IP policies and practices in the region. We hope the proceedings will be useful to IP specialists, local governments and donor agencies supporting IP management and technology transfer capacity building in the South Asia region.

Sincere appreciation goes to the USAID and USDA-FAS for providing financial support for organizing and sponsoring the AUTM South Asia session.

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## List of Abbreviations

ABSP: Agriculture Biotechnology Support Programs  
AKI: Agricultural Knowledge Initiative  
AUTM: Association of University Technology Managers  
BARI: Bangladesh Agricultural Research Institute  
BINA: Bangladesh Institute of Nuclear Agriculture  
BJRI: Bangladesh Jute Research Institute  
BRRI: Bangladesh Rice Research Institute  
BSRI: Bangladesh Sugarcane Research Institute  
CBD: Convention on Biological Diversity  
CGIAR-CAS-IP: Consultative Group on International Agricultural Research Central  
Advisory Service on Intellectual Property  
CGIAR: Consultative Group on International Agricultural Research  
DAE: Department of Agricultural Extension  
DBT: Department of Biotechnology (India; Ministry of Science and Technology)  
EDV: Essentially Derived Variety  
FAO: Food and Agriculture Organization of the United Nations  
FTO: Freedom-to-operate  
GATT: General Agreement on Tariffs and Trade  
GDP: Gross Domestic Product  
GI: Geographical Indications  
HAU: CSS Haryana Agricultural University  
ICAR: Indian Council of Agricultural Research  
ICRISAT: International Crops Research Institute for the Semi-Arid Tropics  
IP: Intellectual Property  
IPR: Intellectual Property Rights  
ISO: International Organization for Standardization  
IU: International Undertaking on Plant Genetic Resources for Food and Agriculture  
ITK: Indigenous Traditional Knowledge  
JWG: US-India Joint Working Group  
KAU: Kerala Agricultural University  
MSU: Michigan State University  
NAARM: National Academy of Agricultural Research Management  
NARS: National Agricultural Research System  
NGO: Non-Government Organization  
NIPOS: National Intellectual Property Office of Sri Lanka  
PCT: Patent Cooperation Treaty  
PGR: Plant Genetic Resources  
PGRFA: International Treaty on Plant Genetic Resources for Food and Agriculture  
PPPs: Public-Private Partnerships  
PPV & FR: Protection of Plant Varieties and Farmers' Rights  
PVP: Plant Variety Protection  
R&D: Research and Development  
S&T: Science and Technology  
SAU: State Agricultural University  
SME: Small and Medium Enterprises  
TERI: The Energy and Resources Institute

TKDL: Traditional Knowledge Digital Library  
TKRC: Traditional Knowledge Resource Classification  
ToT: Training of Trainers  
TRIPS: Agreement on Trade-Related Aspects of Intellectual Property Rights  
TT: Technology Transfer  
UPOV: International Union for the Protection of New Varieties of Plants  
USAID: United States Agency for International Development  
US-AKI: US-India Agricultural Knowledge Initiative  
USDA-ARS: US Department of Agriculture Agricultural Research Service  
USDA-FAS: US Department of Agriculture Foreign Agricultural Service  
WIPO: World Intellectual Property Organization  
WorldTAP: World Technology Access Program  
WTO: World Trade Organization



## **PART I: Background of the USAID India IPR Project and AUTM South Asia Session**

June Blalock<sup>1</sup>, Saharah Moon Chapotin<sup>2</sup>, Karim Maredia<sup>3</sup> and Callista Ransom<sup>3</sup>

India and other countries of South Asia are experiencing a rapid economic growth. The role of the private sector is expanding rapidly. The governments are taking positive steps to reform their national policies and laws related to intellectual property rights and technology transfer to meet the requirements of international treaties and agreements. The investments in agricultural research and development by both public and private sectors are growing. It is an ideal time to protect intellectual properties (IP) and promote their transfer, both to foster economic growth, research and development, and to deliver useful goods and services to the end user to improve quality of life. While India and other countries in South Asia are signatories to major international IP treaties and agreements, IP protection and management in the agricultural sector has lagged behind. The governments are very keen on international collaboration to build IP management and technology transfer capacity at the national and institutional levels.

### **USAID's Investments in Agricultural Biotechnology in South Asia**

South Asian countries have signed global treaties and agreements to enhance economic growth and sustainable development, such as World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights (WTO/TRIPS) and the Convention on Biological Diversity (CBD). As a result, governments are rapidly changing their governmental policies on intellectual property rights (IPR) to fulfill the required obligations. Through programs such as the Agriculture Biotechnology Support Programs (ABSP-I and II), the United States Agency for International Development (USAID) has been actively involved in supporting agricultural development programs throughout the world. Specifi-

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<sup>1</sup> USDA-ARS

<sup>2</sup> USAID

<sup>3</sup> Michigan State University

cally, this program has allowed USAID to assist in building intellectual property management capacity related to biotechnology.

As mentioned earlier, the private sector is becoming more prominent, particularly in the agricultural sector, and all over the world the scientists and researchers in both private and public institutions are involved in biotechnology, including the new tools for enhancing agricultural productivity. So it is in that context that USAID has made significant long-term investments in agricultural biotechnology capacity building.

The first long-term project that USAID funded was ABSP-I from 1991-2003, which was managed by Michigan State University (MSU). Under this project, MSU collaborated with seven countries: India, Indonesia, Kenya, South Africa, Egypt, Morocco and Costa Rica. After 2003, a new phase of the ABSP program began, ABSP-II, which is currently being implemented by Cornell University.

USAID investments in biotechnology product development in South Asia have thus far focused on India and Bangladesh. In India, USAID sponsored the Golden Mustard Project with The Energy and Resources Institute (TERI)-India. In both India and Bangladesh, USAID has been supporting the Bt Eggplant Project, which introduces insect resistance in eggplant to reduce the use of chemical pesticides, with both the public sector and Mahyco Company. Another project is the Late Blight Resistant Potato Project with public sector partners in India and Bangladesh in collaboration with the University of Wisconsin, USA.

### **The India IPR Project**

Traditionally, the public sector throughout Southeast Asia has played a dominant role in developing and delivering agricultural technologies to farmers as public good. In India, for example, the state agricultural universities (SAUs) and the research institutes of the Indian Council of Agricultural Research (ICAR) have played a dominant role in the development and delivery of new crop varieties to farmers. India has a strong public seed sector that is actively engaged in developing new crop varieties, as well as an emerging private seed industry. Historically, the public sector has developed varieties for the public good and released them to the farmers through state government programs and extension systems. India's private sector has also benefited from the improved germplasm developed by the public sector. With the growing seed industry in India, the potential for mutually beneficial partnerships between the public and private sector can be harnessed through enhanced IP protection and management capacity at the national and institutional levels. The public sector could benefit from alliances with the private sector by expanding the marketability of its varieties and delivering them to farmers more efficiently.

