

PR 1711.

Intellectual Property Rights in Protecting  
New Plant Varieties and Farmers' Traditional Knowledge -  
The Case of Rice in Sri Lanka



**INSTITUTE OF POLICY STUDIES OF SRI LANKA**

# Intellectual Property Rights in Protecting New Plant Varieties and Farmers' Traditional Knowledge – The Case of Rice in Sri Lanka

Institute of Policy Studies of Sri Lanka



## Section 1

### Information regarding Project / Project Personnel:

- (i) Grant Number: RG/2011/STP/01
- (ii) Title of the Project:  
**Intellectual Property Rights in Protecting New Plant Varieties and Farmers' Traditional Knowledge - The Case of Rice in Sri Lanka**
- iii) Principal Investigator: Dr.Parakrama Samaratunga
- iv) Co-Investigator: Ms.Dilani Hirimuthugodage
- v) Institute where Research is being carried out: Institute of Policy Studies of Sri Lanka
- vi) Date of award: ...30... (d) 12..... (m) 2011..... (Year)
- vii) Date of completion of report: 30...(d) 04 m) 2014.....(year)
- viii) Total allocation of funds (Rs.): 777,400.00
- ix) Total spent (Rs.): 777,400.00
- x) Number of Research Assistant employed: One
- xi) Post graduate degree completed with date: No
- xii) Number of Technical Assistants: No

xiii) Publications/ communications arising from the project during the reporting period

### **Publications**

- a. Hirimuthugodage, D. (2014), "Intellectual Property Rights in Protecting New Plant Varieties: The Case of Seed Paddy in Sri Lanka", Abstracts, International Conference of Agricultural Sciences, University of Sabaragamuwa, Sri Lanka.
- b. Hirimuthugodage, D. (2012), Extended abstract on "The TRIPs Agreement in Protecting New Plant Varieties and Farmers' Traditional Knowledge in Sri Lanka", Proceedings of International on Symposium on Agriculture & Environment, Faculty of Agriculture, University of Ruhuna, Sri Lanka.

### **Presentations**

- a. Hirimuthugodage, D. (2012), Presentation on "The TRIPs Agreement in Protecting New Plant Varieties and Farmers' Traditional Knowledge in Sri Lanka" at the International on Symposium on Agriculture & Environment organized by the Faculty of Agriculture at the University of Ruhuna, on 29-11-2012.
- b. Hirimuthugodage, D. (2014), Presentation on "Intellectual Property Rights in Protecting New Plant Varieties: The Case of Seed Paddy in Sri Lanka", International Conference of Agricultural Sciences, University of Sabaragamuwa, 9-10th January 2014.
- c. Hirimuthugodage, D. (forthcoming), Presentation on "The Trade Related Intellectual Property Rights (TRIPs) Agreement and the Agriculture in South Asia: A Sri Lankan Perspective", 12th Annual Conference of Asia Pacific Economic Association, Bangkok, Thailand 10-12 July 2014.

## **Section 2**

### **Executive summary of the project**

Sri Lanka is predominantly an agricultural country. In the face of growing scarcity of land, water and emerging challenges of climate change, productivity gain in agriculture will be the option available to increase agricultural output in the country. Productivity improvement should be achieved by introducing new technology generated through sustained investments. A well-established Intellectual Property Rights (IPRs) system will help to encourage innovations, technology transfers, product development etc.

Being a signatory to the TRIPs agreement, it was compulsory for Sri Lanka to formulate its IP regulations to comply with TRIPs agreement and to provide legal protection to new plant varieties via patents or by an effective *sui generis* system or by both by 2006. Although Sri Lanka passed its Intellectual Property Rights Act in 2003 to comply with TRIPs agreement it does not allow patenting of plants. Due to the inability of securing necessary protection Sri Lankan agricultural sector had to face several difficulties in international trade and also it has lost a number of opportunities to use its own plant varieties for the benefit of future generation. Further, several cases of bio-piracy and loss of patentability of new plant varieties were encountered due to lack of effective IPRs system. Presently, Sri Lanka produces almost all its seed paddy requirements. Majority of farmers (90%) use seeds paddy produced by themselves from their previous crops or else they borrow from neighbouring farmers. Thus, it is imperative to protect their inventions and knowledge in a systematic manner.

The main objective of this study is to identify the best possible protection method for new plant varieties in Sri Lanka mainly focused on seed paddy sector. The methodology of this study consisted with literature survey, key informant interviews, perception survey using a semi-structured questionnaire, focus group discussions with farmers and an expert consultation workshop.

The main finding was that the *sui generis* system is the most appropriate protection method for Sri Lanka considering its economy, agricultural patterns and farming systems and also considering the existing IPR laws in Sri Lanka. Further, the study suggested several other techniques and methods such as a need of a separate institute to monitor intellectual property activities, documentation of existing knowledge of farmers, the importance of implementing a strong IPRs system for Sri Lankan agricultural sector etc.

## Section 3

### **I). Introduction**

Sri Lanka is rich with a repository of natural resources including wild and agro biodiversity where it has plant varieties with special traits that suits different uses and different agro climatic conditions. Farming practices and continuous selection of plant varieties by Sri Lankan farmers over centuries have resulted in an output of a wide range of cultivated plants. Farming practices specializes the knowledge of farmers in several areas, especially knowledge of science in soil, rotation and mixing of crops, methods of sowing, watering, reaping, saving seeds for future use etc. Hence, their knowledge of science in farming is also recognized as an important element in agriculture as much as their labour. This knowledge is a property of the farmers; simultaneously it's a property of a community<sup>1</sup>.

In most developing countries such as Sri Lanka, agricultural development is primarily based on different crop varieties grown by farmers (*Sahai 2000*). With the global thrust for privatization, many developed countries and the large businesses thrive to control natural resources and the knowledge associated with farmers for commercial purposes. They attempt to get private ownership over natural resources by obtaining patents. Biological resources have not been registered or documented in most of the developing countries including Sri Lanka. Thus, some Global Multi- National Companies (MNCs) have engaged in bio-piracy of vital genetic resources and associated traditional knowledge found in the developing countries with the aim of obtaining patent rights for them in their own countries. In this process, the developing countries are continuously denied of the benefits of genetic resources and associated traditional knowledge which legitimately belongs to them (*Regine, 2007*).

In recent past, Sri Lanka had to face many cases of bio –piracy and loss of patents of indigenous knowledge. For an example; the case of Kothalahibutu (*Salacia Reticulate*), clearly highlights the exploitation of wild varieties and the production of drugs based on traditional knowledge to which patent rights have been granted to Japan. The patent granted to the Japanese company prevents future generations of Sri Lankans from using and producing similar drugs<sup>2</sup> (*Gunasekera, 2007*).

Agriculture sector in Sri Lanka contributes nearly 11 per cent of the country's Gross Domestic Product (GDP) (Central Bank annual Report, 2013). Nearly 31 per cent of the employed population is engaged in agricultural activities. And furthermore, it is important to note that Sri Lanka is self-sufficient in rice. The self-sufficiency ratio of rice is explained in the following table. Since 2005 Sri Lanka has recorded self-sufficiency in rice.

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<sup>1</sup>Protecting farmers' rights in the global IPR regime, available at; [www.farmersrights.org/resources/global\\_articles\\_16.html](http://www.farmersrights.org/resources/global_articles_16.html), accessed on 25/06/2012

<sup>2</sup> Patent licenses have also been obtained for Snake Gourd (*Trichosanthis Krilowii*), Bitter Gourd (*Momodica Chatantia*), Kekatiya (*Aponnogeton Crispus*) etc (*Gunawardena, 2006*).

**Table 1: Rate of Self –sufficiency in rice in Sri Lanka**

<b>Year</b>	<b>Rate of Self-sufficiency (%)</b>
2005	100.65
2006	102.98
2007	96.59
2008	116.79
2009	107.37
2010	113.91

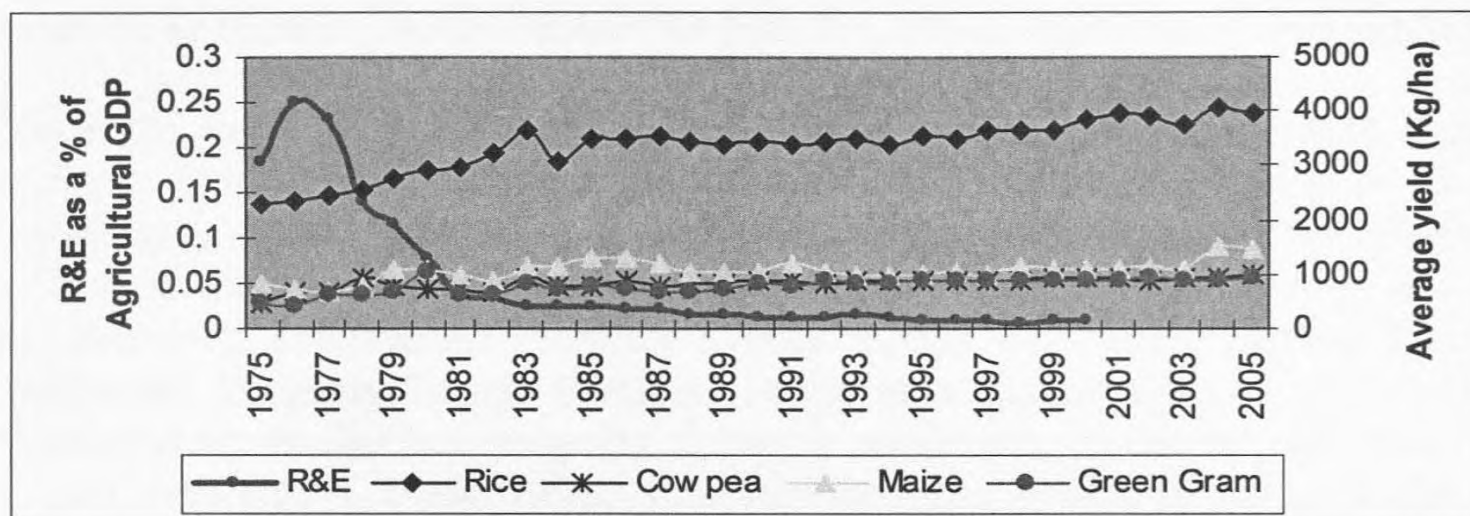
Source: Department of Census & Statistics, available at: <http://www.statistics.gov.lk/agriculture/Paddy%20Statistics/PaddyStats.htm>

Until 1950s, Sri Lankan paddy sector has used traditional methods for cultivation, processing, and we have used pest and disease control (Kem system), traditional rice varieties etc. Thereafter, with the increasing population and scarcity of land, the Ministry and the Department of Agriculture has introduced new technology to increase the productivity. During this period pure line selection was considered as the most appropriate method for the improvement of rice (Abeywardena, S.). The department has introduced new technology to varietal development, new fertilizer etc. The main objective of introducing new varieties were to increase yield, improve, pest and diseases resistance, improve grain quality etc. During 1950s several varieties from other countries too were introduced. For example; ‘Ptb 16’ from India, ‘Mas’, ‘Remadja’ & ‘Sigadis’ from Indonesia etc. However, these introductions were not successful due to long age characteristics and susceptibility to rice disease (Abeywardena, S.).

Hybrid rice research was initiated in late 1970s in Sri Lanka. At the initial stage Sri Lanka tested several rice hybrids introduced from China. However, there was not any progress due to poor adoptability. Thereafter, Sri Lanka started to develop own hybrids using Cytoplasmic Male Sterile (CMS) lines introduced from China.

The investment in agricultural research had an upward trend during the green revolution starting around 1970s. It is clear that this investment has started declining in 1977 and continued on the negative trend thereafter (Figure 1).

**Figure 1: Investment in Agricultural Research and Extension in Sri Lanka and Productivity Growth**



Source: Samaratunga, P. (2011)

However, most of the government investments were allocated to the rice sector, especially for rice varietal improvement, technology development, farmer awareness programme etc. Sri Lankan farmers mainly used two types of rice seeds. Majority of farmers (nearly 90 per cent) use rice seed produced by themselves from their previous crop or borrow from neighbouring farmers. Farmers are aware of the importance of good quality seed for high productivity, thus, they try their best to obtain quality seeds. However, it is not practical to get seed from the formal sector always<sup>3</sup>.

According to the National seed Policy Act 1996 private sector has also got involved in the seed production and marketing. However, mainly with regards to the rice sector the government and farmers are involved in rice seed producing. There are nearly 800 farmers engaged in rice seed production. Majority of farmers had been contract seed growers of the Department of Agriculture (DoA) in the past. As such, they possess the technical know-how to produce quality seed and are recognized as good seed producers at the village level.

However, Sri Lanka has certain rules and regulations to protect plant and animal varieties. Most of these Acts and Ordinances<sup>4</sup> provide physical protection for natural resources and there are no specific laws relating to new plant varieties and farmers' traditional knowledge. Most of these laws were passed many decades ago. More recently, Sri Lanka has ratified international conventions<sup>5</sup> regarding plant varieties and farmer's rights.

Most of the developing countries have faced several difficulties in protecting their new plant varieties and farmers' traditional knowledge from the developed world, mainly due to lack of strong rules and regulations. Biological resources and farmers' traditional knowledge and skills have not been registered or documented in most developing countries and with the globalization process, bio-diversity and the traditional knowledge, skills and technologies possessed by local

<sup>3</sup> Weerasena, L and Madawanaarachchi, P ; Improving quality Seed supply in Rice.

<sup>4</sup>For example; Fauna and Flora Protection Ordinance, Forest Ordinance as amended in 1995, Plant Protection Act No: 35 of 1999 etc.

<sup>5</sup> UN Convention on Biological Diversity (CBD) etc.

farmers in developing these varieties are at a stake. Global Multi-National Companies (MNCs) have engaged in bio-piracy of vital genetic resources and associated traditional knowledge found in developing countries to get patent rights for their own countries. In this process, developing countries are continuously denied the benefits which legitimately belong to them<sup>6</sup>.

Hence, the need for universally accepted rules and regulations to protect new plant varieties and farmers' rights has strongly been felt. One of the main highlights of the Uruguay Round negotiations which concluded in 1994, was the establishment of the World Trade Organization (WTO). It was the first ever comprehensive international organization which provided necessary recognition to Intellectual Property Rights (IPRs). The agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) is the most comprehensive international instrument ever negotiated on intellectual property rights. It establishes minimum universal standards concerning patents, copyrights, trademarks, industrial designs, geographical indications, integrated circuits and undisclosed information (trade secrets). It further supplements by providing additional obligations to the previously established Paris, Berne, Rome and Washington conventions<sup>7</sup> in their respective fields<sup>8</sup>.

The most relevant section in the TRIPS agreement with regard to agriculture is section 5, Article 27, which is titled as "Patentable Subject Matter". This article states: "Patent shall be available for any invention, whether product or process in all fields of technology, provided that they are new, involves an inventive step and are capable of industrial application".

Being a member of the WTO, the Sri Lankan intellectual property rights regime has to be in conformity with the TRIPS agreement. It allows member countries to grant patent protection to microorganism and non-biological and microbiological process and to provide protection for new plant varieties, either by patent or an effective *sui generis* system or a combination thereof (Article 27, TRIPS agreement).

Sri Lanka passed its Intellectual Property Act No.36 in 2003 to comply with TRIPS. However this law does not have direct bearing on biodiversity as it does not allow patenting of plants. However, previously Sri Lanka has drafted a protection of new plant varieties Act in 2000. And again in 2011 the Ministry of Agriculture with the Intellectual Property Rights Office has drafted an Act on 'Protection of New Plant Varieties'.

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<sup>6</sup>E.g. The patenting of Indian basmati rice variety by the Rice Tech company, USA, granting patent of an Indian traditional wheat variety by the European Patent Office to Monsanto over NapHal, patenting the entire gene sequences of rice by the Swiss M.N.C Syngenta, and patenting medicinal properties of turmeric, neem, jamoon, bitter gourd and such other Indian varieties and the associated knowledge, by the USA and the European M.N.Cs are only a few well known cases of bio piracy of Indian biological diversity and traditional knowledge. The Pakistan basmati rice patent was owned by the USA, Philippines Soil microbes was patented in the USA, Philippines Banaba (*Lagerstroemia* sp) was patented by Japan, Thailand Jasmine Rice was patented in the United States of America etc.(GRAIN and Kalpavriksh, 2002). These can be identified as some of the famous bio-piracy cases recorded in Asia – Pacific regions.

<sup>8</sup>Prior to TRIPS, the Paris Convention for the protection of industrial property and the Berne Convention for the protection of literary and artistic work set down the initial foundations for a multilateral framework of an international intellectual property rights regime.

IPRs have been well formulated and well applied in developed countries than developing countries. It is said that TRIPS has resulted in gross injustice to the South Asian countries, particularly to its farming and indigenous communities<sup>9</sup>. However, Sri Lanka is lagging far behind the other countries in formulating and implementing property rights pertaining to the agricultural sector, especially on new plant varieties and farmer's traditional knowledge. Therefore, the agricultural sector in Sri Lanka is vulnerable to outside exploitation because of its inability to provide necessary protection for new plant varieties and farmers' traditional knowledge. Hence, having sufficient rules and regulations to protect new plant varieties and farmers' traditional knowledge is a strongly felt need at present.

## **Report outline**

Section one gives the introduction to the report and it sets the background for the research topic by providing an overview of intellectual property rights and rice seed sector in Sri Lanka. Section two provides the objectives of the study. Methodology of the study is presented in section three followed by section four, which deals with the data analysis of the study. Section five provides a literature survey which gives a comprehensive analysis of the main elements of the research topic; TRIPs agreement, TRIPs and agriculture sector, farmers' traditional knowledge etc. Section six of the report provides four country case studies. Section seven covers existing laws and regulations with regards to the new plant varieties and farmers' traditional knowledge. Section eight of the report provides data analysis and finally section nine delivers conclusions and policy recommendations.

## **11). Scientific Scope of the Project**

Being a member of the WTO, Sri Lankan intellectual property rights regime has to be in conformity with the TRIPs agreement. The main objective of this research study is to identify the best possible protection method for Sri Lankan agriculture, especially for new plant varieties and farmers' traditional knowledge focusing on the rice seed sector, and also to propose feasible techniques and methods to enhance the productivity of the sector by implementing a strong IPR system.

