



Establishment of Plant Breeders' Rights System In Tanzania: Achievements and Challenges

A Case Study

*Under the Ministry of Agriculture Food Security and Cooperatives,
Tanzania -CAS-IP NPI Collaboration Project*

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Acronyms

ASARECA	Association for Strengthening Agricultural Research in Eastern and Central Africa
AU	African Union
AVRDC	Asian Vegetable Research and Development Centre
CAS-IP	Central Advisory Services on Intellectual Property
CBD	Convention on Biological Diversity
DUS	Distinctness, Uniformity and Stability
FAO	Food and Agriculture Organization
IPRs	Intellectual Property Rights
ISF	International Seed Federation
IT-PGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
MAFC	Ministry of Agriculture Food Security and Cooperatives
NPI	National Partners Initiative
OAU	Organization of African Unity
PBR	Plant Breeders' Rights/ Plant Breeder's Right
PBRA	Plant Breeders' Rights Act
PBRO	Plant Breeders' Rights Office
PVP	Plant Variety Protection
QDS	Quality Declared Seed
TRIPS	Trade-Related Intellectual Property Rights
UPOV	International Union for the Protection of New Varieties of Plants
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

1. Background and Justification for the Study

The Government of Tanzania has established a legal system for protection of plant breeders' rights in order to put in place a mechanism for rewarding plant breeders and for the purpose of promoting plant breeding activities to stimulate and promote agricultural development. The system was put in place through enactment of the Plant Breeders' Rights Act in 2002 which officially became operational in 2004 and based on the experiences and the outcome of implementing the system, there has been calls from stakeholders for the government to review the law governing the granting of plant breeders' rights to make it more compliant to international systems of variety protection for the purpose of increasing local and foreign investment in plant breeding. In agreement with CAS-IP of Bioversity International, the Ministry of Agriculture Food Security and Cooperatives of Tanzania carried out a case study in 2008 in order to appraise the system and document experiences gained, lessons learnt and challenges in the process of establishing and managing the Plant Breeders' Rights Office in the country and make recommendations for improvement. The recommendations will also serve as advice to other NPI member countries that are practicing or are in the process of putting in place similar system of plant variety protection.

This study seeks to review appropriateness of the current plant breeders' rights system in Tanzania and its contribution to an effective *sui generis* ("of its own kind") system, and attempts to formulate an appropriate model in line with the TRIPS Agreement. The study prepares a benchmark review of activities undertaken in Tanzania thus far towards the creation and operationalization of a *sui generis* system (covering developments in legislation, institutions, as well as studies and analysis carried out by the government, private sector and other stakeholders). The study will also assess Tanzania's compliance with the Agreement on Trade-Related Intellectual Property and other international legal frameworks for the protection of plant variety. The findings will facilitate an identification of the areas (legislative, analytical and institutional) where follow up for reform is required. The study will also examine how farmer s' rights are handled.

2. Materials and Methods

The study has reviewed and documented the whole process from what necessitated a decision on establishment of a plant variety protection system to development and implementation of the law, activities involved in the process of establishing the office and operationalization of the office including availability of necessary resources.

In order to achieve the objectives of the case study, all existing literatures and documents on the establishment and operationalization of the plant breeders' rights system in Tanzania were collected and reviewed. Opinions from major stakeholders of the system who included officials of the Ministry of Agriculture Food Security and Cooperatives and Plant Breeders' Rights Office, plant breeders in the field, seed producers, academicians and farmers/farmer groups were collected through individual interviews or through discussions in workshops and meetings. During the process the stakeholders' views regarding the efficiency of the system and suggestions for improvement were sought. The stakeholders meetings were also used to establish the level of their awareness on the importance and benefits of the plant variety protection system so that means of raising their awareness could be recommended.

3 The Concept and Importance of Intellectual Property Rights (IPRs)

Intellectual property can be defined as that which is created by the human intellect ("ideas" or "thoughts"), often intangible unlike other forms of property. When the ideas or thoughts are converted to practice (for example, in appliances, drugs, books, new plant varieties etc), and the reduced-to-practice ideas are new (novel), they can be protected by government laws. These laws confer to the creator exclusive legal rights over the subject

matter, which serve as a reward for their achievement and contribution to socio-economic progress as well as an incentive for further innovation.