With the policy reforms and liberalization of the economy, the role of the private industry in agricultural research and development is increasing. While India had a strong IPR regime for private industry, similar protections and policies were lacking in the public sector. The need for a strong public sector IPR regime became increasingly important as the private sector became more involved in the public sector. The lack of functional IP policies in agriculture thus has hindered public-private sector partnerships, and in turn, efficient sharing and flow of improved germplasm from public to private sector. The government of India has taken positive steps to create an enabling environment for fostering public-private sector partnerships in the seed industry. Most notably, a new law on the protection

of plant varieties and farmers' rights (PPV & FR) was passed in 2001 and a Plant Variety Protection (PVP) authority has subsequently been established for implementation and enforcement of this new law.

USAID takes an integrated approach to capacity building in various areas of identified needs. It has sponsored workshops, seminars, networking activities and internships to create general awareness, provide basic education in IP management and train public sector technology managers in developing countries. It also participates in obtaining freedom-to-operate (FTO) and licensing support to accompany technology development programs and also technical assistance for technology negotiations for accessing public-private partnerships (PPPs) in agriculture. A number of resources and educational and training materials have been developed. As an example, under the ABSP-I project, MSU developed a *Basic Workbook in Intellectual Property Management*, which is freely available on the website as a global public good (<http://worldtap.msu.edu>). However, the institutional capacity to handle and manage IP at public institutions needed to be addressed with a more focused and bottom-up approach – moving beyond workshops.

In April 2005, a four-member team including Ms. June Blalock (USDA-ARS), Dr. Bhavani Pathak (USAID), Dr. Victoria Henson-Apollonio (Consultative Group on International Agricultural Research Central Advisory Service on Intellectual Property; CGIAR-CAS-IP), and Dr. Karim Maredia (MSU), traveled to India and conducted an on-the-ground assessment of IP management needs at public institutions including ICAR, Department of Biotechnology (DBT), Delhi University, TERI, and Haryana Agricultural University (HAU). The assessment indicated that there was a lack of institutional IP policies and support systems for IP management at SAUs and other public research institutions. The assessment team felt that without institutional capacity in IP management, the investments in biotechnology research and development (R&D) would not be fruitful and productive. The assessment also indicated that capacity building was needed in order to implement the new PPV & FR law and operationalize the PPV & FR authority / office for enforcing this law.

Based on the assessment done in 2005, through funding from USAID, MSU, in collaboration with USDA-ARS and the CGIAR system-wide IP management program initiated the India IPR Project to help build IP management and technology transfer capacity of public institutions in India. This project was initiated under the Indo-US Joint Working Group (JWG) in Biotechnology and is now implemented under the umbrella of the US-India Agricultural Knowledge Initiative (AKI).

The overall goal of the India IPR project was to move beyond generic IPR workshops and seminars to a more focused and bottom-up approach to institutional capacity building in IP management and technology transfer. As a first step towards understanding the IPR laws and IP management policies and practices a discussion paper was developed. Since October 2005, this project has worked with two SAUs, namely HAU in North India and Kerala Agricultural University (KAU) in Southern India.

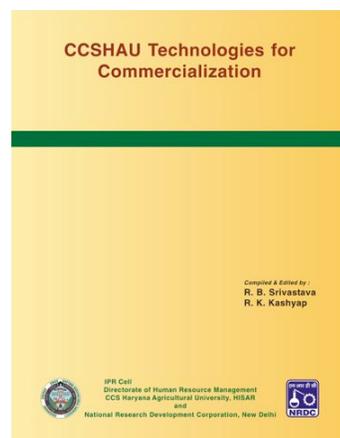
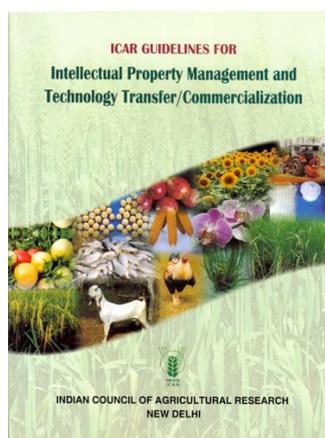
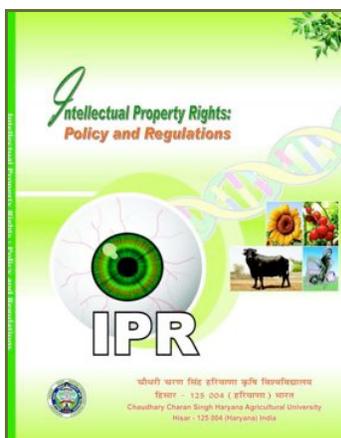
As a starting point of the capacity building process, a mentorship program was conducted at HAU in October 2005 where senior officials and administrators from HAU, KAU, and three other SAUs were brought together. The mentor team included IP management specialists from USDA-ARS, MSU, International Crops Research Institute for the Semi-Arid

Tropics (ICRISAT), Phil-Rice, ICAR, Mahyco Company and a private law firm in India. The need for farmer-centered institutional IP policy was recognized.



**IP Mentorship Program, HAU, Hisar, India. October 2005.**

The India IPR Project, through a consultative process, provided technical assistance and mentorship for developing the first draft of the IP policy for HAU which was then presented by the HAU council, faculty and the Haryana State Government. Dr. Terry Young (former president of AUTM-USA) served as a special consultant in working with HAU administrators and faculty in developing the first draft of the IP policy. The HAU policy was presented and approved by the faculty, the university council and the state government and the final version was released in summer of 2006. The HAU IP policy is in line with the IP policy of ICAR. HAU also established an IPR Cell/Office and Dr. Ram Srivastava was appointed as its coordinator. Through this Indo-U.S. Cooperation, HAU has been the first agricultural university in India to release its institutional IP policy in 2006 and establish an IPR office.



KAU has also established an IPR Cell, with Dr. C.R. Elsy serving as a coordinator, and the IP policy is near approval. A concurrent activity focusing on developing an electronic resource base and a bibliography on IP management and technology transfer was initiated by Dr. Elsy. An extensive global web search was done for gathering IP-related resources by a graduate student at KAU.

To make the IPR Cells operational, Dr. Ram Srivastava and Dr. C.R. Elsy were provided hands-on training in IP management and technology transfer at MSU through an internship program. The KAU IP policy is under review and is expected to be approved soon. KAU has already set up an IPR Cell of this office.

All of the public institutions in India are interested in setting up IP management policies and IPR Cells. To share the HAU experience, an IP winter school was organized in December 2007 where more than 25 participants from various universities and research institutes participated. The India IPR Project sponsored two resource faculty from USA and Costa Rica for this program.



IPR Winter School for Agricultural Research Institutions in India. Saharah Moon Chapotin (center) examines a display of Haryana University technologies. HAU, Hisar, India.

Considering a very high demand for IP management education and resources, a training of trainers (ToT) program was organized in February 2008 by the India IPR Project (HAU, KAU and National Academy of Agricultural Research Management (NAARM), through funding from ICAR under the AKI Program) to share the experiences and resources developed by HAU, KAU and ICAR with other research institutes and SAUs across India. The India IPR Project sponsored three resource faculty to this program. The ToT program

served as an excellent platform for sharing resources and experiences accumulated in India and through the India IPR Project. The ToT program also brought regional benefits and provided IP resources to participants from five agricultural faculties in Sri Lanka through their participation at the KAU ToT program. ICAR is planning to organize nine more workshops on IP management across India. This program has greatly contributed in laying the groundwork in terms of institutional IP management capacity building.