The study has identified some specific objectives as well.

- Identifying issues, existing policies and policy gaps relating to IPRs in agriculture
- Evaluate the effectiveness of present policy framework
- Evaluate the present legal and institutional system relating to new plant varieties and farmers' traditional knowledge

This will reveal the policy gaps, or particular issues & problems that are left without being addressed by the existing policy. The results of this analysis on policies will synthesize accordingly in order to evaluate their effective contribution to the protection of new plant varieties and farmers' traditional knowledge.

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<sup>9</sup>[http://www.sawtee.org/pdf/IPRs%20in%20Agriculture\\_FR%20Nepal2008.pdf](http://www.sawtee.org/pdf/IPRs%20in%20Agriculture_FR%20Nepal2008.pdf)

## **111). Material and Methods**

Given the nature of the research questions being explored in the study, the methodology used will have both qualitative and quantitative components.

The methodology of this study consisted of six components.

1. Literature Review
2. Perception Survey
3. Key Informant Interviews
4. Focus Group Discussions
5. Country Case Studies
6. Brainstorming Session

### **Literature Review**

Existing literature was reviewed on intellectual property rights in protecting new plant varieties, protecting traditional knowledge, rice seed sector in Sri Lanka etc. International literature was also reviewed on IPRs and the agriculture sector, implications of implementing TRIPs agreement in other countries etc. The literature review mainly carried-out in referring scientific reports, books, publications, journal articles, working papers, research reports web based publications etc.

### **Analysis of Case Studies**

Identified different cases arisen in developed and developing countries when implementing and formulating IPRs on agricultural sector. A comparative analysis of selected countries have taken place at three levels which are as follows;

**Group 1:** countries that have implemented IPRs on agricultural sector successfully according to TRIPs agreement and the advantages or disadvantages they have experienced by complying with TRIPs.

**Group 2:** countries that have faced difficulties in implementing IPRs on agricultural sector according to TRIPs agreement analyse reasons for those difficulties and as to whether they are due to lack of legal system, political situation of the country etc.

**Group 3:** countries that are yet to implement IPRs on agricultural sector according to TRIPs agreement and the problems they have faced due to the lack of protections and opportunities they have missed as a result of delaying the proper implementation of IPRs.

### **Perception Survey Amongst Stakeholders**

Perception survey consisted of a survey questionnaire (Appendix 1) which allowed respondents to state their ideas and views on the identified research problem and it provided the opportunity for them to suggest solutions. It was carried out amongst key stakeholders consist of; researchers, policy makers, academics, media, lawyers and government officials (Department of Agriculture, Department of Commerce, Department of Natural Resources, National Intellectual Property Rights Office etc.). Perception survey was carried out amongst fifty stakeholders in the field.

### **Key Informant Interviews (KII)**

Key informant interviews amongst identified key stakeholders were carried out based on a semi structured questionnaire (Appendix 2). This was conducted amongst twenty three key informant interviewees who are in the fields of academia, government policy makers, government officials etc.

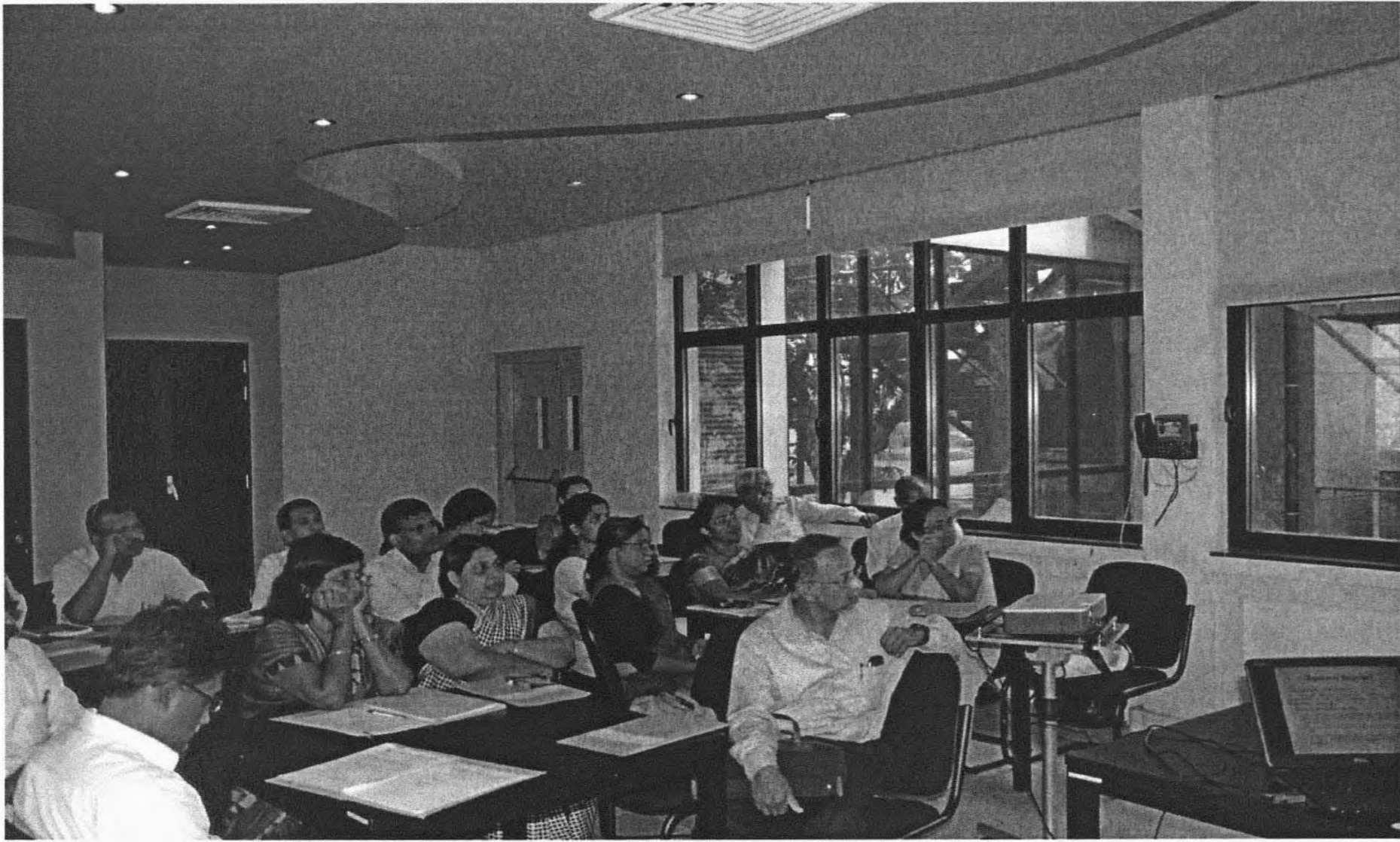
### **Focus Group Discussions (FGDs)**

Four focus group discussions were carried out in Dambadeniya, Ankumbura, Elpitiya and Benthara-Elpitiya with farmers who are using traditional techniques and methods for their farming activities. Most farmers in the selected areas are cultivating traditional rice varieties and using their own seeds. Focus group discussions were based on pre-prepared focus group guidelines. There were nearly 12-15 farmers in each FGDs.

### **Expert Consultation**

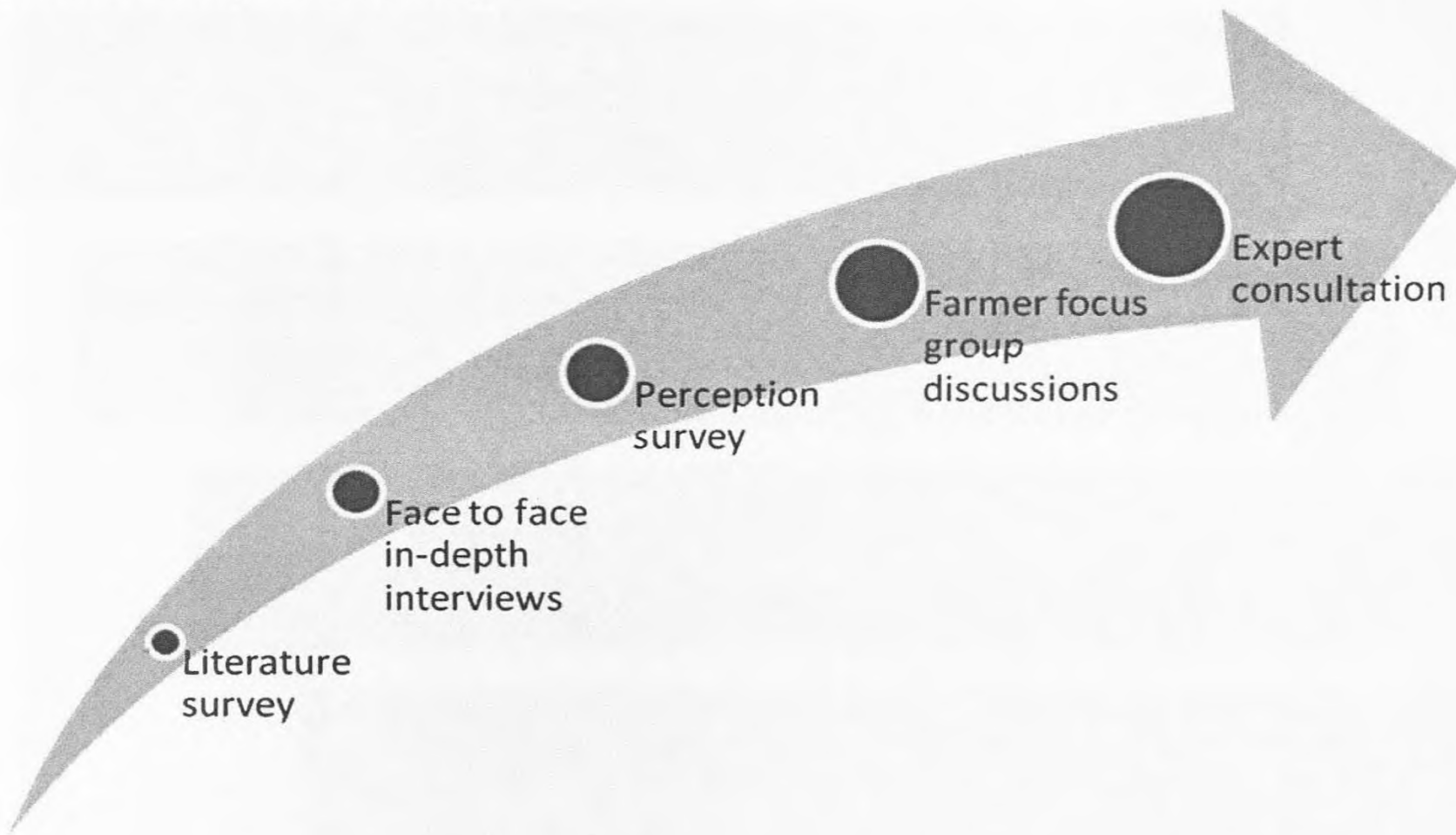
An expert consultation was held at the IPS with the participation of main stakeholders in the field. Government officials, policy makers, farmers, academia, private sector experts, legal experts etc. were participated for the event. (see Appendix 4 for list of participants). Some pictures of the expert consultation are as follows;





The results identified from the perception survey, key informant interviews and focus group discussions were compiled and presented to the expert consultation. Further, the expert consultation was based on the pre prepared questions and they were asked to prioritize identified issues and provide remedies to fill gaps in the existing system. (Refer Appendix 4 for expert consultation guidelines).

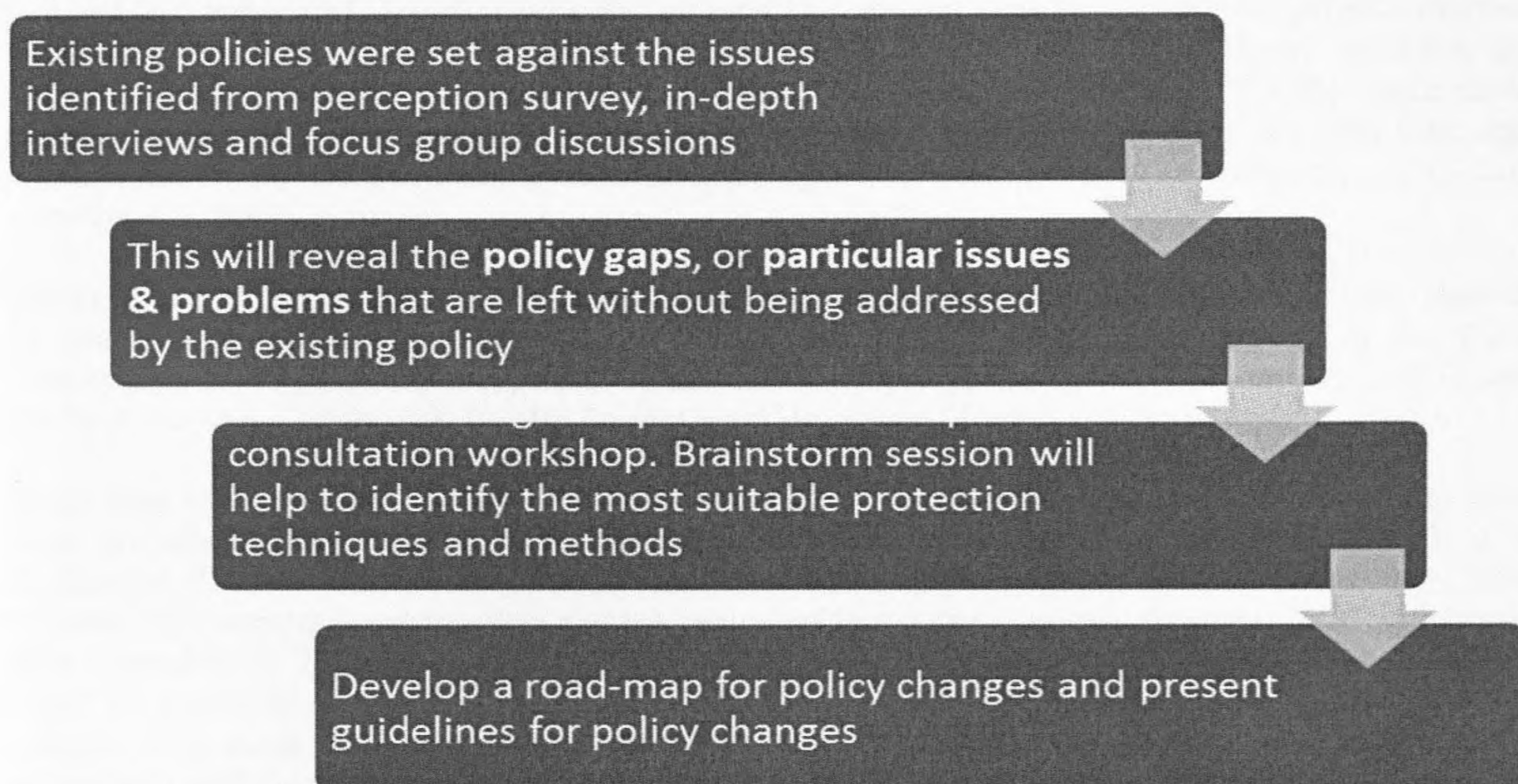
**Figure 2 : Study Methodology**



**Data Analysis**

Gathered data were analysed as follows. Existing policies were reviewed and analysed against issues identified from the perception survey, in-depth interviews, and farmer focus group discussions. It provides present policy gaps, or any particular issues that are not being addressed by the existing policy regime. Qualitative primary data, which are collected from FDGs and KIIs and perception survey, was analyzed in a Matrix Analysis analytical strategy by using NVivo-10 qualitative data analysis software. Identified data were presented to the expert consultation to identify the most suitable protection method. The expert consultation was support to develop a road map. Figure 2 explains the data analysis process.

**Figure 3: Data Analysis**



#### **4. Literature Review**

The objective of this section is to provide an understanding on the previous studies carried out in relation to the TRIPs agreement, new plant varieties, and farmers' traditional knowledge. It focuses on allied research studies carried out in developing countries which are members of WTO. Reviewing literature of theoretical background and previous studies relating to the subject helps in formulating the methodology of the study. This section consists of two sub themes namely; (i) literature relating to IPRs and new plant varieties and (ii) literature on, farmers' rights and their traditional knowledge. Further, it provides a critical evaluation of the available literature under three sub-headings; (i) literature which support the TRIPs agreement (ii) literature which oppose the TRIPs protection and (iii) literature which provides alternative solutions in protecting new plant varieties and farmers' traditional knowledge.

##### ***The TRIPs Agreement***

The TRIPs Agreement is an international agreement administered by the WTO which introduced minimum standards for many forms of Intellectual Property (IP) regulation and it attempts to create a single IPR regime. It was negotiated at the end of the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) in 1994. TRIPs agreement has constituted Annexure 1C of the Marrakesh Agreement, which established the WTO.

Intellectual property rights can be described as the right to property which results from intellectual creativity, in the industrial, scientific, literary and artistic fields. Seven categories of

intellectual properties are protected by the TRIPs agreement, namely; *copyright, geographical indications, industrial designs; patents; monopolies for the developers of new plant varieties; trademarks and undisclosed or confidential information.* (Agreement of TRIPs, available at; [http://www.wto.org/english/docs\\_e/legal\\_e/27-trips\\_03\\_e.htm#art4](http://www.wto.org/english/docs_e/legal_e/27-trips_03_e.htm#art4).) The TRIPs agreement introduced intellectual property law into the international trading system for the first time and remains the most comprehensive international agreement on intellectual property as at date (Correa, C. 2000).

The agreement also incorporates all major international conventions and treaties on IPRs, such as the Berne Convention for the Protection of Literary and Artistic Works (1971); the Paris Convention (1967) for the Protection of Industrial Property; the Rome Convention (1961) and the International Convention for the Protection of Integrated Circuits (Panagariya, A. 1999).