Types of intellectual property rights include:

- Industrial property: (**patents**, trade marks, special rights for integrated circuits, utility models, industrial designs, *etc*); and
- Literary and artistic property: (copyright, rights of performers, *et. cetera*).
- **Plant variety protection (PBR): a *sui generis* system often excluded from lists of intellectual property categories**

3.1 The Importance of IPRs to the Agricultural Sector

In Tanzania, over 80 per cent of the population lives in rural areas and depends on agriculture for their livelihood. This sector contributes about 26.5 percent to the GDP and comprises 54 percent of the nation's foreign exchange earnings¹. Agricultural development is therefore crucial to both national economic development and poverty reduction, but specifically, it stimulates local rural economies and may curb rural to urban migration. Strong Intellectual Property Rights' (IPRs) play a significant role in attracting investment in agriculture, and enhance market growth, access and diversification as they provide incentive to breeders by assuring them that their expenditure and development will be protected. Adequate plant variety protection encourages investment in the plant breeding sector and opens a country's door to overseas varieties where the protection of law is guaranteed. More often than not, new plant varieties render higher yield and quality product, as well as a greater resistance to disease rendering them a crucial aspect of production. Through these varieties the benefits of plant variety protection therefore extend to farmers, producers and to the national economy.

It is envisaged that Trade Marks, Patents and Plant Variety Protection will have some impact on the pace and direction of growth of the sector. Simply put, trademarks have an important role to play in the identification of agro-products, such as seeds, of a particular enterprise. They can also convey to customers an indication of the quality of the product. Patents and plant variety protection systems are likely to have greater influence on access to technology issues, such as seed of improved varieties. These latter two forms of protection share some commonalities:

- They create incentives for investment in the research and development of new plant varieties. Holders have the opportunity to exploit their inventions and therefore recoup their investment costs free from the competition of those who have not made such investments and who would, in the absence of patent or plant variety protection, benefit unfairly;
- The rights are territorially limited and therefore apply only within the state, or the group of states, in which they are granted; and
- They represent a balance between the public interest and the private interest of the holder.

Despite these similarities between patents and plant variety protection laws, there are some principle differences between them. These are summarized in Table 1 below.

¹ MAFC Budget Speech made to the National Parliament in July 2008

Table 1. A General Comparison of Patent And Plant Variety Protection Law

Subject	Patent Protection	Plant Variety Protection
Holder of Protection	Inventor	Plant Breeder
Ease of making application	Requires involvement of patent specialists/lawyers	User friendly; breeder can make the application.
Object of protection	(Industrial) invention	Plant Variety
Documentary examination	Required	Required
Field examination	Not required	Required
Plant material for testing	Not required	Required
Conditions for grant of rights	a) Novelty b) Industrial applicability c) Non-obviousness (inventive step) d) Enabling disclosure	a) Novelty b) Distinctness c) Uniformity d) Stability e) Appropriate denomination
Determination of scope of protection	Determined by the claims of the patent	Fixed by the national legislation (by UPOV Convention in the case of UPOV member States)
Use of a protected variety for breeding further varieties	May require the authorization of the patentee.	Does not require authorization of the right holder.
Term of protection	20 years from date of application (as per TRIPS Agreement)	25 yrs for trees and vines, 20 yrs for other plants, from date of grant (1991 Convention)

Source: Wachira F. & Ngwediagi. A review of PVP Laws in Eastern African countries of Kenya, Uganda, Tanzania and Rwanda, submitted to ASARECA in 2006

Patents are granted for inventions (there must be evidence of an inventive step); the patenting of plants has always carried misconceptions and ambiguities. In Tanzania Patent Act, 1987 does not allow the patenting of life forms (section 7)². The same prohibition exists under the European Patent Convention. Therefore, plant breeders in Tanzania can only protect their new plant varieties through the plant variety protection legislation.