**IP Managers at the ToT organized by the National Academy of Agricultural Research Management (NAARM), Hyderabad, India.**

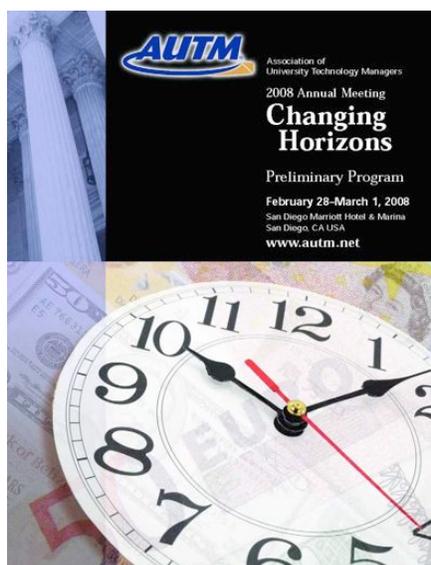


**IPR ToT Meeting with Senior Administrators and Faculty of KAU, Kerala, India.**



**Regional Benefits of the India IPR Program: Participants from Sri Lanka attend the IP Management ToT Program, KAU, Kerala, India.**

In order to share the experiences of this project with the US IP management community and international audience, a special session was organized at the annual meeting of AUTM focusing on IP management policies and practices at public institutions in India and the South Asia region.





**PART II:**  
**Experiences of Three Countries**  
**in South Asia**



# Intellectual Property Protection, Management and Technology Transfer Policies and Practices in India

Cheruvathoor Elsy,<sup>4</sup> U. Deepa<sup>5</sup> and Karim Maredia<sup>6</sup>

## Introduction

After several decades of slow growth, the Indian economy experienced a Gross Domestic Product (GDP) growth of 9.4 percent during 2006-07 and is now one of the fastest growing economies in the world (Central Statistical Organization, 2007). The key sectors of the Indian economy are the agriculture and allied sector; the industrial sector, including mining and quarrying, manufacturing, electricity, gas and water supply, etc.; and the service sector including trade, hotels, transport and communication, financial services, community, social and personal services. Agriculture is one of the most important sectors of India's economy, contributing 18.5 percent to the national income, about 15 per cent of total exports and supporting two-thirds of the work force (Central Statistical Organization, 2007). It accounted for 10.95 percent of India's exports in 2005-06 (Economic Survey, 2007).

India is a founding member of both the General Agreement on Tariffs and Trade (GATT) and World Trade Organization (WTO). Market access, domestic support and export subsidies are the most discussed aspects of the reformed multilateral trade regime under the WTO. The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) also has an impact on the key sectors of Indian economy. As a signatory to TRIPS, India is committed to providing minimum standards for the protection of Intellectual Property Rights (IPR). Thus protection and management of intellectual property has become a top priority in India in the current environment of active global competition and trade liberalization.

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## **Current Status of IPR Laws and Regulations in India**

India has signed various treaties, including GATT, WTO, Convention on Biological Diversity (CBD), Berne Convention, Universal Copyright Convention, Paris Convention, Budapest Treaty and Patent Cooperation Treaty (PCT). Recently, India has undertaken drastic reforms in its intellectual property laws in order to comply with the international agreements and treaties in tune with the provisions for IPR protection at the international level.

Amendments to the Patents Act, Copyright Act and Trade Marks Act show India's desire to change and adapt to the new trade environment. The new Plant Varieties and Farmers' Rights (PPV & FR) Act, 2001, has an impact on agriculture including the seed industry. The Geographical Indications of Goods (Registration and Protection) Act, 1999 will protect the interests and rights of local communities in different geographical areas of the country. A brief account of current status of laws and regulations related to IPR in India is provided below.

### *Patents*

India has a rich history of patent law, beginning in 1856 with the enactment of the first Indian Statute on Patent law. Throughout the years, this law has been modified with the enactment of various Acts<sup>7</sup>. On December 26, 2004 the Indian government promulgated the Patents (Amendment) Ordinance 2004 and also the Patents (Amendment) Rules, 2005 to comply with the TRIPS obligations.

The patents are administered by the Controller General of Patents, Designs and Trademarks under the control and supervision of the Ministry of Commerce and Industry, Department of Industrial Policy and Promotion, Government of India. The Head Office of the Patent Office has been established at Kolkata and branches are located in Mumbai, New Delhi and Chennai. The Office of the Controller General is in Mumbai.

India became the 98<sup>th</sup> contracting state of the PCT on September 7, 1998, and as such, nationals and residents of India are entitled to file international patent applications at any of the country's Patent Offices.

### *Trademarks*

A new statute, the Trademarks Act, 1999, came into force on September 15, 2003 in India to bring it in conformity with the TRIPS Agreement, to which India is a signatory. In India, an office of the Registrar of Trademarks has been established for the maintenance of the Trademark Registry. The Controller General of Patents, Designs and Trademarks is responsible for the implementation of trademark law.

### *Copyrights*

India has a very strong and comprehensive copyright law. The first law in copyright was enacted in the year 1847 by the then Governor General of India. When Copyright Act of 1911 came into existence in England, it became automatically applicable to India also as

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<sup>7</sup> 1859, 1872, 1888, 1911, 1970.

India was integral part of British Raj. A new Copyright Act (the Act of 1957) came into effect in 1958. The Act with five amendments in 1983, 1984, 1992, 1994 and 2003 adhere to the treaties of the Berne Convention of 1886, the Universal Copyright Convention of 1952, Rome Convention of 1961 and TRIPS Agreement of 1995. With these amendments the Indian Copyright Law has become one of the most modern copyright laws in the world.

#### *Protection of Plant Varieties*

Article 27.3 (B) of the TRIPS states that member countries are required to grant protection of plant varieties either by patents or by an effective *sui generis* system or by any combination of these. India has opted for a *sui generis* system and enacted The Protection of Plant Varieties and Farmers' Rights Act, 2001 (PPV & FR) and Rules 2003. It is unique in that it is the only one that covers both plant breeders' and farmers' rights. It protects the IP rights of farmers in respect to their contribution made at any time in conserving, improving and making available plant genetic resources for the development of new plant varieties. The Central Government has established the Protection of Plant Varieties and Farmers' Rights Authority for implementing the PPV & FR Act. Plant varieties that conform to the criteria of distinctiveness, uniformity, stability and novelty are registerable under this Act. Plant Breeders' Rights are the same for the breeder of a variety and breeder of essentially derived variety (EDV) (PPV & FR Act, 2001).

#### *Geographical Indications of Goods*

Under Articles 1 (2) and 10 of the Paris Convention for the Protection of Industrial Property, Geographical Indications (GI) are covered as an element of IPR. They are also covered under Articles 22 to 24 of the TRIPS Agreement. India, as a member of the WTO, enacted the Geographical Indications of Goods (Registration & Protection) Act, 1999, which came into force on September 15, 2003.