According to Article 65 of the TRIPs agreement, WTO members must ensure that their laws meet the minimum standards laid down in the TRIPs agreement. Developed countries had to implement TRIPs within one year of implementation of the agreement on 1<sup>st</sup> January 1995 whereas, developing countries had a grace period of four years, i.e, by 1 January 2000 which was later extended to 2006, and least developed countries have a 10 year transition period which could be extended for a further period (Article 66.1 of the TRIPs Agreement). Countries can enforce IPR rules and regulations through civil and administrative procedures or criminal procedures in their respective jurisdictions.

### ***The TRIPs Agreement and the Agriculture sector***

The most important section in the TRIPs agreement with regard to the agricultural sector is the Article 27 in Section 5 which discusses patentability. It states that inventions in every field of technology should be patentable.

#### **TRIPs Agreement**

##### **Section 5 of Article 27:**

##### **Patentable Subject Matter**

Members may also exclude from patentability:

- (a) Diagnostic, therapeutic and surgical methods for the treatment of humans or animals;
  - (b) Plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes.
- However, **Members shall provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof.** The provisions of this subparagraph shall be reviewed four years after the date of entry into force of the WTO Agreement.

**Source:** The TRIPs Agreement available at:  
[http://www.wto.org/english/tratop\\_e/trips\\_e/trips\\_e.htm](http://www.wto.org/english/tratop_e/trips_e/trips_e.htm)

The Act provides for two types of protection for new plant varieties; patents and *sui generis* system. A patent is a legal document which gives the inventor the rights to prevent others from

manufacturing, using, selling or importing the invention without his permission. Apart from all the intellectual properties granted by TRIPs the patent can be regarded as the one which has the greatest potential to affect agriculture in the developing world (*Edirisinghe, S, Watson, M. and M. Ralapanawa, 2000*).

A *sui generis* (of its own) system of protection is a special system adapted to a particular subject matter, as opposed to protection provided by the patents. It is a mild or soft form of a patent and it provides a framework of plant breeder's rights through which protection is given to the breeders, researchers, and farmers with regard to use and exchange of seeds and plant genetic materials (*Shanker, R.A. 1996*).

The application of IPRs in agriculture, as allowed under TRIPs, has long been debated, mainly due to its provisions under Article 27 (*Correa, 2000*). Article 27.3 (b) states that the governments can exclude certain kinds of inventions from patenting, i.e, plants, animals and biological processes. Simultaneously, it states that members are required to provide protection for new plant varieties either by patents or by an effective *sui generis* system or by any combination thereof. Thus, it has been debated amongst members for long time.

Given the significant contribution of agriculture in Sri Lankan economy, and its very rich biodiversity, the impact of article 27 on Sri Lankan agriculture cannot be overlooked. Furthermore, the rapid developments in biotechnology, and lower percentage of private sector investments in agriculture research and development in Sri Lanka, would highlight the inclusion of IPRs in Sri Lanka agriculture sector (*Hirimuthugodage, 2011*).

### ***Plant Breeders' Rights***

Protecting Plant Breeders' Rights (PBRs), which is also known as Plant Variety Rights (PVRs) is also important as protecting plant varieties. PBRs are intellectual property rights granted to the breeder of a new variety of a plant (*Adikari, 2007*). However, the provisions in the TRIPs agreement do not seem to accept plant breeders' rights as authorized by the International Union for the Protection of New Varieties of Plants (UPOV). It is evaluated by the fact that the provision referring to plant varieties in the TRIPs agreement is under the section on patents. Moreover, there are no provisions in the TRIPs agreement similar to the UPOV's farmers' rights, except for the general exception on the use of patents (*Rajepakse, 2007*).

The UPOV Convention is an international agreement that sets rules, similar to patents for monopoly rights over crop varieties. Several Asian countries already have, or are in the process of making these rules (*Glowka, L. 1998*). The UPOV system, however, is perceived as easy to get but provides a weak IPR protection, and may not be applicable to all countries. Sri Lanka is not a member of UPOV yet. However, TRIPs on the other hand, provides a kind of double protection for plant varieties, through a patent or a *sui-generis* system (*Trade Insight, 2007*).

### ***Traditional Knowledge of Farmers***

Traditional knowledge is people's awareness and understanding of the system and other information, which is passed on from one generation to the next, usually by word of mouth. Indigenous knowledge is often used interchangeably with traditional knowledge. In agriculture, traditional knowledge of farmers help in the development and adaptation of plants and crops to different ecological conditions (soils, rainfall, temperature, altitude etc (*Mathur, 2003*).

Traditional knowledge embraces all kinds of scientific, agricultural, technical, architectural, herbal, medicinal and ecological knowledge. These issues with the traditional knowledge and the related biological resources can be divided into three sections; 1) traditional knowledge and biological resources are indispensable, 2) traditional knowledge, in its capacity to maintain biodiversity and the underlying evolutionary processes, contributes also to the long-term survival of humanity as a whole; and 3) traditional knowledge is an asset of international trade.

Much debate on traditional knowledge at international level is taking place in the context of IPRs, more particularly through patents. Traditional knowledge of plant genetic resources is under threat (*Trade insight, 2007*). The global push for privatization of biodiversity continues to encourage ownership over these genetic resources. Many countries and the large businesses increasingly want to control these resources and the knowledge associated with them for commercial purposes. Therefore, the need of protecting the traditional knowledge from Multi-National Companies (MNCs) arisen.

### ***Implementing rules and regulations in-line with TRIPs Agreement***

IPRs are well formulated and applied well in developed countries rather than developing countries (*Regine, A.2007*). A number of developing and least developed countries believe that TRIPs has created a route for the inventors to obtain "excessively broad patents" in a manner that perpetuates and legitimizes bio-piracy and threatens the rights of local, indigenous and farming communities over their biological resources and associated technological knowledge (*Adhikari, K. 2008*).

Further, most developing countries lack the technological and financial resources to fully exploit their natural resources (*The TRIPs agreement, A guide for the South, 1997*). The Asia-Pacific region has a rich diversity of plants, which have been used by people for generations. The majority of people in Asia-Pacific still rely directly on this diversity of plants, or plant genetic resources, for food and medicine (*GRAIN and Kalpavriksh, available at; <http://www.grain.org/article/entries/81-traditional-knowledge-of-biodiversity-in-asia-pacific>*). In developing countries, patents of micro-organism and plant variety protection are the most important areas in agriculture (*Sahai S. 2000*) as most of their livelihoods depend on the subsistence agricultural system.

The TRIPs Agreement introduced rules and regulations to protect plant varieties. It obliges all developing countries to extend their patent laws to life forms or set up *sui generis* (special) regimes for the same. As it stands now, plant varieties have to be subject to monopoly rights by the year 2000, under threat of WTO-sanctioned trade retaliation. Asian countries are responding

very cautiously. Many governments are trying to come to terms with the *sui generis* option. (*Bio-piracy, TRIPS and the patenting of Asia's Rice available at; <http://www.grain.org/briefings/?id=29>* ).

Subsequently, some researchers strongly believe that TRIPs clearly will have negative consequence for the South Asian countries. The level of intellectual property demanded from South Asia and the sectors in which it is demanded, drugs and agriculture, will have together undesirable effects on food self-sufficiency and health care (*Sahai, S. 2000*).

On the other hand it has been identified that the key factor for the development process of a country is the promotion of indigenous, innovative and inventive activity. One of the main ways to accomplish this is to promote intellectual property (*Abeysekera, I.N. 1999*). Therefore, it is important for a country to have clearly defined IPR rules and regulations.

Since Sri Lanka is a member of WTO, the Govt. of Sri Lanka is obliged to introduce rules and regulations to protect plant varieties and breeder's rights law and it has to be done without much delay. Some felt that having such a law was necessary to attract new and advanced technologies and to provide incentives to plant breeders (*MONLAR, 2001*).

Sri Lanka passed its Intellectual Property Act No.36 of 2003 to comply with TRIPs. However, this law does not have a direct bearing on biodiversity and farmers' rights as it does not allow patenting of plants (*Weerasinghe, A. 2005*). Presently, most farmers in Sri Lanka depend on hybrid varieties of seeds for higher yields. Thus, providing opportunities for new plant breeders by protecting their rights is a necessary step in achieving higher agricultural productivity. An effective and productive intellectual property system is considered as an important component for a agricultural advancement (*Abeysekera, I.N. 1999*).

Most of the developing countries lack the institutional, financial and human capacity to implement strong IPR regime (*Trade Insight, 2007*). It is important that the developing countries utilize the flexibilities in the WTO system to use IPRs as a tool to achieve their development objectives. The recent examples of some developing countries indicate that this is possible. India has enacted the Plant Variety Protection and Farmer's Rights Act, which ensures that those who commercialize the knowledge or plant varieties that have been preserved and developed by farmers or local communities share the benefits latter. The developing countries can also use "geographical indications" a form of IPR recognized by TRIPs, to promote their "indigenous products" in the international market (*Trade Insight, 2007*).

Developed countries with industrialized agriculture, like USA and Australia, oriented towards export markets prefer patent protection and a strong *sui generis* system for the protection of plant varieties. On the other hand countries like Thailand and India where subsistence farming is the norm and plant breeding is still done largely by the public sector, offer much more limited protection.

Sri Lanka has very few rules and regulations with regard to protecting new plant varieties and farmers' rights. Most of these Acts and Ordinances deal with natural resources which collectively indicate a policy in favour of physical protection of natural resources, but are not specific laws relating to plant genetic resources and farmers. Because of that several bio piracy

and loss of patentability cases were recorded in Sri Lanka. It was identified that by the year 1985, twelve plants of Sri Lanka were patented in Japan (*Gunesekera, 2007*).

The Department of Agriculture (DOA) is the main institution responsible in breeding new varieties and developing crop protection methods. Private sector participation in seed production and distribution were introduced after the enactment of Seed Act in 2003 (*Perera, 2004*). Since the new policy was adopted seed enterprises were established to produce and market seeds. The DOA encourages farmers to produce their own seeds. By producing their own seeds farmers save money that would otherwise be spent on purchasing new seeds and also save time searching for new varieties. A study done by Law and Society Trust (LST) identified that it is important to conserve the traditional varieties and wild relatives of crop plants as still farmers are highly depend on those to develop new varieties (*LST, 2006*).

To achieve these aims, new technologies such as crop production under protected environments (plant houses) and biotechnological methods have all been experimented. Several institutes can be identified as the seed producing and marketing institutes under the guidance of the DOA For example; Seed Certification and Plant Protection Centre, Plant Genetic Resources Centre, Plant Protection Center etc<sup>10</sup>.

Nearly 90 per cent of Sri Lankan farmers are using rice seeds produced by them from their previous crop or borrow from neighbouring farmers. And the rest comes from the formal seed supply system which is provided by the DoA. Presently, there are nearly 800 farmers engaged in rice production. Majority of these farmers had been the Contract Seed Growers of the DoA in the past (Weerasena, S.L and W.P Madawanarachchi, available at; [agrilearning.goviya.lk/Paddy/Paddy\\_Research/Paddy\\_pdf/All.pdf](http://agrilearning.goviya.lk/Paddy/Paddy_Research/Paddy_pdf/All.pdf)).

Protecting farmer's traditional knowledge in developing new rice varieties is important as it plays a considerable role in developing new varieties. Apart from that several companies too are involved in seed production. For an example, several farmer companies, Small Scale Seed Enterprises, Multi-national companies are involved in agribusiness.

Nearly 33 per cent of countries Research and Development (R& D) expenditure in 2008 were spent on agricultural activities and higher percentage of that spent on seed variety improvements. In commodity wise higher percentage goes to plantation crops, however, a substantial percentage goes to rice crop too (R&D Survey, NSF, 2008).

The private sector stepped into Asia's seed supply in the 1980s when World Bank and US-supported seed programs and hybridization of new crops converged. Transnational corporations dominate applications for PVP and patents in developing countries. At present, 97 per cent of all patents are held by nationals of industrialized countries and 90 per cent of all technology and product patents are held by global corporations. More than half of the current biotech patents on rice are owned by a handful of mostly Western chemical conglomerates (for example; DuPont, Mitsui and Monsanto are the main).

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<sup>10</sup>Sri Lanka Agriculture, Information about Agriculture in Sri Lanka , available at; <http://www.nationsencyclopedia.com/economies/Asia-and-the-Pacific/Sri-Lanka-AGRICULTURE.html>

Many groups argue that instead of allowing IPR on plant varieties, developing countries should urgently establish mechanisms to protect and encourage farmers' rights and community innovation (*GRAIN*, available at; [www.grain.org](http://www.grain.org)). However, many Asian countries are trying to fulfill their *sui generis* requirements under TRIPs in the hope of simultaneously attracting foreign private sector investment for domestic R&D, protecting the farmers, and providing some boost for their own public research systems.

In light of the above, it is imperative for a country like Sri Lanka to implement rules and regulations in line with the TRIPs agreement to protect its staple food- rice.

## **5. Conceptual Framework**

This section explains how economic theory relates to the IPRs and the importance of having IPRs to protect new plant varieties. It explains the relationship between IPRs and the economic development. This further discusses whether the strong IPR system accelerates the economic growth or whether it hindrance economic growth. The analysis emphasizes that the countries IPRs systems needs to be woven according to their socio –economic patterns.

### **5.1 Intellectual property rights and economics**

Economic theory suggests that intellectual property rights could either enhance or limit economic growth. However, evidence is emerging that stronger and more certain IPRs could increase economic growth and foster beneficial technical change, thereby improving development prospects (*Maskus, 2000*). Nevertheless, the significance of these growth effects would be dependent on circumstances in each country. However, with appropriate complementary policies and transparent regulation, IPRs could play an important and positive role in promoting economic growth.

There are two central economic objectives of intellectual property protection. First is to promote investments in knowledge creation and business innovation by establishing exclusive rights to use and sell newly developed technologies, goods, and services. The second goal is to promote widespread dissemination of new knowledge by encouraging (or requiring) rights holders to place their inventions and ideas on the market (*Fink and Maskus, 2005*). When there are a lack of intellectual property protections or weak intellectual property rights, firms are not willing to incur costs in research and commercialization activities. In economic terms, weak IPRs create a negative dynamic externality (*Fink and Maskus, 2005*). Weak IPRs fail to overcome the problems of uncertainty in R&D and risks in competitive appropriation that are inherent in private markets for information. Information is a form of a public good in that it is inherently non-rival and developers may find it difficult to exclude others from using it (*Fink and Maskus, 2005*). In economic context it is socially efficient to provide wide access to new technologies and products, once they are developed at marginal production costs.

International policies on protecting IPRs have gradually changed with time. Presently, rules on protecting patents, copyrights, trademarks, and other forms of IPRs have become a standard element of international trade agreements. Most significantly, during the Uruguay Round of multilateral trade negotiations implemented the TRIPs agreement, it sets out minimum standards of protection for intellectual properties.

In theory, when a country strengthens its IPR protection, it must strike a balance amongst several important trade-offs. In a closed economy, IPRs provide incentives to inventors to develop new knowledge and to authors and artists to create forms of artistic expression (*Dixon and Greenhalgh, 2002*), which in the long run generate gains from the introduction of the new products. However, from the perspective of efficiency, they are only a second-best means of encouraging invention, as the market exclusivity conferred by IPRs reduces current competition and may therefore lead to a static distortion in the allocation of resources.

A weak IPR regime might allow domestic firms to imitate foreign technologies and thereby contribute to economy-wide productivity and income growth. On the other hand stronger IPRs could be better suited to promoting technology diffusion, by enhancing access to knowledge-intensive foreign inputs and promoting formal technology transfer through joint ventures and licensing agreements (*Maskus, 2000*).

Many developing countries traditionally did not provide strong protection for intellectual property; instead they host industries that rely on copying foreign technology and products. Therefore, when introducing IPR reforms it will create several difficulties. According to (*Fink and Braga, 2005*) those can be identified as; misallocation of resources, loss of employment in copying industries, higher prices for final and intermediate goods etc.

IPRs affect international trade flows when knowledge-intensive goods move across national boundaries (*Maskus, 2000*). The importance of IPRs for trade has gained more significance as the share of knowledge-intensive or high-technology products is a significant portion of total exports and imports.

It has been identified that the standards adopted by countries to protect their IPRs as well as the effectiveness with which they are enforced have implications for the development of international trade. Three main factors which are dealing with IPRs will help to accelerate international trade. They can be identified as follows: 1. Economic activity in most developed countries is increasingly becoming research- and technology-intensive. As a result, their export products contain more technological and creative inputs that are subject to intellectual property rights. 2. With the removal of restrictions on foreign investment by a large number of developing countries, new opportunities are emerging for the manufacture in these countries of patented products. 3. Technological improvements in products entering international trade have been matched by technological advances that have made reproduction and imitation simple and cheap<sup>11</sup>.

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<sup>11</sup>Intellectual property rights and Economics, available at; <http://www.iie.com/>

Studies that have been conducted in this area exploit the cross-country variation in trade, FDI, and licensing activity and attempted to identify whether the more stringent IPR regimes participate more or less in international commerce. Almost in all cases, the strength of IPR protection is approximated by rankings of national IPRs, in particular the widely used index of patent rights developed by Ginarte and Park (1997). Their research conclusions bring forward that the multinational trading firms do not base their export decisions on IPRs in the poorest countries, second, patent rights matter importantly in middle-income, large developing countries, where such imitation is more likely.

IPR rules are important in-terms of encouraging creativity and innovation; to transfer of technology on commercial terms to business enterprises in developing countries; to protect consumers by controlling the trade in counterfeit goods; and to improve international trade activities (*WIPO, 2009*).

The development of international trade can be adversely affected if the standards adopted by countries to protect IPRs vary widely from country to country, the lax or ineffective enforcement of such rights can encourage trade in counterfeit and pirated goods, thereby damaging the legitimate commercial interests of manufacturers who hold or have acquired those rights (*Fink and Maskus, 2005*). TRIPS negotiated in the Uruguay Round, therefore lays down minimum standards for the protection of intellectual property rights as well as the procedures and remedies for their enforcement. It establishes a mechanism for consultations and surveillance at the international level to ensure compliance with these standards by member countries at the national level.

IPRs could play an important and positive role in promoting economic growth. Indeed, the system of IPRs itself may be structured in particular ways to favor dynamic competition within a system of rights and obligations. It is important to note that national regimes of intellectual-property protection strongly depend on the level of economic development. Thus, the causation between IPRs and development operates in both directions (*Maskus, K, 2000*).