4. Plant Breeders' Rights, Farmers Rights and Community Rights

4.1 Plant Breeders Rights

Plant Breeders' Rights (PBRs) are defined by UPOV³ as an exclusive right over the commercial production and marketing of the reproductive or vegetative propagating material of the protected variety. The creation of this category of rights as an alternative to patents was intended to provide incentives for the seed industry. Therefore the primary motivation behind such rights is profit-making; these rights attract investment from the private sector and stimulate research and development of stronger and more productive plant varieties.

The development of a new variety is usually a long and costly undertaking and therefore by allowing breeders to control commercialization of their variety, by enacting and implementing a plant breeders' rights legislation gives them a chance to recoup costs and profit from their breeding investment. This also motivates breeders to continue developing new varieties for the benefit of farmers and the society in general.

4.2 Farmers' Rights

² Tanzania Patent Act of 1987

³ UPOV Convention of 1991

In developing countries, seed supply requirements are met through exchanges between farmers, which operate alongside other more formal mechanisms. Farmers' seed systems are largely based on traditional methods of selection between varieties as well as seed multiplication carried out on farms, but still involve modern varieties. Nevertheless there is no uniform interpretation of farmers' rights in relation to IPRs on plant varieties. Farmers' rights protection carries with it benefits such as the improvement of the livelihood of those farmers and their communities; environment conservation and the monitoring of resources; the prevention of rural migration; less dependence on foreign countries and the prevention of biopiracy by recognizing the contribution of local farmers.

The major difference between farmers' rights and IPRs is that while the latter offers exclusive rights, the former is geared towards compensation and benefit sharing. Also, farmers' rights do not readily define the title holder or subject matter, while they are clearly established for IPRs. Finally, IPRs are also of a limited duration while farmers' rights are unlimited

Farmer's rights are a counter-balance to PBRs in recognition of the farmer's contribution to agricultural innovations, to promote the equitable sharing of genetic resources and in recognition of the importance of the conservation of such resources and traditional practices. The legal scope of these rights is still in debate. A whole spectrum of views has been put forward regarding the utility and place of farmers' rights protection in the law. Some of these views include: There should be no relationship between farmers' rights and IPRs; Farmers rights should be recognized in laws relating to plant breeders' rights; A *sui generis* regime on farmers' rights should be established separately from existing forms of IPRs and The existing definitions under plant breeders' rights legislation should be extended to protect farmers varieties.

Part V of the Model Law developed by the African Union outlines farmers' rights which include the right to save, use, and exchange seed produced on farms, and to use protected varieties in the development of new farmer's varieties.

The importance of having a clear understanding of what should be regarded as farmers' rights and their place in legal systems is less pronounced in developed countries but is relevant in the developing country context. Here, farmers are a primary source of seed supply through informal exchange arrangements. For example in Tanzania, 95 percent of seed management is carried out by farmers and the remaining 10 percent supplied by certified seeds sold on the market (these are generally much more expensive and are not easily available to many farmers in remote areas)⁴. The Plant Breeders Rights Act of 2002 recognizes this situation and therefore provides that farmers are privileged to save seeds of a protected variety as long as it is grown in their own holdings (farms). The Act also does not discriminate farmers in the definition of a breeder, meaning that a farmer can also develop and protect a new variety. However, the Act does not provide other forms of rights specifically for farmers but the government has initiated a process of enacting a law on access and use of plant genetic resources where all matters related to farmers rights will be captured.

In order to solve the problem of seed availability and affordability to small scale farmers, the Tanzanian government has initiated an on-farm seed production system known as Quality Declared Seed (QDS) System⁵. The QDS system allows small scale farmers (growing not more than 5 acres of seed) to produce seed on their own farms and declared the quality of their own seed and sell to nearby farmers within an administrative area known as a ward. The national seed certification agency may once in a while inspect these farmers but their involvement does not exceed 10 percent. The system has been operational since the year 2000 and has now been legalized by the new Seed Act of 2003⁶.