Under this Act, the Central Government established the "Geographical Indications Registry" with jurisdiction for all of India at Chennai, where the rights holders can register their respective goods as GI. The Controller General of Patents, Designs and Trademarks is also the Registrar of GI. Any agricultural, natural or manufactured goods or any goods of handicraft or of industry including foodstuffs can be protected under the Act. Any association of persons or producers or any other organizations or authority established by or under any law can apply for registration of the GI. The applicant must represent the interest of the producers (Geographical Indications of Goods (Registration & Protection) Act, 1999). The first product that was registered as a GI in India is 'Darjeeling Tea'.

#### *Biological Diversity*

India is one of the eight Vavilovian centers of origin and diversity of cultivated plants and is one of the 12 mega centers of biodiversity at the global level. It is estimated that there are at least 45,000 species of plants and 77,000 species of animals in the country and it is ranked 10<sup>th</sup> among the plant rich countries of the world. Numerous endemic species are present in the biodiversity hotspot areas of Western Ghats and Eastern Himalayas and hence India has taken initiatives to protect its sovereign rights over biodiversity in tune with CBD. The Biological Diversity Act, 2002 enacted the various provisions for conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits

arising from the use of biological resources and knowledge, and for matters connected therewith or incidental thereto. It is instrumental in protecting the IP rights over biological material in India.

### **IP Policies and Licensing Practices in Major Public Institutions in India**

The growing importance of IPR in research and development (R&D) led to the development of various national and institutional policies for IP protection and management in India in tune with national legislation, guidelines and international treaties.

#### *The Indian Council of Agricultural Research*

The Indian Council of Agricultural Research (ICAR) is the apex body for planning, promoting, coordinating and undertaking research and its application in agriculture and associated sciences at Central and State Agricultural Universities, colleges and other agricultural organizations across the country. In response to the changing scenario of technology generation, protection and dissemination, ICAR has developed a policy framework for intellectual property management and technology transfer / commercialization. This policy is for stimulating research and promoting enterprise growth, all for the ultimate benefit of the farming community. These guidelines became effective October 2, 2006 (ICAR, New Delhi, India, 2006). Many of the State Agricultural Universities are now developing their own policies for IP protection and management in tune with the ICAR guidelines. More information about ICAR can be found at: <http://www.icar.org.in>

#### *CCS Haryana Agricultural University*

CCS Haryana Agricultural University (HAU) in Hisar, India implemented its policy, entitled "Intellectual Property Rights: Policy and regulations," in 2007, with the aim of helping the HAU scientists access new proprietary technologies and research tools from the global community. In addition, the policy intends to protect and license scientists' new technologies to the private sector for commercialization, for the greater benefit of the local farmers and the society. The policy covers IPR management regulations at HAU, protectable intellectual properties, guidelines for identification and protection of patentable IP and their commercialization, precautions for IP management and procedure for PPV. Key considerations for technology transfer through commercialization would be state priorities relating to food security, sustainable use of natural resources, enhancing the incomes of small and marginal farmers and employment generation (HAU, 2007). More information about HAU can be found at: <http://www.hau.ernet.in>

### **The Emerging Private Sector in Agricultural Development**

Public-private sector partnerships have the potential to improve agricultural research and development in India in joint validation, scaling up, cost-effective quality production, mechanization and commercialization (ICAR, 2006).

Production and productivity in the agricultural and food processing sectors are highly supported by private companies. In the current Indian economy private companies are playing a lead role in the seed sector and in the manufacturing and sale of agrochemicals (e.g., fertilizers, pesticides, etc.). The introduction of Bt cotton was a major success in bring-

ing the private sector into India's agricultural arena. The following private companies are leaders in the seed sector: Mahyco, J.K. Agri Genetics Ltd., Indo-American Hybrid Seeds (India) Pvt. Ltd., Ankur Seeds, Sungro Seeds, Nuziveedu Seeds Ltd., Nath Seeds Ltd., Vikram Seeds, Pvt. Ltd. and Vikki's Agrotech Ltd. Another group dominate the production and marketing of agrochemicals: Bayer (India) Ltd., Dharti Agro Chemicals Pvt. Ltd., Monsanto, Rallies India Ltd., Indofil Chemicals Company, Tata Chemicals Ltd., Oswal Chemicals & Fertilizers Ltd. and E. I. Dupont India Ltd. The food processing sector has seen faster growth due to the contributions of: Britannia Industries, Cadbury India, Grandmas Food Products, Nutrine Confectionery Company Ltd. and Tata Tea.

### **Relevance and Impact of IP Protection in India**

#### *The Protection of Plant Varieties and Farmers' Rights Act, 2001 (PPV & FR) and Rules, 2003*

The PPV & FR Act, 2001, protects traditional and farmer varieties, the genetic resources contained within these varieties (for use in breeding new varieties and / or biotechnology), and new varieties derived from either the varieties or the genetic resources they contain. In addition, it protects and acknowledges the role that indigenous people have played in evolving and conserving traditional / farmer varieties by lending support to benefits sharing claims accrued by the use of traditional / farmer varieties in the development of new varieties. It also protects the genuine interests of private companies working in the seed and crop improvement sectors, which stimulates research and innovation.

#### *The Biological Diversity Act, 2002*

The conservation and protection of sovereign rights over biodiversity is of great significance for India. The Biological Diversity Act, 2002 provides for the conservation of biodiversity, sustainable use of its components and equitable sharing of benefits arising out of the use of biological resources in the country. This Act is also instrumental in protecting the IP Rights over biological material in India as it says that "any IPR application in or outside India based on any research or information on biological resources from India must be done with the previous approval of National Biodiversity Authority."

#### *The Patent Act*

The liberalization of the Indian economy is attracting many private companies to invest in the R&D sector in India. Provisions for strong patent protection in line with international protection regimes provide a safe platform for the growth of national and international companies attracted to and invited for investment in India. A strong awareness about the provisions of the Patent Act, including recent amendments, and a speedy disposal of patent applications are needed in preparation for the development of technologies and their commercialization.

#### *Geographical Indications of Goods (Registration and Protection) Act, 1999*

The Geographical Indications of Goods (Registration and Protection) Act, 1999, protects the fame of unique traditional goods and also traditional knowledge associated with processing of unique agricultural, natural and manufactured goods and thus protects rights of communities. It also boosts the demand for such quality products in the national and

international markets. Realizing the significance of GI protection, the Indian government is promoting the registration of unique goods in the country, which has led to a surge in the registration of goods. Examples of recently registered GI goods include: Muga silk from Assam, Madhubani paintings from Bihar, Alleppey Coir, Navara and Palakkadan Matta Rice, Malabar Pepper and Alleppey Green Cardamom from Kerala, Salem and Arani Silks and Kovai Cotton from Tamil Nadu, and Monsooned Malabar Coffee from Karnataka and Kerala.