Economists recognize several channels through which IPRs could stimulate economic development and growth. These processes are interdependent and it is appropriate to adopt a comprehensive view of the incentives associated with intellectual property protection (*Maskus, 2000*). Intellectual property rights could play a significant role in encouraging innovation, product development, and technical change. Developing countries tend to have IPRs systems that favor information diffusion through low-cost imitation of foreign products and technologies. There is very limited empirical information available on the economic impacts of plant breeders' rights. One recent study was performed in Argentina, Chile, and Uruguay, which have established such systems (*Jaffe and van Wijk 1995; UNCTAD, 1996*). The study looked only at qualitative indicators of the effects on private investments in plant breeding, plant breeding policies of public research institutes, international transfer of germplasm, and seed diffusion among farmers. The study shows that the systems of rights adopted have had mixed effects on these Latin American economies. They have markedly improved the ability of private breeders to control local seed markets and prevent unauthorized trade in protected varieties (*Maskus, 2000*).

By strengthening IPRs regimes, either unilaterally or through adherence to TRIPS, developing countries hope to attract greater inflows of technology. There are three interdependent channels through which technology is transferred across borders. These channels are international trade in goods, foreign direct investment (FDI) within multinational enterprises, and contractual licensing of technologies and trademarks to unaffiliated firms, subsidiaries, and joint ventures. Economic theory finds that technology transfers through each channel depend in part on local protection of IPRs, albeit in complex and subtle ways (*WIPO, 2009*). However, they are sufficiently robust to conclude that stronger IPRs could have potentially significant and positive impacts on the transfer of technology to developing countries through each of these channels.

Further, countries with weak IPRs could be isolated from modern technologies and would be forced to develop technological knowledge from their own resources. And those countries would obtain fewer spill over benefits and demonstration effects of new technologies in their economies. Moreover, technologies available to such nations would tend to be outdated.

Theory and the empirical evidence suggest that IPRs could generate more international economic activity and greater indigenous innovation; however, such effects would be conditional on circumstances. Circumstances vary widely across countries and the positive impacts of IPRs should be stronger in countries with appropriate complementary endowments and policies.

Economic theory demonstrates that IPRs could play either a positive or negative role in fostering growth and development. Evidence suggests that the relationship is positive but dependent on other factors that help to promote benefits from intellectual property protection. In brief, IPRs could be effective in market-based mechanisms for overcoming problems that exist in markets for information creation and dissemination. However, their existence could pose problems in terms of their potential for costs and anticompetitive abuse. Moreover, researchers have identified few negative impacts of strong IPRs, for example; it might raise difficult economic and social costs, supports monopoly pricing system etc.

## ***5.2 TRIPs and Agriculture***

TRIPs represent the existing global state of IP standards, and is legally binding on all its member countries. This is the only one amongst several multilateral agreements under WTO which have significant impacts on global trade (*Maskus, 2000*). TRIPs has a direct impact on agricultural trade and development, particularly agricultural biotechnology (*WIPO, 2009*). Its impact on agricultural trade is comparatively more important for developing countries as agriculture is still a significant stakeholder of many of its countries' GDP, especially for the Asian countries. In addition, many of the poor in Asia depend on agriculture for their livelihood. However, its biodiversity provides Asia with a distinct advantage compared with biodiversity-poor neighbours.

The key element of TRIPs agreement for agricultural sector is the requirement for WTO members to make patents available for any inventions and most important article in the TRIPs agreement when considering agriculture sector is the **Article 27**. It states about patentability; "*Patent shall be available for any invention, whether product or process in all fields of*

*technology, provided that they are new, involve an inventive step and are capable of industrial application. Further, patents shall be available for any inventions, and patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced*". A patent is a legal document which gives the inventor the right to prevent others from manufacturing, using, selling or importing the invention without his permission. If the subject matter of the patent is a product, the patent confers on the owner, the right to prevent third parties not having the owner's permission from making, using, and selling the product. If the subject matter of the patent is a process, the patent confers on the owner the right to prevent third parties not having the owner consent from using process. The term of protection shall not be less than twenty years from the date of filing of the patent application.

**Box 1: Article 27 of the TRIPs agreement**

**SECTION 5**

**Article 27: Patentable Subject Matter**

1. Subject to the provisions of paragraphs 2 and 3, patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application.<sup>5</sup> Subject to paragraph 4 of Article 65, paragraph 8 of Article 70 and paragraph 3 of this Article, patents shall be available and patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced.

2. Members may exclude from patentability inventions, the prevention within their territory of the commercial exploitation of which is necessary to protect *ordre public* or morality, including to protect human, animal or plant life or health or to avoid serious prejudice to the environment, provided that such exclusion is not made merely because the exploitation is prohibited by their law.

3. Members may also exclude from patentability:

- (a) diagnostic, therapeutic and surgical methods for the treatment of humans or animals;
  - (b) plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes.
- However, Members shall provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof. The provisions of this subparagraph shall be reviewed four years after the date of entry into force of the WTO Agreement.

Article 27.2 indicates that interventions may be excluded from patentability in member's territory only if it is necessary to prevent the exploitation of the intervention in order to protect public order and morality. Article 27.3 states the items excluded from patentability. Article 27.3 reads as follows; Article 27.3 (a) excludes diagnostic, therapeutic and surgical methods from treatment of human and animals. Article 27.3 (b) states about the patent excludability of plants, animals and micro-organism and about the protection provided through an effective *sui generis* system, by patents or by both. Table 1 explains the three types of protection under TRIPs agreement for plant varieties and member countries have the freedom to select one of the options mentioned in the table below.

**Table 2 : Options for the protection of new plant varieties in TRIPs**

<b>Option 1</b>	<b>Option 2</b>	<b>Option 3</b>
WTO members can choose to protect plant varieties through patents	WTO members can develop an effective sui generis system to protect plant varieties. This means they should bring an effective kind of national law that grants IPR over new plant varieties through plant breeders' right certificates.	WTO members can develop a system that gives patents as well as plant breeders' "rights certificates" to protect plant varieties.

Source: Farmers' Rights, 2007

According to the TRIPs agreement, there is an imperative requirement on the part of the person applying for a patent protection to disclose the invention in such manner that would enable a person skilled in the art to make and use the invention.

### 5.2.1 Critical analysis of Article 27

The application of IPRs in agriculture, as allowed under TRIPs, has long been debated, mainly due to its provisions under Article 27. Article 27.3 (b) says that the governments can exclude certain kinds of inventions from patenting, i.e, plants, animals and biological processes. The Article however states that it is mandatory for WTO members to provide patent protection to micro-organisms and non-biological and micro –biological processes on the basis of three patent eligibility criteria<sup>12</sup>. Hence, this is a somewhat confusing statement which does not provide a precise or a unique method for member countries to follow.

It has identified that the most controversial provision in the TRIPs agreement is the one relating to patenting of life forms. Whilst this provision is a boon for biotech and agro-chemical companies of the North, it has "opened the floodgates for the piracy of genetic resources" and misappropriation of associated traditional knowledge from the South (*Farmers' Rights, 2005*). A number of researchers especially who are doing research in developing countries have expressed views in this regard.

Article 27.3 (b) of TRIPs agreement is perhaps the most controversial clause of the entire WTO agreement. It requires members to provide for the patenting of micro-organism and genetically engineered organisms. It allows them to exclude from patentability, plants and animals and essentially biological processes for the production of plants animals, though members must provide either patents or an "effective sui generis system" for plant varieties (*Sahai, 2000*).

A sui generis (of its own) system of protection is a special system adapted to a particular subject matter, as opposed to protection provided by one of the main systems of intellectual property

<sup>12</sup>[www.wto.org](http://www.wto.org)

protection, e.g., the patent or copy rights system (Sahai, 2000). Further, it is a mild or a diluted form of a patent and it provides a framework of plant breeder's rights through which protection is accorded to the breeders, researchers, and farmers with regard to use and exchange of seeds and plant genetic materials (Shanker, 1996).

The sui generis regime was established at the international level in the 1960s, with the adoption of the UPOV. This regime introduced a number of minimum standards for the recognition of breeder's rights and prohibited the simultaneous use of patent and sui generis protection for plant varieties (The TRIPS agreement, A guide for the South, 1997).

Despite it having no clear provisions for the protection of animal and plant varieties, including microorganisms, TRIPs agreement, in clever legal language, obliges members to provide some kind of effective protection through a *sui generis* (one-of-a kind system), a patent, or both. This provision of the TRIPs agreement made it very important to agriculture.

Although TRIPs agreement excludes plants and animals from patentability, members are required to provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof. Given the significant contribution of agriculture in Asian economies, and its very rich biodiversity, the impact of this provision on Asian agriculture cannot be overlooked. Furthermore, the rapid developments in biotechnology, and its tremendous application to agriculture in Asia, may justify the inclusion of IPRs in agricultural trade (Beronio, and Payumo.2002).

In working out an "effective sui generis system" for plant varieties, there is considerable room for co-operation and harmonization of legislation between developing countries, the majority of which have not yet adopted any kind of protection for plant varieties (The TRIPs agreement, A guide for the South, 1997). From a Sri Lankan point of view, it is still in the process of introducing effective sui generis system to protect plant varieties.

Protecting Plant Breeders' Rights (PBR), also known as Plant Variety Rights (PVRs) are similarly important as protecting plant varieties. PBR are intellectual property rights granted to the breeder of a new variety of plant (or to another person or entity that can claim title in the new plant variety by, for example: agreement with the breeder or inheritance from a deceased breeder).

However, the TRIPs agreement provisions do not seem to contemplate a plant breeders' right as authorized by the Union for the Protection of New Varieties of Plants (UPOV). Proof of this is the fact that the TRIPs agreement provisions referring to plant varieties is under the section on patents. Moreover, there is no provision similar to the UPOV's farmers' rights, except for the general exception on the use of patents (Rajepakse, 2007). The UPOV system, however, is perceived as an easy to get but provides a weak IPR protection, and may not be applicable to all countries. TRIPs agreement, on the other hand, provides some kind of a double protection for new plant varieties, through a patent or a sui generis system (Trade Insight, 2007)

## **6. Country Case Studies**

This section compares four country case studies to identify the international best practices to protect new plant varieties, farmers' rights and their traditional knowledge. Selected countries are USA, Australia, Thailand and India. The basic reasons behind this selection are; USA and Australia are developed countries and have been protecting new plant varieties under plant variety protection legislations for many years. Thailand and India are developing countries and consist with subsistence agricultural system which is similar to Sri Lanka. Moreover, plant variety protection legislations become important in these two countries with the ratification of the TRIPs agreement. Further, when drafting laws for new plant variety protection, these two countries have considered other issues such as farmer's rights, traditional knowledge of farmers' etc. and these two countries are far ahead in implementing laws when compared to Sri Lanka.

### **6.1 Australia**

#### ***Agricultural system in Australia***

Farming in Australia is highly industrialized. The main reason for agricultural industrialization is the large corporations which dominates the market. These corporations determine the process of agricultural production and provide the necessary raw material such as seeds and fertilizer for growing of food (*Alexandra, 2001*). Approximately 70 per cent of Australian farms are still family owned and many farmers are becoming 'out workers' for large agribusiness by providing specific good or services for such business.

At present 70 per cent of the research and development of new plant varieties in Australia are undertaken by public organizations and most of them are funded by licensed foreign and local seeds companies. Public sector organizations are increasingly dependent on external funding and there are a number of seed companies, including subsidiaries of multi nationals, which identify themselves as commercial entities.

In Australia, around 80 per cent of agricultural production is exported, and about 60 per cent of this is derived from plants. The Australian agricultural sector is still deeply marked by the effects of past practices. Traditionally most plant propagating material used in Australia have been produced in Australia and, conversely, most Australian produced plant propagating material are used locally.

#### ***Intellectual property legislations relating to the agricultural sector in Australia***

Australia's Intellectual Property regime which is relevant to agriculture is consistent with the international agreements to which it is a member, in particular WTO's TRIPs agreement and the UPOV. The most important forms of domestic plant intellectual property protection are plant breeder's rights and patents (*Alexandra, 2001*).

Patents Act 1990 administered by Intellectual Property office in Australia. According to the Act all technologies may be patented with the exception of human beings and the biological processes for their production. Biological processes for the production of plants and animals can

be protected by patents. The Act gives a patent holder the exclusive right, for a limited term of 20 years, to 'exploit' a patented invention in Australia, after which time the knowledge embodied in the invention enters the public domain. The right to exploit includes the right to make, hire, sell, use or import the invention, and/or authorize another person to do so (*Alexandra, 2001*).

The second one is Plant Breeder's Rights Act 1994 which is administered by the Plant Breeder's Rights Office. Under this Act breeders are granted the exclusive commercial right, again within a limited period, to market a new plant variety or its propagating material, which includes producing, selling and reproducing the new variety or material (*Alexandra, 2001*). Breeders' right, it is for a new variety of plant that they have bred by genetic crossing of 'natural' plant varieties. Under this Act people, companies or organizations can be granted certain exclusive rights in a new variety of plant that they have produced. These rights allow them to sell the new plant variety or its reproductive material, and to further develop it for commercial purposes. The exclusive rights in plant varieties can last for up to 25 years.

These two important Acts provide special protection to plant varieties and farmers in different ways. Plant breeder's rights apply to plant varieties whereas patents do not apply to plant varieties. Plant breeder's rights provide ownership rights over the plant variety no matter what purposes plants of that variety are used for. However, patents can be broader in their application than plant breeder's rights (and therefore more attractive). The patent for the insect-resistance producing gene sequence will hold for all plants, of any type, into which it is inserted, while a plant breeder's right holds only over plants of a particular type<sup>13</sup>.

## 6.2 USA

### **Agricultural system in USA**

There are two farming sectors in USA namely; 'family farming' and 'corporation farming'. Family farming is an agricultural production unit, economically adequate to produce the modern United States standard of living for the farmers. Corporation farming business owns many farms but do not necessarily play a role in the working of the farm.

In past, American farmers played a prominent role in introducing and developing in plant varieties. Most seeds were grown on private or communal farms, and the seed from the best plants were saved for the next year's crop. At that time the wealthier landowners imported large quantities of seeds from Britain and distributed this to the agricultural society. However, this seed was not accessible to the common farmers as the membership of these societies was limited to the selected groups. Gradually, the many USA agricultural experimental stations developed and evaluated inbred lines<sup>14</sup> and hybrids<sup>15</sup>. The emergence of hybrid seeds afforded the industry some production, thereby creating incentives for research. Later biotechnological developments in plant breeding paved the way for the development of more sophisticated crop varieties.

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<sup>13</sup>Patents and Plant Breeder's rights in Australian law , available at; [www.desertknowledgecrc.com.au/.../DKCRC-SS-BP4-Patents-and-plant-breeders-rights-in-Australian-Law.pdf](http://www.desertknowledgecrc.com.au/.../DKCRC-SS-BP4-Patents-and-plant-breeders-rights-in-Australian-Law.pdf)

<sup>14</sup> Inbred lines refer to breeding from a closely related crop especially over many generations.

<sup>15</sup> Hybrid describes progeny resulting from a cross between two genetically non- identical individuals.

## ***Intellectual property legislations relating to the agricultural sector in USA***

In USA there are three types of protections available for plant varieties. They are; Plant Variety protection Act 1970, Plant Patent Act 1930 and Utility Patents under the general patent law. The first two are patent legislation that offers protection for plants and the third one provides protection in the form of plant breeder right.

In USA intellectual property protection for plants goes back to 1906 when a bill to amend the laws of USA relating to patents in the interest of the originators of horticultural products was presented to congress on three occasions but the Bill did not become law<sup>16</sup>. The intellectual property systems have facilitated the commercialization of plant innovation by offering specialized protection regimes for specialized circumstances. In 1930, the U.S. Congress created a "plant patent" regime designed specifically to provide rights against unauthorized asexual propagation, a serious problem in the nursery industry. Plant Patent Act provides protection to asexuality<sup>17</sup>, seedless reproduced plants and plant varieties.

The main body of law concerning patent is found in Title 35 of the US code. Under USA patent law; 'utility' patents are issued for four general types of inventions, discoveries, machines, human made products processing methods etc. Utility patents grant the owner a right to exclude others for twenty years from the filing date from making, using, offering for sale, selling within the USA or importing into the US patented invention as defined in the claim.

In 1970, Congress created a "plant variety protection" regime that is tailored to provide limited rights against duplication of protected varieties via seeds, a matter of obvious importance in the commercialization of crop plants<sup>18</sup>. This Act provides sui generis protection for plants that are sexually reproduced (plants reproduce by seeds). The main purpose of this Act was to encourage the development of novel varieties in sexually reproduced plants and to make them available to the public, by providing protection to those who breed, develop or discover them and thereby promoting progress in agriculture in the public interest.

### **6.3 Thailand**

#### ***Agricultural system in Thailand***

In Thailand there are three types of farmer groups; crop farmers, fruit growers and orchid growers. Rice and corn farmers are prominent in crop farmers. Farming system in crop farmers has been changed over last two decades. Earlier farmers used human labour and buffalos in agriculture and with the developments in technology now they have shifted to more machinery

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<sup>16</sup>Intellectual property rights for plant breeding, available at; [www.molecular-plant-biotechnology.info/...intellectual-property...Intellectual-property.../intellectual-property...plant.../intellectual-proper](http://www.molecular-plant-biotechnology.info/...intellectual-property...Intellectual-property.../intellectual-property...plant.../intellectual-proper)

<sup>17</sup> Asexual reproduction is the propagation of a plant by such means as tissue culture propagation, grafting, budding, cutting, layering, division but not from seeds which is a sexual process.

<sup>18</sup>Plant breeders rights, available at; [www.ipmenu.com/country/usa.htm](http://www.ipmenu.com/country/usa.htm)

used agriculture system. Earlier farmers used traditional varieties of rice corn but many farmers today have moved to hybrids as traditional varieties have been unproductive.