4.3 Community Rights

The sovereign rights of the state over its natural resources forms the basis of its negotiating position on the international plane and the right to develop policies appropriate for its national context. Community rights are those belonging to members of an identifiable

⁴ MAFC Report to the National Variety Release Committee, December 2008

⁵ QDS Programme Launch Report, 2002

⁶Tanzania Seed Act of 2003

indigenous community, with each member entitled to use of the common property and any management issue pertaining to the property must have the consent of the entire community. A delineation of these rights is often difficult given that property rights are individualistic in nature, but this should not negate recognition of community rights which recognize their conservation role, to provide incentives and also to fulfill their human rights entitlements. Currently there is no specific law for the protection of community rights in Tanzania, and based on the current administrative structure in the country such law may be difficult to implement. As a way of strengthening national unity and cohesion, immediately after independence, Tanzania abolished village chiefdoms which existed along tribal boundaries and established new village boundaries and leadership that had little to do with tribal affiliations. It might therefore be difficult to distribute any benefits arising from the use of plant genetic resources which were obtained from areas originally belonging to a certain indigenous community.

5. International Obligations for Tanzania

5.1 OAU Model Law

A Model Law which outlines its *sui generis* system has been developed by the AU, formally, OAU. The law deals with access to biological resources, benefit sharing and the rights of farmers and breeders over their knowledge and resources. It rejects the exclusive appropriation of any life form, including derivatives. Communities can prohibit access to resources only where it would be detrimental to their natural heritage; also, at least half of the benefits derived from access must be directed back to the community. This framework provides a comprehensive definition of farmers' rights, including protection of their traditional knowledge relevant to plant and animal genetic resources, the right of equitable share of benefits arising from the use of plant and animal genetic resources, the right to participate in making decisions on matters related to the conservation, exchange, and sale of farm-saved seed or propagating material, and the right to use a commercial breeder's variety to develop other varieties. It also provides that where food security or nutritional or health needs are adversely affected, governments are allowed, in the public interest, to restrict the realization of the rights of breeders. Breeders' rights are modeled after the UPOV Conventions, although article 43 of the Model Law provides broad exemptions to breeders' rights including non-commercial use rights, sale of the plant material for food or sale within the specific geographical location where the plant material originated, and also use as an initial source for propagating another variety⁷.

Although the Organization unanimously approved the Model Law, very few members have enacted their PBR laws using the model law. This has brought the discussions on the need to revise the model law to meet the present needs of its member states.

5.2 TRIPS Agreement

The World Trade Organization's Trade-Related Intellectual Property Agreement⁸ obliges its signatories to provide for such intellectual property protection in their laws, and sets out the minimum standards that must be contained therein. Plant variety protection is often excluded from lists of intellectual property categories. However, the adoption of the TRIPS Agreement has done more to encourage the legal protection of plant varieties than any other international agreement. As the Plant Variety Protection (PVP) debate has continued, a school of thought has evolved that considers it a form of industrial property right.

The TRIPS Agreement does not require that a specific system be put into place to secure intellectual property rights for plant varieties. The Agreement mandates its signatories to provide patent protection for any invention in all fields of technology, provided that the inventions are "new, involve an inventive step and are capable of industrial application". Such protection for plant varieties is covered by Article 27.3 (b) of the Agreement which partly states the protection is to be provided "...either by patents, or by an effective *sui generis* system or by any combination thereof". This means that the range of options is unlimited, provided some requirements are met. This also means that WTO member states, including

⁷ http://www.grain.org/brl_files/oau-model-law-en.pdf

⁸ http://www.wto.org/english/tratop_e/TRIPS_e/trips_e.htm

Tanzania are allowed to develop legislation that takes into account its unique features. Furthermore Article 27.3 (b) of the Agreement states that members may exclude from patentability “plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological processes. Thus, as presently written, the TRIPS Agreement would permit WTO members to decline to protect plant varieties using the patent method provided they protect such varieties with an effective *sui generis* plant variety protection system. There is no guidance or agreed formulation as to what constitutes ‘effective’, nor what a *sui generis* system should entail at minimum. The International Seed Federation (ISF) recommends that countries envisaging the development of such *sui generis* systems ensure that as a minimum they conform to the requirements of the 1991 Act of the UPOV Convention,

Least Developing Countries (LDCs) such as Tanzania were given an extension until 1 July 2013 to set up the appropriate protection framework under the TRIPS Agreement.