### *Protection of Traditional Knowledge*

India is a storehouse of traditional knowledge and skills that have been used as the foundation in modern inventions. The term "traditional knowledge" is used to refer to tradition-based literary, artistic or scientific works; performances; inventions; scientific discoveries; designs; marks, names and symbols; undisclosed information; and all other tradition-based innovations and creations resulting from intellectual activity in the industrial, scientific, literary or artistic fields (<http://www.wipo.int>). In 1989 the concept of Farmers' Rights was introduced by the Food and Agriculture Organization of the United Nations (FAO) into its International Undertaking on Plant Genetic Resources for Food and Agriculture (IU) and in 1992 the CBD highlighted the need to promote and preserve traditional knowledge. In spite of these efforts, which have spanned two decades, final and universally acceptable solutions for the protection and promotion of traditional knowledge have not yet emerged.

An Indian expert group recently examined randomly selected 762 US patents having a direct relationship to medicinal plants in terms of their full text. Out of these patents, 374 patents were found to be based on traditional knowledge. As are other developing countries, India is also concerned about granting patents for non-original inventions in the traditional knowledge systems of the developing world.

The government of India has taken steps to create a Traditional Knowledge Digital Library (TKDL) on traditional medicinal plants and systems, which will also lead to a Traditional Knowledge Resource Classification (TKRC). The Department Of Science And Technology in its Science and Technology (S&T) policy 2003, reveals an action plan to protect India's indigenous knowledge systems, primarily through national policies, supplemented by supportive international action. For this purpose, IPR systems that specially protect scientific discoveries and technological innovations arising out of such traditional knowledge will be designed and effectively implemented (Science and Technology Policy, 2003).

### **IPR Legislation and Small Scale Farmers in India**

India is considered to be the primary center of origin of about 168 crop species and secondary center of diversity for many more other crops. Indian farmers, who had been making continuous selection and improvement of land races and wild relatives of crops and practicing their conservation over thousands of years, are responsible for the rich crop genetic diversity the country has in all crops. Crop improvement by modern scientific methods, including biotechnology, could not have been possible in the past or present, nor will it be possible in the future, without genetic diversity conserved and enriched by farmers.

India has 25 per cent of the farming population of the world and over 80 per cent of them belong to the small and marginal farmer categories. The PPV & FR Act, 2001 provides

extensive rights to farmers in due consideration of the wealth of genetic diversity existing in the country and the contribution of farmers in the conservation and enrichment of this natural wealth. India has chosen a system that protects both plant breeders' rights and farmers' rights. Rights enjoyed by the farmers from time immemorial remained undisturbed even under the purview of the PPV & FR Act. The special provisions on Farmers' rights in the Act consider the farmer as a breeder, a conserver of genetic resources and also as a cultivator.

The farmer, as a breeder, has the right to register new varieties evolved by them as well as traditional varieties conserved by them. Farmers can enjoy the rights of a conserver by making claims for benefit sharing and accounting for the contributions of farming communities in supplying genetic material in the development of new varieties. This in turn acknowledges the historic and ongoing efforts of small and marginal farmers in the on-farm conservation of plant genetic resources.

The farmer, as a cultivator, has the right to save, use, sow, re-sow, exchange, share or sell farm produce, including seed of registered variety. The farmer also has the right to claim compensation from the breeder for under performance of the variety. The Act also gives considerations to the low knowledge level of farmers in IPR and related infringement issues by giving protection from legal proceedings of an alleged innocent infringement by the farmers. Moreover, the resource poor farmer is exempted from paying fees related to variety registration. The Act also envisages to reward and recognize the farmers and farming communities engaged in the conservation as well as improvement of land races and wild relatives of crops and other economically important plants.

The Geographical Indications of Goods (Registration and Protection) Act, 1999, is another strong legal mechanism for local communities to make use of the trade opportunities under WTO. The rights of local communities over unique agricultural, natural or manufactured goods of the country with quality and reputation attributable to its geographical origin can be protected by registering them under this Act. Thus this Act not only confers legal protection to GI in India, but also promotes economic prosperity of producers of goods by enhancing the demand in national and international markets. It also helps the communities to get protection for their goods in other countries.

To empower marginalized farming communities and artisans and allow them to enjoy the protections afforded them, government institutions, non-government organizations (NGOs), activists, social leaders and legal experts should work in harmony to build capacity, create awareness, and lend legal, technical and above all financial support.

An example of such support is the story of the registration of Pokkali rice in Kerala, India. Pokkali is a unique system of paddy cultivation in the central zone of Kerala that uses only Pokkali varieties/cultivars. Pokkali fields are situated in saline tracts near to the sea coast and adopt naturally organic ways of managing salinity, soil fertility and biotic stresses. Traditional Pokkali varieties and the traditional way of Pokkali cultivation has evolved and been maintained by farmers for generations. Kerala Agricultural University took the initiative to create awareness among the farming communities of the Pokkali tract about the provisions of the GI Act, and encouraged them to protect their rights. It provided technical and legal support and served as an applicant along with Pokkali Land Development Agency for GI registration of Pokkali rice. Kerala Agricultural University has also taken

initiatives for the GI registration of other unique agricultural products like Marayoor and Thiruvalla jaggery, Kerala Nendran Banana, and Kerala Chips.

### **The Future of Intellectual Property Management in India**

The significance of IP protection and management is currently accepted as a key motivating factor for the progress of knowledge based developing economy. In such an economy IPR protection and management trigger the competition in R&D sector to foster technological inventions and their commercialization. In agriculture based economy like India IPR issues also influences, directly or indirectly, the growth of farm sector. Hence the legislations related to IP in such an economy should be enacted and implemented without affecting the livelihood security of marginalized communities. On the other hand national IP legislations and institutional policies should foster speedy technology development and commercialization. Hence the challenge in formulating IP legislations and policies and its enforcement in India will be setting up of an IP environment to encourage global competition in scientific inventions, their commercialization and trading without sacrificing the interests of poor and marginal people. Similarly supporting private sector without causing detrimental effects to the public sector is another brainstorming challenge to Indian policy makers and planners.

In the above context, IP protection and management in India should have focus on

- Development of a national policy for IP protection, management and technology commercialization
- Creation of deeper knowledge and awareness about IP protection and management in all sectors of society including scientists and other academia, students, farmers, artisans, planners, community leaders, legal people, activists etc. to harvest benefits of globalization and trade liberalization.
- Enforcement and modification of IP legislations to cater international demands without sacrificing national interests.
- Development of appropriate IP policies in the R&D institutions across the country to compete with international changes in IP sector
- Development of a legal system for protection of IP rights over traditional knowledge/skills and for sharing of financial/economic gain arising from use of such knowledge/skills
- Speedy enforcement of current IP laws in the country
- Analysis of impact of national and international treaties and conventions and national legislations on the key sectors of Indian economy
- Establishment of IP watchdog mechanism in India for effective and efficient IP protection and management

- Strengthening the efforts for capacity building especially human resources development to meet the challenges of IP protection and management
- Establishment of Intellectual property / technology transfer offices at R&D institutions and public funded universities
- Strengthening regional and global co-operation to strengthen the activities and initiatives related to IPR in India and also in the neighboring developing countries.

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# IP Policies and Technology Transfer Practices in Sri Lanka

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## Introduction

Sri Lanka is a tropical island situated south of India with a diverse climate. The population of Sri Lanka is 19 million with the Gross Domestic Production (GDP) constituting mainly of service sector (55%), industries (27%) and agriculture (18%). The country has a relatively high literacy rate of 93% with a per capita income level of US \$ 1395. The constitution in Sri Lanka is a mixture of the Presidential system and Westminster system. The legal system consists of common law traditions, certain Roman Dutch law norms and statutory law and enjoys a strong and independent judiciary.