In Thailand plant breeding is undertaken by both public and private sector. Rice and corn varieties are the staple food crops in Thailand. At present the Rice Research Institute within the Department of agriculture of the Ministry of Agriculture and cooperatives control all rice research and development in Thailand. Almost all new varieties used in Thailand have come from public sector. Thai government is reluctant to encourage private sector in involve in rice research because of the multinational company involvements. Corn seeds are distributed by two channels – the public and private sector. The public sector consists of government agricultural officers, Crop Research Institute and Universities. The private sector is engaged in breeding hybrid corn and the government has taken a policy decision not to compete with the private sector<sup>19</sup>. At present seed companies are selling seeds to the subsidized market and the open market. In Thailand there is a demand for fruit and orchid varieties. Government support for fruit and orchid is very minimal. Most orchid growers used to obtain orchid bunches from native forests. There is no private sector involvement in fruit and orchid varieties.

#### ***Intellectual property legislations relating to the agricultural sector in Thailand***

The most important legislation for plant protection in Thailand is ***The Plant Protection Act 1999***. As a member of the WTO, Thailand has to promulgate the Plant Protection Act to comply with the WTO and TRIPS Agreements. The Act was based on the UPOV Convention 1978, FAO and CBD. It protects both new breeds of plants and local plants. Local plants may also be categorized as Specific, General or Wild Plants. Compensation to a legal person was also provided for in the Act<sup>20</sup>.

### ***6.4 India***

#### ***Agricultural system in India***

Farming in India is predominantly subsistence farming and the farming community is the largest seed producer, providing about 85 % of the country's annual requirement of over 6 million tons of seed. Both public and private sector are engaged in research and development in breeding varieties. Indian Agriculture Research Institute is one of the most important government organizations in developing plant varieties. It has developed a number of hybrid varieties, grains and vegetables using crop improvement and genetic engineering techniques. In addition to the public sector organizations, India has a number of non-profit NGOs whose objective is to produce varieties for public good.

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<sup>19</sup>Thai patent threat despite Monsanto ban, available at [www.grain.org](http://www.grain.org).

<sup>20</sup>Report of the Inter-Regional Workshop on Intellectual Property Rights in the Context of Traditional Medicine - Bangkok, Thailand, 6-8 December 2000, available at; <http://apps.who.int/medicinedocs/en/d/Jh2944e/7.2.htm>

### ***Intellectual property legislations relating to the agricultural sector in India***

India is one of the first countries in the world to have passed a legislation granting rights to both breeders and farmers under the Protection of Plant Varieties and Farmers' Rights Act, 2001. India's Act allows four types of varieties to be registered reflecting the interests of actors: New Variety, Extant Variety, Essentially Derived Variety and Farmers' Variety<sup>21</sup>. This Act grants the protection for Indian breeders and farmers the right to claim intellectual protection over their varieties. This Act was a direct outcome of India's commitment under the TRIPs agreement. As the Indian Patent Act in 1970 excludes of living organism; the other option under the TRIPs to protect plant varieties by Plant breeder's rights was adopted by India. Indian policy makers get ideas from UPOV convention when preparing the Act.

According to the TRIPs agreement one way of providing protection to plant varieties is through patents. Globally few developed countries like USA and Australia provide protection for plant varieties not only by PBR but also through patents. The main reason for choosing patents for protection is due to their technological capabilities and the immense financial benefits that a patent system is expected to generate. However, it should be noted that the patent system is much more difficult to establish in inventions relating to plants than the criteria adopted in plant breeder's rights. Patent protection is stronger than that offered by the plant breeder's rights as the patent system does not recognize the farmer exemption that allowed farmer's to use patented seeds, but not the research exemption where future researchers are allowed to use patented plants to conduct research and breed novel varieties.

Being developing countries India and Thailand have subsistence agricultural system where governments provide subsidies to farmers to purchase seeds and fertilizer. In both these countries farming is not a commercial activity but a livelihood. Therefore, it needs to formulate their national laws, a broader farmer's privilege for the benefit of subsistence farmers who customarily reuse seed due to lack of access to protected varieties, lack of technology to improve it further and financially instabilize to purchase new seeds.

### **7. Laws and policies relating to plant varieties and farmers' traditional knowledge in Sri Lanka**

Sri Lanka has already implemented some rules and regulations with regard to protect plant varieties and farmers' traditional knowledge. Most of these Acts and Ordinances are deals with natural resources which collectively indicate a policy in favour of physical protection of natural resources, but are not specific laws relating to plant genetic resources and farmers. Most of these laws were passed many decades ago.

Sri Lankan intellectual property law followed the British law on intellectual property until 1978. Since signing the TRIPS Agreement, the Government of Sri Lanka is obliged to introduce rules and regulations to protect plant varieties and breeders rights. Having such laws are necessary to

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<sup>21</sup>India's plant variety and farmers' rights legislation: potential impact on stakeholder access to genetic resources available at; <http://ideas.repec.org/p/fpr/eptddp/96.html>

attract new and advanced technologies and to provide incentives to plant breeders. Sri Lanka needs to improve its agricultural technologies to meet the increasing food needs of the growing population.

Sri Lanka passed its Intellectual Property Act No.36 in 2003 to comply with the TRIPS agreement. However, this law does not have a direct bearing on biodiversity and farmers' rights as it does not allow for the patenting of plants

### **7.1 *Intellectual Property Rights act No. 36 of 2003***

The intellectual property rights act No: 36 of 2003 is replaced the code of Intellectual Property Act No: 52 of 1979. This act has introduced several types of property rights including copy rights, related rights, expression of folklore, industrial designs, marks, patents, unfair competition, undisclosed information, geographical indication etc.

According to this act, it states that “plants, animals and other micro-organism other than transgenic micro-organism and an essentially biological process for the production of plants and animals other than non-biological and Microbiological processes shall not be patentable” (Section (62.1)). However, an invention can be patentable if it is new, involves an inventive step, and is industrially applicable. Thus, identifying new plant varieties can be identified as a new innovation and can be patentable.

Further with regards to the traditional knowledge of farmers' the act states about expression of folklore. Section 24 of the Act offers a sui generis form of protection to the expression of Sri Lanka's folklore. And the section 5 of the Act says that “Expression of folklore can be identifies as a group oriented and tradition based creation of groups or individuals reflecting the expectations of the community as an adequate expression of its cultural and social identity , its standards and values as transmitted orally by imitation or by other means.

### **7.2 *Fauna and Flora Protection Ordinance as amended by Fauna and Flora Protection (Amendment) Act No: 49 of 1993***

This ordinance dating from 1937 provides for the protection of “National Reserves” which are sub-classified into various types that attracts different levels of protection. The most stringently protected area is the “Strict Natural Reserves” of which only there are three, namely Hakgala, Ritigal and Yala (part). Further down the ladder of protection are the NaturalPark, Natural Reserve, Jungle corridor, refuge, Marine Reserve and Buffer zone (list as amended by the 1993 Act). In respect for strict natural reserves, no person other than an official of the Department of wild life conservation may enter or remain therein except with the written permission of the Director General.

### **7.3 Forest Ordinance as amended in 1995**

This Ordinance deals with the protection of forests and the regulation of the felling and transportation of timber. It has been amended several times; most recently in 1995. Under this Ordinance “forest” means all forest, waste, *chena*, uncultivated or unoccupied land at the disposal of the State. More stringent levels of protection apply to “reserved” and “conservation” forests, both of which are required to be declared by Ministerial order and published in the Government Gazette. This Ordinance also protects “reserved trees” whether found on forest land or not. No cutting, making, looping, girdling, tapping or injuring of any reserved trees is allowed except in accordance with Rules made by the Minister. The Ordinance contains a schedule of reserved trees. Which provide protection for natural resources?

### **7.4 Rubber Control Act/ Tea Control Act**

Under these two Acts it is prohibited to export from Sri Lanka “any seed, root, stump or bud” of any rubber plant or tea plant, without a permit from Rubber Controller or Tea Controller, as the case may be. These provisions have effect “as if they were part of the Customs Ordinance” and thus they are enforceable by Customs officers at the point of exit.

### **7.5 Plant Protection Act No: 35 of 1999**

This Act replaced the Plant Protection Ordinance dating from pre independence times, but kept in force all regulations gazetted under that Ordinance that were not inconsistent with the provision of the Act. The purpose of the Act is made clear in its long title which states that it is “*An Act to make provision against the introduction into Sri Lanka and the spreading therein, of any organism harmful to or injurious to or destructive of plant and for the sanitation of plants in Sri Lanka.*” The Director-General of Agriculture is in charge of the general administration of this Act and he may nominate one or more “Authorized officers” for the purpose of giving effect to the Act.

The Director General or authorized officer may enter any premises” for the purpose of ascertaining whether there are “pests”. Such officer is authorized to give directions to the importer of the pests or the owner or the occupier of the premises so as to prevent the pest from spreading. Under the part IV of the Act there is a right of appeal to a panel of scientists.

There is also provision in part III to allow the importation of “quarantine pest” or a plant or plant product infested with such pest, for the purpose of scientific study by “a government department or public corporation engaged in scientific research” if there are “proper facilities including trained personnel” for the containment and quarantine of the same. A “quarantine pest” is defined in section 15 as a pest of “potential economic or Environmental importance to any area with in Sri Lanka”.

The plant protective Act is thus a defensive piece of legislation designed to protect Sri Lanka’s plant and plant products from contamination by pests outside, while not shutting the door to

using selected pests beneficial potential for scientific purposes. It is of importance to farmers to the extent that it seeks to prevent contamination of local agricultural crops by invasive species not hitherto found in Sri Lanka.

#### **7.6 *Seed Act No 22 of 2003***

This is an Act to regulate the quality of seed and planting materials and to provide for matters connected therewith or incidental thereto. National seed council was established under this Act. Functions of the council can be identified as follows;

- To establish guidelines and principles to ensure production and distribution of seed and planting materials of the highest quality
- To undertake periodic review of the progress of seed and planting materials production
- To advice the Minister and other relevant authorities on all matters regarding the production of quality seed and planting materials and the supplying of seed and planting materials industry
- To establish appropriate minimum limits for germination viability genetic purity, physical purity and appearance of seeds and planting materials and maximum limits for impurities, damaged seeds, water content and pests (including weed seeds) allowed in seeds available in the market.
- To determine the quality and minimum labeling requirements for seed containers and for planting materials available in the market.
- To take appropriate action with regard to the protection of new plant varieties

Similarly, Sri Lanka has ratified several international conventions regarding plant varieties and farmer's rights

#### **7.7 *UN Convention on Biological Diversity (CBD)***

This was adopted in 1992 and came into force in 1993. Sri Lanka ratified it in 1994, which was basically focused on conservation of biological diversity.

The objectives of the convention are the conservation of biological diversity, sustainable use of genetic resources and the fair and equitable sharing of benefits from the use of genetic resources. It is important to note that although the CBD deals with the conservation of biological diversity, the scope of access and benefit sharing is narrowed down to genetic resources. this convention defines genetic resources as genetic material with actual or potential economic value; a definition that is not based on science but on commercial value.

The CBD does not call for any direct action from members. Rather it provides a set of policies and objectives and members can take necessary action within the context provided. It therefore acts as framework convention. In this regard The CBD provides a set of responsibilities for the conservation of biological diversity and sustainable use, access and benefit sharing as well as a set of corresponding rights.

Although the scope of CBD is to cover all types of genetic resources, there is an important exception that serves as an exclusive clause. This is article 15.3 which says that the provisions of articles 15, 16 and 19 apply only to those genetic resources “acquired in accordance with the convention.” This, in other words, excludes all the ex-situ collection that have been acquired before the ratification of convention which accounts for the majority of the ex-situ collections held in almost all the gene banks in the world. This is a great disadvantage to a country like Sri Lanka which has readily and freely donated crop germplasm to others for more than four decades.

### **7.8 *Proposed Act on New Plant Varieties 2011***

The proposed act will provide protection for new plant varieties and rights of farmers, plant breeders, researchers, to encourage the development of new varieties of plants. The Director General of Agriculture and the Director General of Intellectual Property Office are the main administrative officials of the act.

Furthermore, it has given interpretations for a ‘breeder’, ‘a farmer’, ‘a variety’, ‘breeder seeds’ etc. which were not addressed in existing laws. And also it attempts to fill gaps in the present plant variety registration system by providing proper system to ‘registration of a new variety’, ‘how to apply for a new variety’, ‘how to examine registration applications’ etc. And also it discusses about compulsory licencing system. The proposed Act has identified some of the existing issues with regards to the new plant variety registration and providing legal protection for the same.

It was stated that most farmers presently depend on the hybrid varieties of seeds for higher yields. Providing possibilities for new plant breeders by protecting their rights is a necessary step in achieving these developments. An effective and productive intellectual property system is considered as an important component for a nation’s advancement (Abeysekera, 1999).

## **8 Results**

Data analysis is based on perception survey data, key informant interviews and farmer focus group discussions. The perception survey questionnaire covered significant aspects of the TRIPs agreement and its importance to the Sri Lankan agricultural sector. The main purpose of the questionnaire was to get stakeholders’ views on IPRs and its impact to Sri Lankan agricultural sector. Respondents had to rank their views on the questions given and they were provided numbers 1 to 5, based on the Likert Score System. They were required to tick or highlight the number in their opinion best represents the strength of the rules and regulations (or the statement) available in Sri Lanka to protect new plant varieties and farmers traditional knowledge. The lowest number (0) represents the most ineffective whereas the highest number (5) represents the most effective. If a respondent’s view to a questions asked is ineffective he/she will mark it as 0, whereas if it is a favourable answer, or if he/she thinks the said statement is highly effective he/she will mark it as 5. Similarly, if they have moderate views they will record them between 1-5. Analysis is based on the average of all selected stakeholders whereas some

selected questions were analyzed based on stakeholder groups. There were thirty filled questionnaires received from policy makers, academia, government officials, lawyers etc.

The most significant question in the questionnaire was to identify the best possible protection method for Sri Lanka new plant varieties and farmers' traditional knowledge. The TRIPs agreement suggests two options namely: Patents or Sui generis system. Some selected stakeholders have suggested Sui generis system as the most appropriate method for Sri Lanka. Even though patent protection is an effective method, Sri Lanka being a developing country is faced with severe financial constraints in establishing a patent system for inventions. Sui generis is a weaker system than patenting, whereas in Sui generis system the right holders can only prevent third parties from commercially exploiting the protected material. Considering the country's agricultural, farming and economic system, 62 per cent of the stakeholders ranked sui generis as the best possible method for Sri Lanka whereas 38 per cent of them have identified patent system as the best protection method.

The data were mainly collected from both primary and secondary sources such as Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs). FGDs and KIIs revealed detailed information on the nature of problems faced by dairy sector in Sri Lanka and further, provided some recommendations too.

FGDs were carried out (including the pilot FGD) based on a semi-structured questionnaire (Appendix 3: Focus Group Discussion Guidelines). On average, 12 -15 traditional/ non-traditional farmers participated in each FGD. Participants were basically selected with the support of the Department of Agriculture and Department of Agrarian services. The key informant interviews were conducted face-to-face using a semi-structured questionnaire (Appendix 2: KII guidelines). Key informants included government officials, private sector producers, processors, and importers who have field level experiences and knowledge on the subject area.

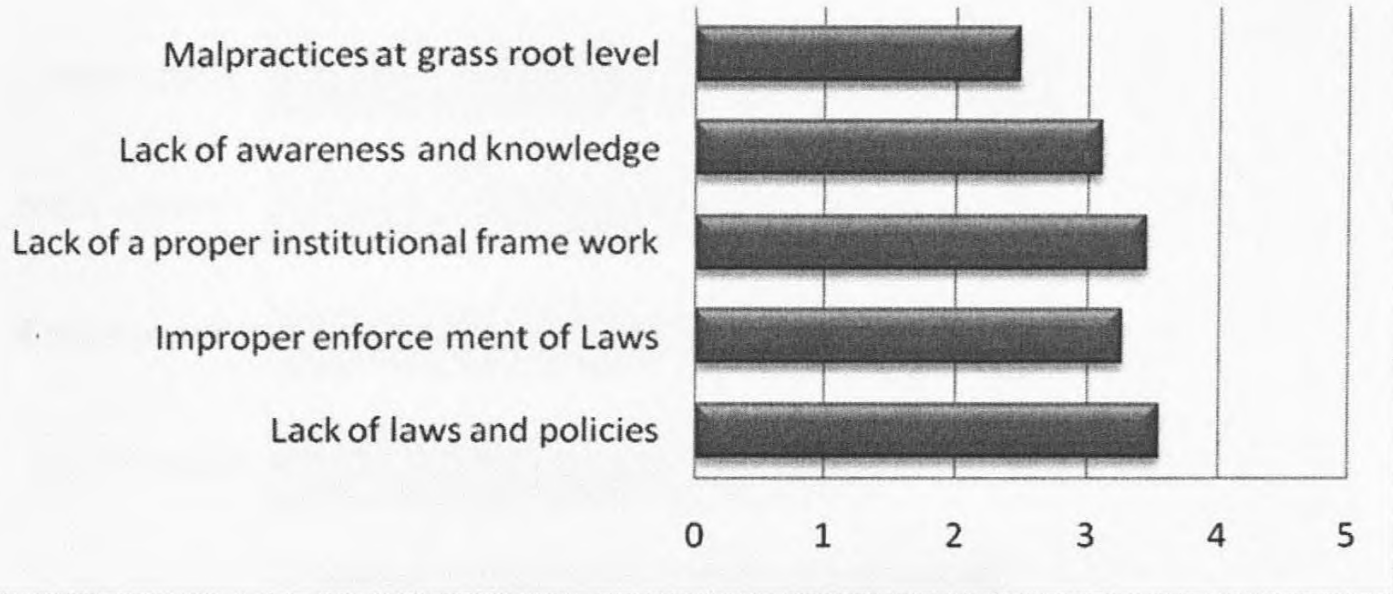
**Figure 4 : Photographs of Selected Focus Group Discussions**



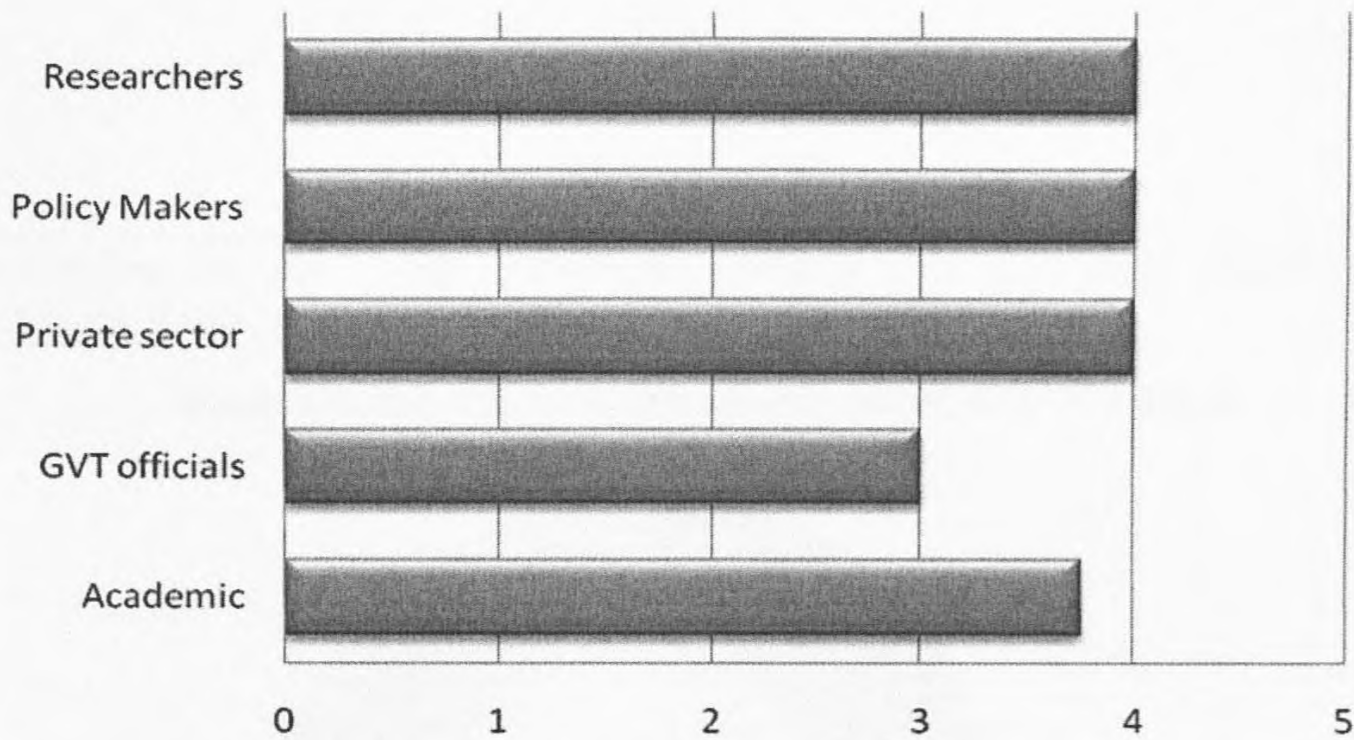
FGDs and KIIs were digitally audio recorded (with permission). All voice recorded interviews were transcribed, and translated Sinhala to English. The transcripts then uploaded to NVivo10, software widely used for qualitative data analysis. NVivo is a powerful way to do sophisticated data coding and it supports several ways to build theories, either local or more general. NVivo is also very helpful in easily organizing different data types and sources used in the Study (Ozkan, 2004).

**Table 3: Main findings from KIIs & Perception Survey**

<b>The main areas discussed in perception survey, and KIIs</b>	<b>Main findings</b>
<i>What are the issues facing Sri Lanka in protecting plant varieties and farmers' traditional knowledge</i>	The main issue identified was the lack of a proper institutional framework. The second most important issue was the lack of laws and policies relating to new plant varieties and farmers' traditional knowledge whereas the third factor was the improper enforcement of laws. The hindrance on the implementation process is mainly due to lack of strong and powerful institutions and a very low demand for same from the civil society. Thus, the use of available laws and regulations are very limited. Lack of awareness and knowledge at grass roots levels was emphasized as the fourth factor. Malpractice at grassroots level is ranked as the final issue. All of these issues are inter-linked with each other.

	<p style="text-align: center;"><b>Issues face by Sri Lanka in protecting new plant varieties and farmers traditional knowlege</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <caption>Data for Issues face by Sri Lanka</caption> <thead> <tr> <th>Issue</th> <th>Rating (0-5)</th> </tr> </thead> <tbody> <tr> <td>Malpractices at grass root level</td> <td>2.5</td> </tr> <tr> <td>Lack of awareness and knowledge</td> <td>3.1</td> </tr> <tr> <td>Lack of a proper institutional frame work</td> <td>3.4</td> </tr> <tr> <td>Improper enforce ment of Laws</td> <td>3.2</td> </tr> <tr> <td>Lack of laws and policies</td> <td>3.5</td> </tr> </tbody> </table>	Issue	Rating (0-5)	Malpractices at grass root level	2.5	Lack of awareness and knowledge	3.1	Lack of a proper institutional frame work	3.4	Improper enforce ment of Laws	3.2	Lack of laws and policies	3.5
Issue	Rating (0-5)												
Malpractices at grass root level	2.5												
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Improper enforce ment of Laws	3.2												
Lack of laws and policies	3.5												
<p><b>Why IPRs are important in Agriculture sector</b></p>	<p>The respondents (58% out of 100%) have stated that the international trade accelerates with strong IPR and 42 % of them have identified the importance of IPRs in stimulating investments.</p>												
<p><b>The importance of IPR system for Sri Lankan agriculture(This question was analyzed according to respondents categories)</b></p>	<p>Policy makers who represent the Directors of the Department of Agriculture, Intellectual Property Rights office, and from several Ministries have identified the importance of IPRs in agricultural development of a country and have provided an average of 4. Government officers who represent Department of Commerce, Ministry of Fisheries and Aquatic Resources, Ministry of Agriculture and Agrarian Services, and the Central Bank have ranked it as 3. Which is low compared to other categories. Academia category which involves university lecturers and private sector has indicated the importance as 3.75.</p>												

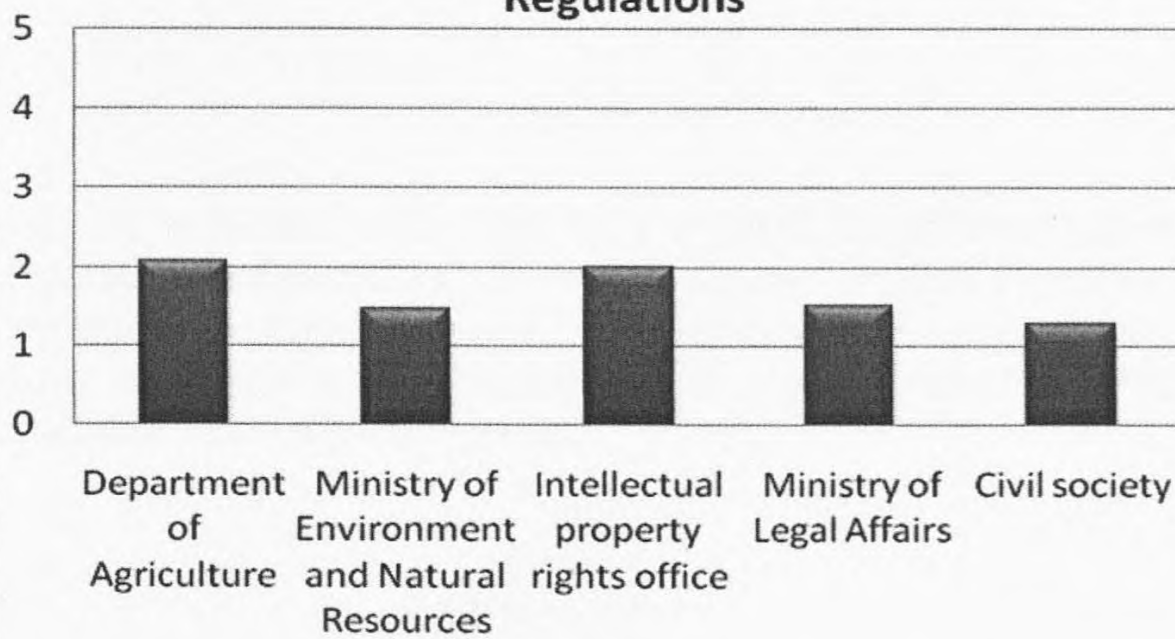
**Importance of IPR system for Sri Lanka as Percieved by differant stakeholders**



**The institutions which are responsible in preparing IPR rules**

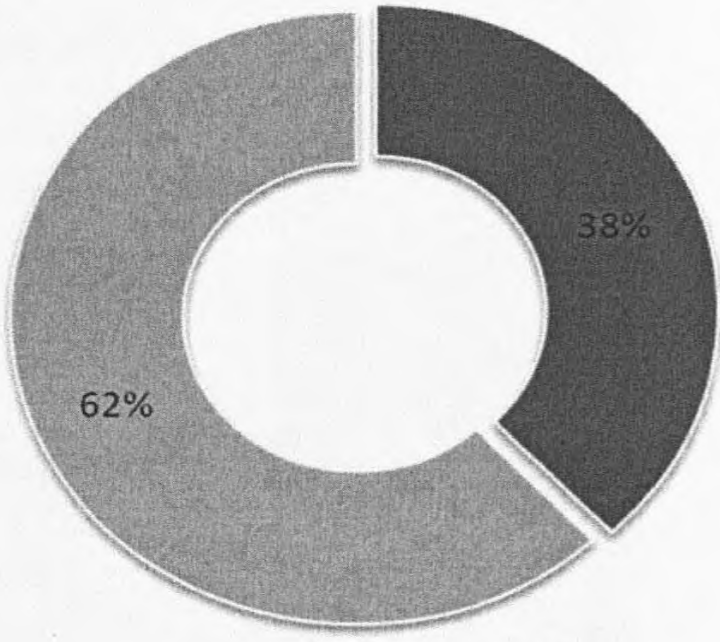
According to stakeholders rankings, the responsible institutions and groups in making IPR rules for the agricultural sector are as follows; Department of Agriculture, Intellectual Property Office, Ministry of Legal Affairs, Ministry of Environment and the civil society.

**Institutions Responsible for Making IPR Rules & Regulations**



**Does the present Act on Intellectual**

It doesn't cover the IPR aspects in agriculture and also it doesn't provide sufficient protection for new plant varieties. Further, the support given by this Act for research and development in the agricultural sector is very

<p><b>property rights (2003 IPR Act) in Sri Lanka, provide protection for new plant varieties and farmers?</b></p>	<p>minimal.</p>						
<p><b>Identifying the main stakeholders in improving new plant varieties</b></p>	<p>According to the data gathered, farmers are the main stakeholders in improving the new plant varieties.</p> <div data-bbox="436 747 1852 1564" style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>Main Stakeholders In improving plant new varieties</b></p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Stakeholder</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Farmers</td> <td>62%</td> </tr> <tr> <td>DOA</td> <td>38%</td> </tr> </tbody> </table> <p style="text-align: center;">■ Farmers ■ DOA</p> </div>	Stakeholder	Percentage	Farmers	62%	DOA	38%
Stakeholder	Percentage						
Farmers	62%						
DOA	38%						

Nvivo qualitative analysis software was used to analyse data gathered from KIIs and FGDs. Several nodes were created based on KII & FGD guidelines. Figure 5 explains created nodes to analyse gathered information. It shows that most of KIIs and FGDs were given priority to discuss issues faced in protecting new plant varieties and farmer's traditional knowledge and less priority given to discuss on available laws and rice seeds.

**Figure 5: Nodes compared by number of items coded**

Nodes compared by number of items coded

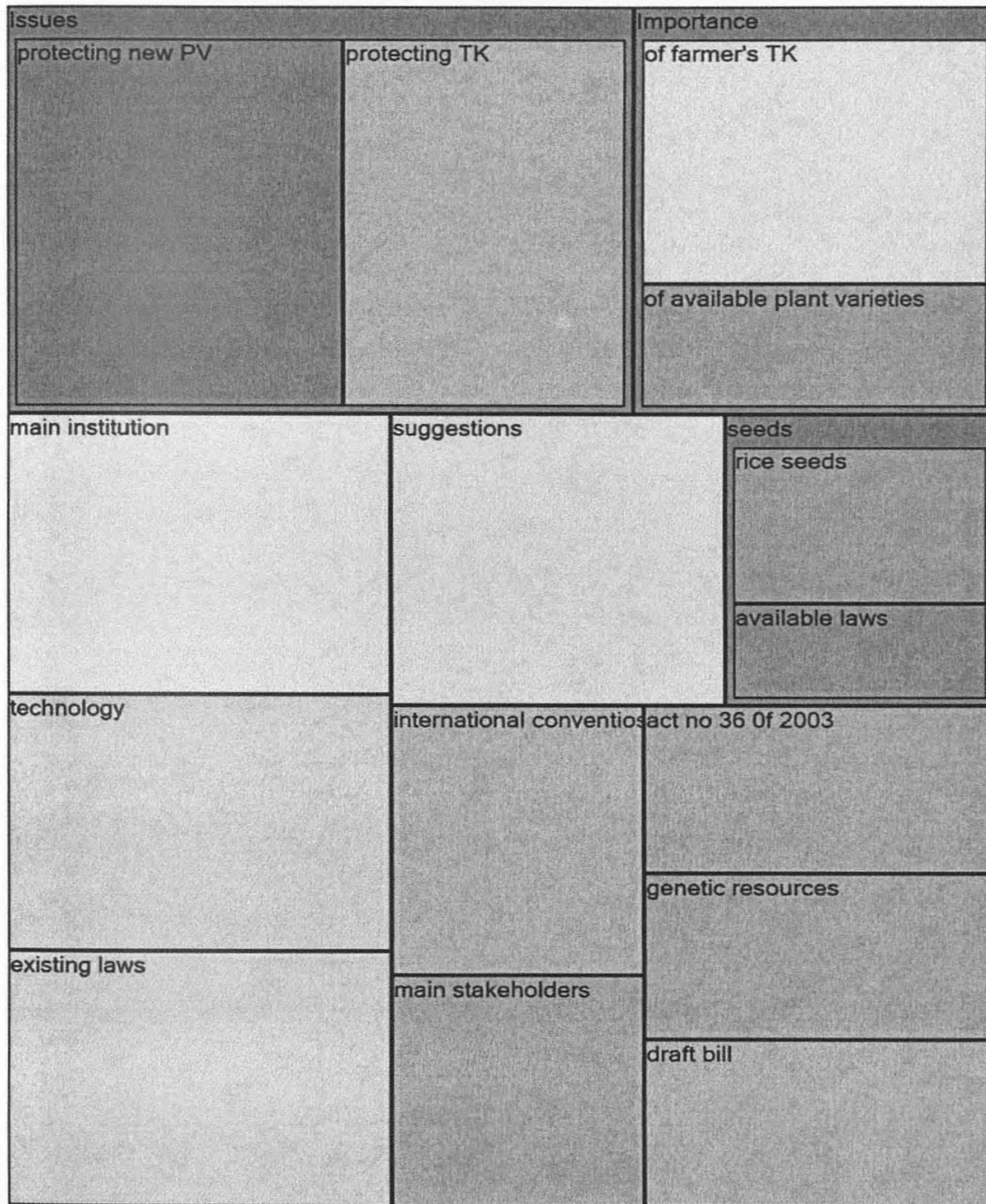


Table 4 explains matrix analysis of identified issues in protecting new plant varieties and farmers' traditional knowledge and it highlights that whether these issues are addressed in the existing law system or whether the existing laws provide solutions for those identified issues.

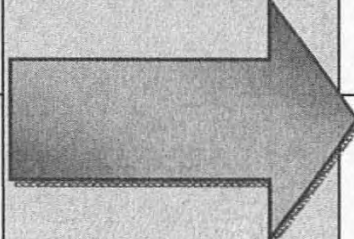
**Table 4: Matrix Analysis on Identified Issues and Existing Laws**

No	Existing Laws	Intellectual Property Rights act	Fauna and Flora Protection (Amendment) Act	Forest Ordinance as amended in 1995	Rubber Control Act/ Tea Control Act	Plant Protection Act No: 35 of 1999	Seed Act No 22 of 2003	UN Convention on Biological Diversity (CBD)	Proposed Act on New Plant Varieties
Identified Issues									
1	Lack of plant breeders interest	x	x	x	X	x	x	x	Yes
2	Lack of understanding and commitment by the government	x	x	x	X	x	x	x	X
3	Poor coordination among relevant organizations	x	x	x	X	x	x	x	x
4	No DNA bar coding available to confirm the genetic identity of varieties	x	x	x	X	x	x	x	Yes
5	Lack of incentives for plant breeders	x	x	x	X	x	x	x	yes
6	Difficulties of obtaining good exotic genetic materials from other countries	Yes	x	x	X	Yes	Yes	Yes	Yes
7	Lack of authentic information and regulating body	x	x	x	X	x	x	x	x
8	Drafting and implementation of related legislation are long overdue	x	x	x	X	x	x	x	x
9	Capacity and funds are increasingly lacking	x	x	x	X	x	x	x	Yes
10	There is no reward system for breeders	x	x	x	X	x	x	x	Yes
11	Our genetic variation is low. Thus, we need to exchange seeds with other countries	Yes	x	x	X	x	x	x	Yes
12	Seed exchange is restricted to a certain extend as we can't show our ownership	Yes	x	x	X	x	Yes	x	x
13	No legal framework to get ownership. Therefore, exchange of germplasm is difficult	x	x	x	X	x	x	x	Yes
14	No coordination between farmers, researchers, policy makers etc.	x	x	x	X	x	x	x	x

It is clear that most of the identified issues are not being addressed by the existing laws. The issue on 'importing exotic materials from abroad' is covered by some of the existing laws and also seed exchange within countries also covered by IPR act 2003 and seed act 2003. However, the proposed act on new plant varieties have mentioned about most of the identified issues.

The identified issues were presented at the expert consultation. The experts were consisted of main stakeholders in the sector. Table 5 explains the strategies and measures that they have proposed to overcome identified issues and responsible institutes in implementing these strategies.