### *Sri Lanka's Membership in International Agreements on IP*

Sri Lanka is a party to several international treaties on intellectual property (IP), including the Paris Convention for the protection of Industrial Property (since 1952), the Madrid Agreement for the Repression of False or Deceptive Indication of Source on goods (since 1952), The Nairobi Treaty for the protection of Olympic Symbol (since 1984), the Patent Cooperation Treaty (PCT; since 1982), the Berne Convention for the Protection of Literary and Artistic Works (since 1959), the Universal Copyright Convention (since 1983), the Convention establishing the World Intellectual Property Organization (WTO; since 1978), Trade Related Aspects of Intellectual Property Rights (TRIPS Agreement) of the World Trade Organization (since 1995) and the Trademarks Law Treaty (since 1996). Sri Lanka is also a member of the Convention on Bio-diversity (CBD). The current law of Sri Lanka is in compliance with the TRIPS agreement except in the area of the protection of New Plant Varieties.

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## **Current IP Regime in Sri Lanka**

### *Evolution of the IP System in Sri Lanka*

There are several and different forms of IP available in Sri Lanka today such as patents, Marks, Industrial Designs, Copyright, Undisclosed Information and Geographic Indicators (GI). Since the inception of the IP System in Sri Lanka during the British colonial period, the country has used these different forms of IP protection in varying degrees.

The first statute on intellectual property in Sri Lanka was the Inventions Ordinance No: 06 of 1859 under which the first Sri Lankan patent was granted on November 22, 1860 (for a coffee pulping machine invented by a British engineer). Following the Inventions Ordinance, several other Ordinances related to trademarks, industrial designs and copyright were enacted in Sri Lanka during the period of 1860 to 1979.

The Code of Intellectual Property act no: 52 of 1979 (hereinafter referred to as 'the Code') marked a turning point in the evolution of the intellectual property system in Sri Lanka. Based on the 'model laws' prepared by the World Intellectual Property Organization (WIPO), the Code was intended to create an environment conducive to economic and commercial development of the country. It was enacted to revise, consolidate, amend and embody the law relating to copyrights, industrial designs, patents, marks and unfair competition and to provide for better registration, control and administration for related matters.

The Intellectual Property Act No: 36 of 2003 (hereinafter referred to as 'the Act') replaced the Code of Intellectual Property Act No: 52 of 1979 (as amended). The new law has been designed, *inter alia*, to provide for the law relating to intellectual property and to create an efficient environment for registration, control and administration thereof, and enforcement of the protected rights. It protects literary and artistic works, related rights, industrial designs, trade marks, service marks, associated marks, certification marks and collective marks, inventions (subjected to certain exceptions, such as life forms except transgenic micro-organisms), layout designs of integrated circuits, protection against unfair competition, undisclosed information and geographic indications (Karunaratna, 2007). The rationale underlying its introduction was clearly spelt out in Parliament during the debate on the Bill: The promotion of national creativity and the protection of creative efforts, the enhancement of the possibility of the integration of the national economy into the knowledge driven global scenario, the attraction of more investment and the protection of consumer interests have been emphasized<sup>10</sup>.

### *Administrative Authority*

The Act has established a Government Department (<http://www.nipo.gov.lk>), known as the National Intellectual Property Office of Sri Lanka, headed by the Director General of IP with the mandate of the administration of the provisions of the Act. Any person aggrieved by a decision of the Director General may appeal against such decision to the court.

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<sup>10</sup> Parliamentary debates July 23, 2003

### *Enforcement*

The mechanism for the enforcement of the protected rights encapsulates four areas, namely:

1. Civil litigation with the remedies such as damages and injunctions (a special Court popularly known as 'Commercial High Court' has been established).
2. Criminal sanctions.
3. Customs control.
4. Dispute resolution by the IP Office in the areas of copyrights and related rights.

### **Some Aspects of Operation of the Current IP Regime in Sri Lanka**

#### *Licensing and Assignment*

Most of the intellectual property rights (IPR) in Sri Lanka such as copyrights and related rights, marks, industrial designs, patents and layout designs of integrated circuits, can be assigned or licensed. The assignments and license agreements must be made in writing and signed by the parties or their duly appointed agents. In addition, the general law of contracts is applicable to them in respect to other areas.

#### *Technology Transfer Policies and Practices*

Currently there are no well-defined and accepted technology transfer practices in Sri Lanka. Several attempts<sup>11</sup> have been made in the past in order to develop science and technology transfer policies in Sri Lanka. Although effective implementations of such policies have faced various challenges, some progress has been achieved during the past few years.

The public sector lacks a patent culture. Transfer of technology from the public sector to the private sector takes place mostly in an informal manner without sufficient attention to IP agreements. Outcomes of University research and developments are usually given free to public sector institutions. In certain areas such as new plant varieties, the new developments are freely available for interested parties without any technology transfer arrangements. Due to lack of legal protection, valuable public sector inventions are routinely copied and used by both local and foreign bodies. However, transfer of technology from private sector to private sector takes place in a more organized manner. In addition, technologies originating from foreign sources are purchased under due agreements for local use. Transfer of traditional knowledge and knowledge related to genetic resources takes place indiscriminately due to the absence of required national laws and international mechanisms.

#### *IPR Issues Related to Agriculture*

The agriculture sector in Sri Lanka, including public sector breeders and private industries, is beginning to show greater interest in IPR. The government of Sri Lanka is taking positive steps to create an enabling environment for fostering public-private sector partnerships in the agriculture sector. Most notably, a new law on Protection of Plant Varieties (PPV;

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<sup>11</sup> For example, in the years 1986, 1987, 1990 and 1995.

Breeders' Rights) is in the making. This law is greatly influenced by US and Indian laws. It also incorporates provisions related to Farmers' Rights. The proposed law is now being examined by the experts in the Department of Agriculture. It is also being translated into the Sinhala and Tamil languages and will be shared with various stakeholders for their feedback. There is also a proposed law that will offer legal protection to traditional knowledge both in the public and private domains against misuse and misappropriation.

Currently, the Ministry of Science and Technology is in the process of developing a policy for the promotion of research and development (R&D) activities, IP ownership and transfer of technology, including licensing culture, public sector-private sector partnerships, benefit sharing and researcher enterprises. This policy will provide clear and defined guidelines to government R&D Institutions and universities on technology transfer and IP management practices, especially in key areas such as agriculture.

#### *Public Institutions and IP protection*

Public institutions and universities are beginning to become more aware of to the IPR system in Sri Lanka. Public institutions have started to give due consideration to areas such as development of an IP culture in R&D Institutions and universities, enhancement of enforcement of IP rights for the benefit of the owners as well as the consumers, training of enforcement officials, teaching IP in higher education institutes and assisting public awareness building.