**Table 5: A Matrix on Issues, Remedies and Responsible Institute**

Issues		Remedies	Responsible Institute
No formal procedure / law		Enactment of appropriate law	Department of Agriculture (DoA), Ministry of Agriculture (MoA), Intellectual Property Rights Office (IPRO)
Lack of plant breeders interest on Plant Variety Protection Rights (PVPR)		Make awareness on benefits of PVPR amongst breeders	DoA& Institute of Policy Studies (IPS)
Negligence of policy makers		Appoint a special committee to look into the matter	IPS/ MoA
Negative views for having PVPR from certain elements of the society		Make awareness of this benefits of PVPR specially at international level	MoA
No legislative coverage		No 36 of 2003 intellectual property act section 62 (3) stated that plant and animal cannot be patented. According to TRIPs agreement there are two options. First option:-we can't proceed. Therefore we have to establish Sui generis system	DoA, IPR office
Low investments for breeding of new varieties		Assurance of protection for reasonable period to recover the investment	Legal Draftsmen's Department
No incentives for the breeder who has actively contributed		Grant a honorarium for the breeder/s who have contributed for the breeding of commercialized variety	Legal Draftsmen's Department
Who is the technical body		Appoint a competent authority	Panel of National

responsible for authenticating the new variety				Registry
Farmer's rights		Assuring customary practices of farmers		Department of legal drafts' men, DoA

Source: Based on views presented at the expert consultation

According to the suggestions presented at the expert consultation, it is the responsibility of the Ministry of Agriculture, Department of Agriculture and the Intellectual Property Rights Office to propose appropriate new laws to protect new plant varieties and farmers' traditional knowledge. Further, Department of the Legal Draftsmen has the responsibility of drafting new laws or revising the existing laws to assure customary practices of farmers, provide allowances to breeders who introduce new varieties, provide protection for investments etc. It is important to create awareness on the importance of protecting new plant variety rights. Also it is utmost importance to encourage breeders to take necessary measures to protect their rights and also it is needed to change their attitudes on protecting new plant varieties as some of them do not value the importance of PVPRs. In addition, it is important to appoint a special committee or a group comprised of main stakeholders to authenticate new plant varieties, to maintain registry of new plant varieties etc. The expert consultation also highlighted the importance of IPS's involvement in working closely with the Ministry of Agriculture in several instances.

## 9. Conclusions

As a member of the WTO and as a signatory to the TRIPS agreement, Sri Lanka is required to implement rules and regulations to protect new plant varieties and farmers' traditional knowledge. However, the TRIPS agreement did not impose any restrictions on selecting the protection method. The governments have absolute discretion in selecting the most suitable method for their economies and to their agricultural patterns. Therefore, the countries have the opportunity to formulate their own systems depending on their current situation and future priorities. Hence, Sri Lanka had the flexibility in deciding the most suitable method and implementing it prior to the year 2006.

Sri Lanka implemented the Intellectual Property Act No: 36 in 2003 to comply with the TRIPS agreement. However, this Act has excluded patent protection for animals and plants. The intellectual property office together with the Ministry of Agriculture and other relevant officials drafted an Act on the protection of new plant varieties in the year 2011. However, due to criticism from experts in the field the said Act still remains at the Bill stage. Due to this delay in implementing laws to protect plant varieties and farmers' traditional knowledge, Sri Lanka is facing various difficulties in international trading and it is also in a perilous position in loosing its new plant varieties and farmers' traditional knowledge.

As discussed above, intellectual property protection promotes investments and international trade flows. Simultaneously, it plays a significant role in encouraging innovation, product development, and technical changes in the development process. It was identified that there is a positive relationship between IPRs and the economic development of Sri Lanka. Economic development of the country with IPRs happens through two channels namely; higher investments and international trade.

As a developing country Sri Lanka should take advantage of the arrangements provided by the TRIPS agreement and adopt a sui generis plant variety protection law that will support the development of the indigenous agriculture sector and subsistence farming communities.

The following recommendations are based on KIIs, perception survey conducted amongst selected stakeholders, farmer focus group discussions and the expert consultations. It is identified that there is an inter-link between issues that affect the implementation of rules and regulations to protect new plant varieties and farmers' traditional knowledge. It was further revealed that the sui generis system would be the most appropriate method for Sri Lanka. Therefore, under the TRIPS agreement, Sri Lanka has the flexibility to decide the most suitable type of PBRs, taking into consideration its agricultural economy and future objectives. The study has identified that the available plant varieties and farmers' traditional knowledge are important in the development process of agriculture, mainly to the rice seed sector. Therefore, it is necessary to prepare laws and regulations in conformity with TRIPS to protect new plant varieties and farmers traditional knowledge.

Furthermore, it is essential to increase general public awareness on this issue, and keep them updated as they are an entity that has a voice and the power to influence the government. As an example, in India it is the general public that demands the government to provide protection. Thus, it is important to have a separate unit or an institute to monitor these issues and to provide patents if needed. This institute should comprise of legal professionals and agriculture economists. Currently, farmers have to visit two institutions (DOA and NIPRs office) to address these issues. Finally, it is essential to implement the draft bill on plant protection without any further delay. This was highly emphasized during the expert consultations and the KIIs.

*“Conduct awareness programmes in farm organization levels, establish farmers' field school,  
Establish farms which are producing different varieties”*  
Policy maker at KII

*“My suggestions would be to strengthen the quarantine regulations and farmers Traditional knowledge would be to create organize programme, create awareness among different levels that is policy makers among scientists among extension officers as well as agriculture instructors and some level. There should be a forum farmers also come with their views and with the people who actually work in the labs”*  
Government Official – KII

Furthermore, considering the traditional knowledge engaged with the rice sector, it is important to document the available knowledge. Conduct awareness programmes in farm organization levels, establish farmers' field schools, and establish farms which are producing different varieties and farms for farmers who are presently using traditional knowledge. Moreover, it is important to protect grass root level traditional knowledge holders. Establish botanical gardens and research centres and attach them with schools and other educational institutes including universities. Protect traditional knowledge books available in any form. As some of the countries have already done Sri Lanka too can conserve traditional knowledge in a digital system. However, to create such a system Sri Lanka first needs to collect traditional knowledge with regards to the rice sector.

*“Traditional knowledge also needs to be documented in somewhere. Documentation is very tricky are. India has digital library what they use is they putting traditional knowledge into digital library and prevent other people from patenting because novelty taken up at the same time when you put into the public domain you also can't use it, you also can't get patented. That is why I'm saying in Sri Lanka we need to have institutional support even to go and find what is the knowledge that we have and we can use for new technology”*

Academia at KII

*“Sri Lanka should adopt its own system to protect traditional crops and farmers rights. The TRIPs agreement does not recognize community rights. This is a limitation. At the moment innovation is low in Sri Lanka, so the IP laws will protect only foreign applicants. We must strengthen the local innovation in this area first”.*

Researcher at KII

The importance of passing the new Act by the Parliament was also highlighted during discussions.

*“First we have got it implemented in practiced manner and then after that let it go for a few years or even more than that if there are anything that is missing from this act and then we can fill gaps”.*

Policy Maker – KII

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Intellectual Property Rights Overview, available at: <http://www.w3.org/IPR/>

World Trade Organization (WTO) available at: [www.wto.org/](http://www.wto.org/) - 23k

World Intellectual Property Organization (WIPO) available at; <http://www.wipo.int/about-ip/en/>

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**Appendix 1: Perception Survey Questionnaire**  
**Survey**  
**On**  
**“Intellectual Property Rights in Protecting New Plant Varieties and Farmers’**  
**Traditional Knowledge – The Case of Rice in Sri Lanka”**

**Background**

*It is mandatory for Sri Lanka to follow WTO’s Trade Related Intellectual Property Rights (TRIPs) agreement; however Sri Lanka is far behind in implementing and formulating Intellectual Property Rights (IPRs) on agricultural sector due to several reasons. The agreement states that member countries have to grant patent protection to micro-organisms and non biological and microbiological processes; and provide protection for plant varieties, either by patent, an effective sui generis system or a combination thereof. Countries which have strong IPRs are in a better position in international trade than countries which do not have well formulated IPRs system. This survey attempts to discover the perceptions of main stakeholders regarding the IPRs on Sri Lankan agricultural sector.*

You are kindly requested to make your free assessments of the available protection to plant varieties, plant genetic resources and farmers’ rights in Sri Lanka. Some of the aspects covered in the questionnaire are given below.

Please **TICK** or **HIGHLIGHT** the number that best represents the **strength of the rules and regulations (or the statement) available in Sri Lanka to protect plant varieties and farmers’ rights**. The lowest number represents Most Ineffective and the highest number represents the Most Effective. If you feel you do not have sufficient information about a particular question, you may choose to leave it blank.

Completing the Questionnaire should take less than 5 minutes of your time. Please email the completed questionnaire to [dilani@ips.lk](mailto:dilani@ips.lk) or [nadeesha@ips.lk](mailto:nadeesha@ips.lk) .

<b>Aspects</b>	<b>Description</b>
<b>Farmer’s rights</b>	Farmers' Rights consist of the customary rights of farmers to save, use, exchange and sell farm-saved seed and propagating material, their rights to be recognized, rewarded and supported for their contribution to the global pool of genetic resources as well as to the development of commercial varieties of plants, and to participate in decision making on issues related to crop genetic resources.
<b>Plant genetic resources</b>	Plant genetic diversity is probably more important for farming than any other environmental factor, simply because it is the factor that

	enables adaptation to changing environmental conditions. As farmers are custodians and developers of crop genetic resources, their rights in this regard are crucial for enabling them to maintain this vital role for local and global food security, and they are a central means in the fight against poverty.
<b>TRIPS agreement</b>	A WTO agreement, which came into effect on 1 January 1995, is to date the most comprehensive multilateral agreement on intellectual property rights.
<b>Other agreements relating to plant resources and farmers' rights</b>	Convention on Biological Diversity (CBD), Convention of the Union for the Protection of New Varieties of Plants (UPOV)
<b>The Plant Protection Act No. 35 of 1999</b>	It makes provisions against the introduction and spread of any organism harmful to or leading to destruction of plants and for the sanitation of plants in Sri Lanka.
<b>* Intellectual Property Act No: 36 of 2003</b>	This is in line with the WTO requirements. It has recognized that the plants, animals and other micro-organisms could not be patentable.
<b>* Sui- generis system</b>	Special protection system adapted to a particular subject matter, as opposed to protection provided by one of the main system of intellectual property protection, e.g., the patent or copy rights system
<b>* Benefit Sharing Scheme</b>	<b>It is a compensation scheme, designed to bring equitable sharing of compensation to countries of origin for genetic resources that are subsequently commercialized.</b>

1. What are the issues faced by Sri Lanka in protecting new plant genetic resources and rights of farmers?

- Lack of laws and policies or the deficiencies contained therein

Low High  
0-----1-----2-----3-----4-----5

- Improper enforcement of laws

Low High  
0-----1-----2-----3-----4-----5

- Lack of a proper institutional framework

Low High  
0-----1-----2-----3-----4-----5

- Lack of awareness and knowledge

Low High  
0-----1-----2-----3-----4-----5

- Malpractices at grass root levels

Low High  
0-----1-----2-----3-----4-----5

- Any other factors?

- .....
- .....
2. Does Intellectual Property Rights Act No: 36 of 2003 provide sufficient legal protection for plant varieties and farmer's rights?  
 Low High  
 0-----1-----2-----3-----4-----5
3. Does Act No: 36 of 2003 enhance the research and development activities in the plant breeding sector?  
 Low High  
 0-----1-----2-----3-----4-----5
4. How important are the available plant varieties in improving agricultural sector in a country?  
 Low High  
 0-----1-----2-----3-----4-----5
5. How important is farmers' traditional knowledge in improving plant varieties?  
 Low High  
 0-----1-----2-----3-----4-----5
6. Does Sri Lanka have sufficient technology to improve plant varieties and genetic resources?  
**Rice**  
 Low High  
 0-----1-----2-----3-----4-----5
7. Who are the main stakeholders in improving plant varieties?  
 • Farmers Low High  
 0-----1-----2-----3-----4-----5  
 • Department of Agriculture  
 Low High  
 0-----1-----2-----3-----4-----5
8. Will sufficient IPRs stimulate investments in agricultural sector?  
 Low High  
 0-----1-----2-----3-----4-----5
10. What is the most suitable method for Sri Lanka to protect plant varieties and farmers' traditional knowledge?  
 • Patents Low High  
 0-----1-----2-----3-----4-----5  
 • Sui generis system Low High  
 0-----1-----2-----3-----4-----5
12. Will Sri Lanka be better-off without implementing rules and regulations in-line with TRIPs agreement?  
 Low High  
 0-----1-----2-----3-----4-----5
13. Will Sri Lanka be better –off without Plant breeder's rights that would have enhanced the free exchange of genetic resources?  
 Low High  
 0-----1-----2-----3-----4-----5
14. Elaborate your answer for question number 13

.....  
.....  
.....

15. Does the draft plant breeder's law provide sufficient safety to the traditional crop varieties?

Low High  
0-----1-----2-----3-----4-----5

18. What is the main institution responsible for making rules and regulations to protect plant varieties and farmers rights in Sri Lanka?

- Department of agriculture  
Low High  
0-----1-----2-----3-----4-----5
- Ministry of Environment and Natural Resources  
Low High  
0-----1-----2-----3-----4-----5
- Intellectual property rights office  
Low High  
0-----1-----2-----3-----4-----5
- Ministry of legal affairs  
Low High  
0-----1-----2-----3-----4-----5
- Civil society  
Low High  
0-----1-----2-----3-----4-----5

19. Is it important for Sri Lanka (or any other agriculture based developing country) to have strong IPR system in agricultural sector to face competition in international trade?

Low High  
0-----1-----2-----3-----4-----5

20. What are your suggestions to protect plant varieties and farmers' traditional knowledge?.....  
.....  
.....

**Appendix 2: Guidelines of Key Informant Interviews**

**Research Study**  
**On**  
**“Intellectual Property Rights in Protecting New Plant Varieties and Farmers’**  
**Traditional Knowledge – The Case of Rice in Sri Lanka”**

**In-depth Interviews amongst Policy Makers**

**Respondent Information**

**Name :**

**Designation :**

**Date & Time. :**

1. What are the issues faced by Sri Lanka in protecting new plant varieties?
2. What are the issues faced by Sri Lanka in protecting farmers’ traditional knowledge?
3. How important are the available plant varieties in improving agricultural sector in Sri Lanka?
4. How important is farmers’ traditional knowledge in improving plant varieties? In Sri Lanka and internationally?
5. Does Sri Lanka have sufficient technology to improve plant varieties and genetic resources?
6. Who are the main stakeholders in improving plant varieties?

7. What are the existing laws in protecting new plant varieties, and farmers' traditional knowledge? As an example;
  - a. Act No. 36, 2003: IP Act.
  - b. Fauna and Flora Protection Ordinance as amended by Fauna and Flora Protection (Amendment) Act No. 49, 1993.
  - c. Plant Protection Act No. 35, 1999.
  - d. Seed Act No. 22, 2003.
8. International conventions/agreements ratified by Sri Lanka with regard to plant varieties and farmers' rights
  - a. TRIPs Agreement.
  - b. International Convention for the Protection of New Varieties of Plants.
  - c. International. Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)
  - d. United Nations Convention on Biological Diversity.
9. What are the available laws to protect seeds in Sri Lanka? with especial reference to rice seed?
10. Does Intellectual Property Rights Act No: 36 of 2003 provide sufficient legal protection for new plant varieties and farmer's rights?
11. Do we have sufficient laws to protect our own plant genetic resources?
12. How important is the draft Bill on Protection of New Plant Varieties and Breeder's Act?
13. What is the main institution responsible for making rules and regulations to protect plant varieties and farmers rights in Sri Lanka?
14. What are your suggestions to protect new plant varieties and farmers' traditional knowledge?

**Appendix 3: Farmer Focused Group Discussions**

දිස්ත්‍රික්කය		වයස	
ගම		ස්ත්‍රී/පුරුෂ බාවය	
ගොවිජන කේන්ද්‍රය		පවුලේ සාමාජික සංඛ්‍යාව	
නම		අධ්‍යාපන මට්ටම	

1. වගා කරන ඉඩමේ ජරමාණය.....
2. ඔබ වී ගොවිතැන හා සම්බන්ධ වී කොපමණ කලකද?.....
3. ඔබ වී ගොවිතැන සම්බන්ධ දැනුම ලබාගත්තේ කෙසේද?.....
4. ඔබ වගා කරන්නේ,
  - a. සම්ප්‍රදායික වී වර්ග
  - b. නව වී වර්ග
5. ඔබ නව වී වර්ග පිලිබඳව දැනගත්තේ කෙසේද?.....
6. සම්ප්‍රදායික වී වර්ග වලට වඩා නව ජරණේදවල ඇති වාසි මොනවාද?.....  
 .....  
 .....
7. ඔබට කන්නයකට අවශ්‍ය බිත්තර වී ජරමාණය කොපමණද?.....
8. ඔබ එම බීජ සපයා ගන්නේ කෙසේද?
  - a. තමන් විසින් පසුගිය කන්නවල අස්වැන්නෙන් සැකස ගැනීම
  - b. අසල්වැසි ගොවින් සමඟ හුවමාරු කරගැනීම
  - c. කෘෂිකර්ම දෙපාර්තමේන්තුවෙන් මිලදී ගැනීම

9. ඔබ ගොවිතැන් කටයුතු වලදී ඔබ සතු පාරම්පරික දැනුම භාවිතයට ගන්නේද?

ඔව්  නැත

10. ඔබට බිත්තර වී ලබා ගැනීමේ අපහසුතා තිබේද?

ඔව්  නැත

11. ඔබ සතු පාරම්පරික දැනුම ආරක්ෂා විය යුතු යයි ඔබ සිතන්නේද?

ඔව්  නැත

12. ගොවි මහතෙකු අලුත් වී ජරහේදයක් සොයාගතහොත් ඒ සඳහා අයිතිය ඔහුට ලබා දී ඒ වෙනුවෙන්

ඔව්  නැත

13. ඔබ ගොවිජන අයිතීන් පිළිබඳව දැනුවත්ද?

ඔව්  නැත

14. ඔබට හැඟෙන ආකාරයට ගොවිජන අයිතීන් මොනවද?

.....

15. මෙම අයිතීන් නීති මාර්ගයෙන් සුරැකිය යුතු යැයි ඔබ සිතන්නේද?