Nonetheless, patenting of research results is still uncommon in Sri Lanka. With greater emphasis on public-private sector partnerships, there is a need to strengthen the agreement and license culture. However, there are signs of changes and improvements in these areas. The private sector is playing an increasing role in the development of new technologies related to agricultural inputs (seeds, fertilizers, pesticides, etc.) and food processing.

#### *Relevance and Impact of IP Protection in Sri Lanka*

Sri Lanka is a mega-center for biodiversity, which could be harnessed for commercial use, e.g., medicinal plants, biopesticides and biofertilizers. The existing IP laws of Sri Lanka are being successfully used for its economic development. There is a program utilizing GIs, for example: Ceylon Tea, Ceylon Cinnamon & Ceylon Sapphire. There is also a program for small and medium enterprises (SME).

#### *Biotechnology and IPR*

Sri Lanka's participation in international collaborative research programs is expanding. However, public sector scientists have limited or no access to patented research tools (e.g. genes, promoters). In addition, public institutions lack the capacity to handle and manage IP, and the scientists lack the knowledge and skills required for IP negotiations and agreement creation.

### **Looking Forward**

Although the current IPR status in Sri Lanka is improving, there are several matters that need attention and should be addressed in the future. These needs include:

- The promotion of an organized and result-oriented IP, technology transfer and agreement culture in R&D institutions, universities and the private sector
- Better enforcement of IPR for the benefit of both owners and consumers
- IP awareness and education at agricultural faculties; teaching not only IP law, but also technology and trade related aspects of IP
- The national IPR office, government ministries and other stakeholders working together as teams to promote IP and technology transfer policies and programs

*Proposed Policy on R&D, IP and Public/Private Sector Cooperation*

There is a policy in development that covers areas such as promotion of R&D activities, IP ownership, private/public sector partnerships, transfer of technology, licensing culture, benefit sharing and researcher enterprises. It will provide defined and specific guidelines to government R&D institutions and universities on technology transfer and IP management. It may perhaps follow a law similar to the Bayh-Dole Act.

*Ten-Year Plan for the Enforcement of the IPR System in Sri Lanka*

The ten-year plan of the IP Office (2007-2016) covers areas such as automation of IP administration, an improved legal regime, human resources development and awareness building, IP and economic development, infrastructure development and effective enforcement. The outcomes expected from this plan are:

- efficient and user-friendly services
- a modern IP legal regime including two laws on the protection of new plant varieties and traditional knowledge
- better trained staff for the IP Office, relevant public sector institutions and the private sector
- better informed public and IP generators
- use of the IP system in the development process
- better enforcement environment

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# Intellectual Property Rights in Agriculture and Technology Transfer in Bangladesh

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## Introduction

Bangladesh is one of the agricultural countries located in South Asia and boarded by India on all sides except for a small boundary with Myanmar to the Southeast and by the Bay of Bengal to the South. It has a tropical climate and mild, dry winters December to February. The total area of the country is 147,570 sq km and 90% of its landmass is less than 10 meters above sea level. Geographically, the country straddles the fertile Ganges-Brahmaputra Delta and normally experiences annual monsoon floods and cyclones. The land type is mostly alluvial plain, and hilly in the southeast. The land and water areas are 137,500 and 10,070 sq km respectively, and arable land is 60.7% by 180% cropping intensity. The population of the country is 150 million with a growth rate of 1.5%, and 36% people live below poverty level.

Bangladesh has seen steady economic growth in the past decade. The per capita income of the country is \$500 and the Gross Domestic Product (GDP) growth rate reached 6.51% in fiscal year 2006-07. The contribution of the agriculture, industry and service sectors is important.

The economy of Bangladesh is primarily dependent on agriculture. The agriculture sector plays pivotal role in the economy of the country and accounts for 22% of total GDP (2006-07). Agriculture is the main area for rural labor employment and more than 60% of the rural people depend on agriculture. There is an immense opportunity in agriculture based industry development and the government is encouraging international investment in all developing sectors, including agriculture.

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Manufacturing of ready-made garments and overseas workers' remittance are the major export earnings. The total export value was \$12.18 billion in 2006-07 where the garment sector contributed 70% of the total; the contribution of overseas Bangladeshis is about \$5.92 billion. International as well as local non-government organizations (NGOs) play a vital role in developing social services, education and poverty reeducation programs. The discovery of substantial reserves of natural gas in Bangladesh could significantly boost the country's economy and the people's well-being if the reserves are managed carefully.

### **Participation in International Treaties and Agreements**

Bangladesh honors international treaties and agreements with global communities working for human welfare, poverty alleviation, public health, education, environment, natural resources management and humanity in general. Bangladesh became a member of the General Agreement on Tariffs and Trade (GATT) in 1972. Bangladesh also became a member of the World Trade Organization (WTO) and is considered an original member as per article XI (1) of the agreement establishing the WTO. Bangladesh is integrating with the world economy through implementing WTO agreements and making corresponding legal reforms, considering not only opportunities, but also risks.

Bangladesh is rich in biodiversity, and some products and processes need protection. Bangladesh signed the Convention on Biological Diversity (CBD) on June 5, 1992 and became a party on May 3, 1994; and signed the International Treaty on Plant Genetic Resources for Food and Agriculture (PGRFA) on October 17, 2002 and became a party on November 14, 2003 by ratification. The relevant action plan on conservation and sustainable use of PGRFA, the fair and equitable sharing of benefits derived from their use is in harmony with the CBD.

### **Current Status of IPR Laws and Regulations**

Just after accession to the WTO, the parliament passed the Law Commission Bill of 1996 and on September 9, 1996, it became an Act of Parliament (the law Commission Act No XIX of 1996). Under the auspices of the Commission, the government has adjusted and is continuing to adjust its laws, regulations, and rules controlling such areas as international trade, foreign investment, intellectual property protection and customs inspection, as well as arbitration and dispute regulations. Bangladesh has made very significant progress in changing its IPR related laws to be in line with WTO's Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS). Very recently, another amendment was made to the Copyright Acts of 2000 to redefine and extend the scope to include computer programs. The old Patent and Trademarks Acts introduced changes in the patent and trade mark law in 2003 to make a uniform administration under a single office.

### **The Plant Variety Protection System**

Modern agriculture has offered a significant contribution to food security through the Green Revolution by using appropriate genes in elite backgrounds. However, it has also limited farmers' access to seed, increased genetic erosion and restricted genetic resources conservation. The Plant Variety Protection (PVP) System aims to harmonize and preserve the varying interests of farmers, breeders, biotechnologists and inventors while promoting new technologies in agriculture. Plant breeders' and farmers' rights are important to pro-

mote the utilization of genetic resources in crop improvement and to allow farmers access to improved seeds without any restrictions. In Bangladesh, plant breeders are working with the public sector in national crop improvement programs, where farmers' rights are automatically protected by allowing them access to the seeds without any restrictions, and breeders' rights are vested into public interest.