.....

16. ඒ සම්බන්ධයෙන් වගකිව යුතු ආයතන මොනවද?

- a. රජය
- b. පෞද්ගලික ආයතන
- c. රාජ්‍ය නොවන සංවිධාන
- d. වෙනත්.....

**Appendix 4: List of Participants for the Expert Consultation held on the 13<sup>th</sup> of September 2013 at the Institute of Policy Studies**

<b>Name</b>	<b>Institution</b>
Mrs G.R.Ranawaka	Intellectual Property Office
Dr W.L.D. Samarasinghe	Rice Research Development Institute
Dr P.A.Samarathunga	Institute of Policy Studies
Ms.Kanchana Abesekare	Industrial Technology Institute
Mr T.M.K.P.K. Hemarathna	Ministry of Agriculture
Mr P. Gurusinghe	Farmer Organization
Mr Manjula Wijesinghe	Agriculture Instructor- Ankumbura
Dr D.M.N.Dissanayake	Ministry of Agriculture
Dr Lalith Perera	Coconut Research Institute
Mr.Athula Liyanage	PGRC - Department of Agriculture
Dr Herath	Department of Agriculture
Ms N. Kamardeen	Faculty of Law
Mr W.K.Sugathadasa	Farmer Organization
Dr S.L Weerasena	Department of Agriculture -retired
Mrs. Renuka Jayathilaka	Industrial Technology Institute
Dr K Hettiarachchi	PGRC –Department of Agriculture
Dr.Kumudini Gunasekera	Coordinating Secretariat for Science, Technology and Innovation (COSTI)
Dr (Mrs) Padmini C. Girihagama	Sri Lanka Council for Agricultural Research Policy (CARP)
Dr Sumith Abeysiriwardhana	CIC Agri Business
Mr.T.G. Wijepala	Farmer Organization
Mr.Aruna Weerakkon	Private Sector
Dr. Radika Samarasekara	Industrial Technology Institute
Ms Diana De Alwis	University of Peradeniya

## **Section 4**

### **(iii) Relevance of results achieved to national / socio-economic development**

The main findings of the study highlighted the importance of implementing the newly draft act on protection of new plant varieties, establish a separate entity to monitor and advice farmers on intellectual property rights matters, grant honorariums for new inventors etc. These activities will benefit the development of nation directly and indirectly. The results of the study will support to motivate poor farmers to continue their inventions in developing more seed varieties. Further it will reduce farmers cost of purchasing of seeds from outside. Furthermore, it will provide due reorganization to farmers traditional knowledge.

In addition, with a strong protection system private sector will encourage to invest in agriculture research and development. Whereas at present private investments are at very lower level in the agriculture sector. Country's development depends on its investments and innovations. Outcomes of this study obviously inspire people to do more inventions. And also it will support to get more foreign investments.

Furthermore, a strong protection system will provide commercial value to new plant varieties where poor farmers can get benefit from those new plant varieties.

## **Section 5**

- (ii) List of major equipment acquired : NVivo-10 Statistical package
- (iii) List of publication/ presentations

### **Presentations**

- a. Hirimuthugodage, D. (2012), Presentation on "The TRIPs Agreement in Protecting New Plant Varieties and Farmers Traditional Knowledge in Sri Lanka" at the International on Symposium on Agriculture & Environment organized by the Faculty of Agriculture at the University of Ruhuna, on 29-11-2012.
- b. Hirimuthugodage, D. (2014), Presentation on "Intellectual Property Rights in Protecting New Plant Varieties: The Case of Seed Paddy in Sri Lanka", International Conference of Agricultural Sciences, University of Sabaragamuwa, 9-10th January 2014.
- c. Hirimuthugodage, D. (2014), Presentation on "The Trade Related Intellectual Property Rights (TRIPs) Agreement and the Agriculture in South Asia: A Sri Lankan

Perspective”, 12<sup>th</sup> Annual Conference of Asia Pacific Economic Association, Bangkok, Thailand 10-12 July 2014.

### **Publications**

- d. Hirimuthugodage, D. (2014), “Intellectual Property Rights in Protecting New Plant Varieties: The Case of Seed Paddy in Sri Lanka”, Abstracts, International Conference of Agricultural Sciences, University of Sabaragamuwa, Sri Lanka.
- e. Hirimuthugodage, D. (2012), Extended abstract on “The TRIPs Agreement in Protecting New Plant Varieties and Farmers Traditional Knowledge in Sri Lanka”, Proceedings of International on Symposium on Agriculture & Environment, Faculty of Agriculture, University of Ruhuna, Sri Lanka.

## **Section 6**


### **Summary Statement of Expenditure**

<b>Item</b>	<b>Expenditure</b>
Personal - Research Student	175,000.00
Consumables - NVivo 10	180,681.76
Travel & Subsistence	293,423.00
Miscellaneous	128,295.24
<b>Total</b>	<b>777,400.00</b>

**Section 7**

- i. Grantees' signatures

Name : Ms.Dilani Hirimuthugodage

Signature: 

Date: 03/08/2015

- ii. Comments of the Head of the Department/signature

(iii). Head of the Institution's signature

Name : Dr. Saman Kelegama

Signature: .....

Date : *03 Aug 2015.*.....

## TRIPs Agreement in Protecting New Plant Varieties and Farmers Traditional Knowledge in Sri Lanka

D Hirimuthugodage

Institute of Policy Studies, Sri Lanka

### Abstract

Trade Related Intellectual Property Rights (TRIPs) agreement was implemented by World Trade Organization (WTO) to regulate standards of Intellectual Property (IP) regulations in WTO member countries. Being a signatory to the TRIPs agreement, it was compulsory for Sri Lanka to formulate its IP regulations to comply with TRIPs agreement and to provide legal protection to new plant varieties and farmers' rights via patents or by an effective *sui generis* system or by both by 2006. Although Sri Lanka passed its Intellectual Property Rights Act to comply with TRIPs agreement in 2003, this act does not allow patenting of plants. Consequently, it does not provide protection for the agricultural sector. Due to the inability of providing necessary protection Sri Lankan agricultural sector had to face several difficulties in international trade and also it has lost a number of opportunities to use its own plant varieties for the benefit of future generation. According to the TRIPs agreement member countries are allowed to formulate their own IPR system according to their economy, farming and agricultural system. TRIPs agreement provides three options for member countries to protect new plant varieties. Hence, the main objective of this research is to identify the best possible protection method for Sri Lanka. The methodology of this research consisted with literature survey, face to face in-depth interviews amongst main stakeholders and a perception survey by using a questionnaire. The main finding of the research study was that the *sui generis* system is the most appropriate protection method for Sri Lanka considering its economy, agricultural patterns and farming system. Further, the study suggested several other techniques and methods to implement a strong IPRs system for Sri Lankan agricultural sector.

**Key words:** Intellectual property, Agriculture, TRIPs Agreement, Sui generis, protection

### Introduction

Sri Lanka is rich with a repository of natural resources including wild and agro biodiversity. Sri Lankan agro biodiversity has plant varieties with special traits which suits different uses and different agro climatic conditions. Farming practices and continuous selection of plant varieties by the Sri Lankan farmers over centuries have made a wide range of cultivated plants. Farming practices specialized his knowledge in several areas especially knowledge of science in soil, rotation and mixing of crops, methods of sowing, watering and reaping, saving seeds for future use etc. Hence, his knowledge of science in farming is also recognized as an important element in agriculture as his labour. This knowledge is a property of a farmer, simultaneously it's a property of a community

([www.farmersrights.org/resources/global\\_articles\\_16.htm](http://www.farmersrights.org/resources/global_articles_16.htm)  
l).accessed on 25/06/2012).

In most developing countries like Sri Lanka, agricultural development is primarily based on different crop varieties grown by farmers and the farmers traditional knowledge (Sahar 2000). With the global thrust for privatization, many developed countries, and the large businesses want to control natural resources and the knowledge associated with farmers for commercial purposes. They attempted to get private ownership over natural resources by obtaining patents. Biological resources have not been registered or documented in most of the developing countries like Sri Lanka. Thus, some Global Multinational Companies (MNCs) have engaged in piracy of vital genetic resources and associated traditional knowledge found in the developing countries to get patent rights for them in their countries. In this process, the developing countries continuously denied of the benefits which belong to them (Regine, 2007).

**Group 3:** countries that are yet to implement IPRs on agricultural sector according to TRIPs agreement and the problems they have faced due to the lack of protections and opportunities they have missed as a result of delaying the proper implementation of IPRs.

**Perception survey amongst stakeholders**

Perception survey consisted of a questionnaire which allowed the respondents to state their ideas and views on the identified research problem and it provided the opportunity for them to suggest solutions. It was carried out amongst key stakeholders consisting of; researchers, policy makers, academics, media, lawyers and government officials (Department of Agriculture, Department of Commerce, Department of Natural Resources, National Intellectual Property Rights Office etc.)

·Analysis of perception survey data by using Likert Score

·In-depth interviews amongst identified key stakeholders based on a semi structured questionnaire

·Findings of the above survey data analysis and literary search is compiled into the study in an attempt to identify the best protection method for Sri Lanka and strengthening IPR system for agriculture sector.

**Results and Discussions**

Perception survey questionnaire covered significant aspects of the TRIPs agreement and the Sri Lankan agriculture sector. The main purpose of the questionnaire was to get stakeholders views on IPRs and the Sri Lankan agricultural sector. Respondents had to rank their views on the questions given and they were provided numbers 1 to 5, based on Likert Score System.

The most important question in the questionnaire was to identify the best possible method for Sri Lanka to

**Table 2: Summary of Country Case Studies**

Country	Type of agricultural system	Seed production	Protection methods	Impact of the TRIPs agreement
USA	Highly Commercialized agriculture- family farming' and 'corporation farming'.	Most seeds were produced in private or communal farms.	Plant Variety protection Act 1970, Plant patent Act 1930 and Utility Patents under the general patent law of USA.	Intellectual property protection for plants goes back to 1906 i.e. before TRIPs
Australia	Highly industrialized -the large corporations dominate the market.	Nearly 70 percent of the R &D of new plant varieties are taken by public organizations.	Patents Act 1990 Plant Breeder's Rights Act 1994	Consistent with the international agreements-WTO's TRIPs agreement and the UPOV.
Thailand	3 types of farmer groups; crop farmers, fruit growers and orchid growers.	Plant breeding is undertaken by both public and private sector.	The Plant Protection Act 1999	Need of circulating the Plant Protection Act to comply with the TRIPs Agreement This Act was a direct outcome of India's commitment to the TRIPs agreement
India	Subsistence farming	Farming community (85%) and rest from public and private sector.	Protection of Plant Varieties and Farmers' Rights Act, 2001.	Prepared a draft to comply with TRIPs agreement
Nepal	Subsistence level farming	94 percent of the seed requirement from farmers and public and private sector.	Seed Act 1988 Seed regulation 1997.	

In recent past, Sri Lanka had to face many cases of bio-piracy and loss of patents of indigenous knowledge. For an example; the case of Kothalahibutu (*Salacia Reticulate*), clearly highlights the exploitation of wild varieties and the production of drugs based on traditional knowledge to which patent rights have been granted to Japan. The patent granted to the Japanese company prevents future generations of Sri Lanka from using and producing similar drugs (Gunsekera, 2007).

Being a member of the WTO, Sri Lankan intellectual property rights regime has to be in conformity with the TRIPs agreement. The main objective of this research study is to identify the best possible protection method for Sri Lankan agriculture, especially for new plant varieties and farmers traditional knowledge, and also to propose feasible techniques and methods to enhance the productivity of the sector by implementing a strong IPR system.

**Materials and methods**

Given the nature of the research questions being explored in the study, the methodology used will have both qualitative and quantitative components.

The methodology of this study consisted of; Desk research, content analysis, and literature reviews on the implications of TRIPs agreement on agricultural sector in selected countries.

**Analysis of case studies**

Identify different cases arisen in developed and developing countries when implementing and formulating IPRs on agricultural sector. A comparative analysis of selected countries have taken place at three levels which are as follows;

**Group 1:** countries that have implemented IPRs on agricultural sector successfully according to TRIPs agreement and the advantages or disadvantages they have experienced by complying with TRIPs.

**Group 2:** countries that have faced difficulties in implementing IPRs on agricultural sector according to TRIPs agreement analyse reasons for those difficulties and as to whether they are due to lack of legal system, political situation of the country etc.

Main areas discussed in the questionnaire	Main findings
What are the issues that faced by Sri Lanka in protecting plant varieties and intellectual property rights?	The identified main issue was lack of knowledge and awareness amongst the general public. Second issue was lack of institutions to prepare and monitor intellectual property rights. Third factor was the inadequacy of law enforcement. Malpractices at grass root levels recorded as the fourth factor. Lack of available laws and regulations is ranked as the final issue. All of these issues are inter-linked with each other.
What is the importance of IPR in Agriculture?	The respondents have stated (58% out of 100%) that the international trade accelerates with strong IPR and 42% of the total respondents have identified the importance of IPR in stimulating investments.
What is the importance of IPR system for Sri Lanka? (This question was asked according to participants)	Policy makers have identified the importance of IPRs in agricultural development of a country and they have provided an average of 4.6. Government officers have indicated the second highest value for the importance of the IPR. Civil societies have ranked it as 4. Lawyers who are involved in the field of IPR have marked it as 4. Academia category has indicated 3.45.
Which institutions responsible for making IPR rules?	Department of Agriculture, Intellectual Property Office, Ministry of Environment, Civil society and Ministry of Legal Affairs are responsible in making IPR rules for the agricultural sector.
Does the present Intellectual Property Act (2003 IPR Act) in Sri Lanka provide sufficient protection for new plant varieties and farmers? (This question was asked according to participants)	It doesn't cover the IPR aspects in agriculture and also it doesn't provide sufficient protection for new plant varieties. Further, the support given by this Act for research and development in the agricultural sector is very minimal. In present context, it provides protection for new plant varieties only.
What are the factors that need for the development of the agricultural sector?	Respondents have ranked farmers' knowledge as the first. The available plant varieties and available technology recorded as the second and the third factors in the development processes.

protect plant varieties and farmers' traditional knowledge. Selected stakeholders have suggested Sui generis system as the most appropriate method for Sri Lanka. Nearly 69 percent of the stakeholders have ranked Sui generis as the best possible protection method for Sri Lanka considering its agricultural, farming and economic system.

USA and Australia are developed countries and have been protecting plant varieties under plant variety protection legislations for many years. Thailand and India are developing countries and consist with subsistence agricultural system which is similar to Sri Lanka. Moreover, plant variety protection legislations become important in these two countries with the ratification of the TRIPs agreement. Nepal is a less developed country and currently facing on serious issues of loss of bio diversity due to improper protection system.

According to the country case analysis developed countries like USA and Australia provide protection for plant varieties by both plant breeder's rights and patents. The main reason for choosing patents for protection is due to their technological capabilities and immense financial benefits that a patent system is expected to generate. However, developing countries have adopted plant breeder's rights considering the

difficulties in providing protection to through patents. In the face of growing scarcity of land and water and emerging challenges from climate change, productivity gain in agriculture will be the remaining option available to increase agricultural output for economic growth in Sri Lanka. Productivity improvement should be achieved by way of introducing high-yield seeds, new technology through sustained investment in agricultural research and development. A well-established IPR system will help to encourage innovations, technology transfers, investments and international trade flows.

In light of the above facts, it is clear that the Sui generis will be the most appropriate protection method for Sri Lanka considering its farming, agricultural and economic system. Furthermore, providing a well-established IPR system will drive the growth in the agricultural sector.

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INTELLECTUAL PROPERTY RIGHTS IN PROTECTING NEW PLANT VARIETIES:  
THE CASE OF SEED PADDY IN SRI LANKA

D. Hirimuthugodage\*

*Institute of Policy Studies of Sri Lanka, 100/20, Independence Avenue, Colombo -07, Sri Lanka*

In the face of growing scarcity of land in Sri Lanka, water and emerging challenges of climate change, productivity gain in agriculture will be the option available to increase agricultural output in the country. Productivity improvement should be achieved by introducing new technology generated through sustained investments. A well-established Intellectual Property Rights (IPRs) system will help to encourage innovations, technology transfers and product development. Being a signatory to the Trade Related Intellectual Property Rights (TRIPs) agreement, it was compulsory for Sri Lanka to formulate its intellectual property regulations to comply with TRIPs agreement and to provide legal protection to new plant varieties via patents or by an effective *sui generis* system or by both by 2006. Although Sri Lanka passed its Intellectual Property Rights Act in 2003 to comply with TRIPs agreement, it does not allow patenting of plants. Due to the inability of securing necessary protection, Sri Lankan agricultural sector had to face several difficulties in international trade and also it has lost a number of opportunities to use its own plant varieties for the benefit of future generation. Further, several cases of bio-piracy and loss of patentability of new plant varieties were encountered due to lack of effective IPRs system. Presently, Sri Lanka produces almost all its seed paddy requirement. Majority of farmers (90%) uses seed paddy produced by themselves from their previous crops or else they borrow from neighboring farmers. Thus, it is imperative to protect their inventions and knowledge in a systematic manner. The main objective of this study is to identify the best possible protection method for new plant varieties in Sri Lanka with a special reference to seed paddy. The methodology consisted with literature survey, key informant interviews, perception survey using a semi-structured questionnaire, focus group discussions with farmers and an expert consultation workshop. The main finding was that the *sui generis* system is the most appropriate protection method for Sri Lanka considering its economy, agricultural patterns and farming systems and also considering the existing IPR laws in Sri Lanka. Further, the study suggested several other techniques and methods such as a need of separate institute to monitor and documentation of existing knowledge of farmers to implement a strong IPRs system for Sri Lankan agricultural sector.

**Keywords:** *intellectual property, new plant varieties, seed paddy, TRIPs agreement, sui generis*

\*Corresponding author: dilani@ips.lk.



**INSTITUTE OF POLICY STUDIES OF SRI LANKA**

100/20, Independence Avenue, Colombo 7, Sri Lanka

Tel: +94 11 2143100 Fax: 94 11 2665065

Email: [ips@ips.lk](mailto:ips@ips.lk); Website: [www.ips.lk](http://www.ips.lk)

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