However, the Plant Variety Protection and Farmers' Rights Acts 2007 has been approved by the government, providing legal protection for breeders and farmers by the *sui generis* system. Farmers' Rights are defined as the rights arising from the past, present and future contributions of farmers in conserving, improving and making available plant genetic resources. Therefore, farmers are allowed to regenerate any seeds for their own use, and exchange or sell seeds in the community without any label or trade marks. Breeders' rights for the private sector are protected for a period of 10 years as the variety is passing through national seed board requirements. The seed legislation of Bangladesh provides adequate protection of farmers' rights for varieties that are used by breeders, and includes provisions to ensure the farmers' privilege in order to encourage farmers to continue participating in plant genetic resources (PGR) conservation and use. Bangladesh is a partner of the Global Plan of Action on PGRFA, and implementing Farmers Rights is one of the long term objectives in order to participate in *in situ* conservation.

### Agricultural Research and Development in Bangladesh

Agricultural research is mostly involved in the development of a combination of technologies, mainly crop improvement, quality seed production, farm equipment and machinery, post harvest technology and value addition. Food production and productivity have increased significantly since the Green Revolution in the early 1970s; even so, population, accessibility, gender equity, climate change and natural calamities are the major challenges to ensure food security. During the last decade, achievements in agricultural research have contributed to food security, macroeconomic stability and poverty reduction.

The National Agricultural Research System (NARS) and recently, private seed companies have been involved in variety development and quality seed production (Table 1). The Hortex Foundation of Bangladesh is also promoting agricultural products and exporting to Europe and the Middle East.

**Table 1: The new crop variety developed by NARS institutes of Bangladesh**

Research Institutes	Crops	Varieties developed
BARI	Cereals, Pulses & Oil seeds, Horticultural crops, Spices and condiments	270
BRRI	Rice	48
BJRI	Jute	13
BSRI	Sugarcane	37
BINA	Rice, Pulses & Oil seeds, Vegetables, Jute	42

BARI: Bangladesh Agricultural Research Institute, BRRI: Bangladesh Rice Research Institute, BJRI: Bangladesh Jute Research Institute, BSRI: Bangladesh Sugarcane Research Institute, BINA: Bangladesh Institute of Nuclear Agriculture

## **Emerging Private Sector in Seed, Pesticide and Food Processing Industries**

In recent years, a few private companies have become actively involved in investing in the seed, pesticides and food processing sectors, and substantial contributions have been made in quality seed development, food processing and value addition. For example, commercial pesticide products are either manufactured locally under a license from multinational companies or directly imported. The legal system for protection of rights in that case is fully implemented by the Department of Agricultural Extension (DAE), Ministry of Agriculture. The national seed laws are adequate according to the International Union for the Protection of New Varieties of Plants (UPOV). Registration and release of new varieties is done through the legal system, which is controlled by the Seed Wing of the Seed Certification Agency, Ministry of Agriculture.

Food processing technologies in Bangladesh are a new up and coming area of research and development. In the last decade, a few food processing companies have engaged in product development for the local and export markets. These industries generally followed International Organization for Standardization (ISO) and Codex Alimentarius Commission standards. Regarding quality control of processed food, only 55 food items failed to meet international standards of food marketing controlled by the Ministry of Trade.

Agricultural product development and bio-prospecting of plants for nutritional and pharmaceutical products are other new promising areas on the rise in Bangladesh. In this respect, desired genes are the most important resources, in the same way that gas, water and electricity are in terms of the building blocks for the creation of commercially saleable goods. Advances of such technology are taking place at a rate far faster than social policies can be devised to guide them or a legal system can evolve to address them. This explains the high profile of Intellectual Property Rights (IPR) in the rapidly growing public and private discourse regarding the use of genetic resources in plant breeding and biotechnology.

## **Biotechnology and IPR in Bangladesh**

Biotechnology has profoundly changed the conception of agriculture as profitable uses for gene sources in food security and environment have been discovered. The use of biotechnology in crop improvement has recently been initiated in Bangladesh with Bt eggplant from multinational seed companies. Risk assessment on biotechnology product development is a national priority. Policy makers are trying to develop good, coherent, consistent policies on genetic resources and are faced with a multitude of interconnected issues. The complex issues of intellectual property and biotechnology are further complicated by the larger trends of globalization and privatization. Bangladesh has developed biosafety regulations to assess risk and develop a management system for biosafety both nationally and regionally. National strategies for developing appropriate legislative tools to advance agricultural development must also be devised and implemented.

## **Traditional Knowledge, National Initiatives and Intellectual Property Rights**

Often Indigenous Traditional Knowledge (ITK) contains a rich understanding of plant, crop and tree species, medicines, animal breeds, and local ecological and biological resources. The rights of traditional knowledge holders in Bangladesh are not recognized

under the existing IP laws. Pharmaceutical companies are profiting from the ITK of natural resources, such as medicinal plants and underutilized crops, without offering any compensation to the communities that are custodians of such knowledge. In order to document and use the ITK, recent draft provisions for developing Acts to protect ITK are in the final stages of approval in the areas of food and agriculture, resources management, conservation of biological diversity, genetic and medical research, health trade and economic development. Recording and documenting the ITK is essential to its preservation, protection and ease of use; however, since it is generally handed down from generation to generation, such activities are difficult. Establishing a database as a tool for the defensive protection of ITK is receiving increased attention.

### **Future Management of IPR in Bangladesh**

IPR should consider the growth and development of agriculture and bio-prospecting. Protection of seed varieties should be established for food security and environment, but not to benefit the multinational companies exclusively. Farmers' access to seed, agricultural technology and bio-prospecting must be ensured by IPR and not limit the farmers' interests in general. The IPR should protect the rights of small and marginal farmers through assuring free access to any seeds, PGR and other new technologies.

### **Websites and Publications Related to IPR**

Bangladesh is lagging behind in web resources and publications related to IPR. However, one website (<http://www.biplabd.com>) is now operating and focuses particularly on IPR related to law. A few publications are now available in this regard, including a *Handbook on Rules and Regulations Relating to TRIPS Issues of WTO* and a *Handbook on Rules and Regulations Relating to Standards and Environment Issues in International Trade*. Some reports are also available (see References).

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## **PART III: A Way Forward: Recommendations for Future Capacity Building**

Based on the experiences of the India IPR Project and the Special Session on South Asia conducted at the AUTM 2008 annual meeting, the following recommendations were made by the various stakeholders for future capacity building in IP management and technology transfer.

1. Continued support for capacity building to establish new or operationalize existing IPR and technology transfer cells (offices) using specific technologies.
2. Continued training of research scientists and administrators in the use of material transfer agreements, license agreements, confidentiality, negotiation skills, and valuation of technologies.
3. Development of a web-based portal containing IPR and Technology Transfer (TT) Resources for wider access and dissemination of information.
4. Short-term visits to IP management and technology transfer offices at U.S. universities, and long-term training through internships at IP Management and TT Offices at U.S. Universities (focus on valuation of technology, negotiation skills, licensing, and business development)
5. Curriculum enhancement for introducing IPR and technology transfer courses at Agricultural Universities through training of trainers (ToT) programs
6. Establish a public sector platform for providing networking opportunities for IP and technology transfer managers and facilitating exchange of knowledge, skills and experiences – learning from each other.
7. Interactive forums on Public-Private Sector Partnerships
8. Set up mechanisms to share IP management experiences from India to other neighboring countries in the South Asia region.
9. Link experiences and resources of AUTM members with IP managers in the South Asia region.

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