The TRIPS Agreement provides for a review of Article 27.3(b), which began in 1999. Among the topics discussed in the TRIPS Council are:

- How to apply the existing TRIPS provisions on whether or not to patent plants and animals, and whether they need to be modified.
- The meaning of effective protection for new plant varieties
- How to handle moral and ethical issues, for example, to what extent invented life forms should be eligible for protection.
- How to deal with the commercial use of traditional knowledge and genetic material by those other than the communities or countries where these originate, especially when these are the subject of patent applications.
- How to ensure that the TRIPS Agreement and the UN Convention on Biological Diversity (CBD) support each other.

Most recently discussed are proposals on disclosing the source of biological material and associated traditional knowledge. The African group at WIPO has made a specific proposal on disclosure in patent applications of information on the origin of genetic resources and traditional knowledge on which invention is based.

5.3 Convention on Biological Diversity (CBD)

The CBD⁹ is the most recent and comprehensive instrument that balances the need for legal protection of intellectual property rights with that of the specific context of developing countries sustainable development agendas. The CBD preamble and its Article 8 recognize both the dependence of local communities on biological resources and the role that they have played in the evolution, conservation, and sustainability of such resources. The Convention calls for the equitable sharing of benefits arising from the use of their traditional knowledge, innovations and practices, relevant to the conservation of biodiversity and the sustainable use of its components. The CBD is not limited to plants but to all biological resources. The directives contained in the Convention have been included as an important element of the current TRIPS negotiations. Tanzania became a member of the CBD on 8th March 1996 and is therefore bound and affected by its impact on trade negotiations and potential future WTO amendments. The Convention offers an important setting for information sharing but also resources for technical assistance that Tanzania has been in the process of exploration since it became a member. Tanzania is also a member of the Cartagena protocol on Biosafety since September 2003.

5.4 International Treaty on Plant Genetic Resources for Food and Agriculture (IT-PGRFA)

The International Undertaking on Plant Genetic Resources for Food and Agriculture¹⁰ is a non-binding instrument which furthers the tenet that plant genetic resources are the common heritage of mankind. The treaty protects the material in gene banks and in farmers’ fields from being directly patented and encourages countries to protect farmer’s rights. Negotiations for a revision of some of the articles pertaining to farmer’s rights have caused some controversy as the draft provisions emphasize acknowledgment of the role of farmer’s

⁹ <http://www.cbd.int/convention/>

¹⁰ <http://www.planttreaty.org/>

to agricultural management rather than their rights. The treaty focuses on aspects such as the protection of traditional knowledge and the equitable sharing of benefits arising from the exploitation of biological resources, proposing a multilateral system that facilitates access to genetic resources and sharing of benefits without any monopolies. The Treaty steers countries towards the recognition of the need to give farmers control over their knowledge for reasons of justice as well as to foster sustainable use and conservation of plant genetic resources. Nonetheless, it leaves member states free to decide on the most appropriate framework for them.

Under Article 27, the Treaty is open for accession by all Members of FAO and any States that are not Members of FAO but are Members of the United Nations, or any of its specialized agencies or of the International Atomic Energy Agency. The Treaty entered into force the 29 June 2004. Tanzania is a member of the treaty of which it acceded on 30th April, 2004 and has now initiated a process of enacting a law to domesticate it.

5.5 The UPOV Model and its Membership

The International Union for the Protection of New Varieties of Plants¹¹, known as "UPOV," is an intergovernmental organization with headquarters in Geneva. The acronym UPOV is derived from the French name of the organization, *Union Internationale pour la Protection des Obtentions Végétales*.

The mission of UPOV is to provide and promote an effective system of plant variety protection, with the aim of encouraging the development of new varieties of plants, for the benefit of the society.

The purpose of the UPOV Convention is to ensure that the members of the Union acknowledge the achievements of breeders of new varieties of plants, by granting to them an intellectual property right, on the basis of a set of clearly defined principles. To be eligible for protection, varieties have to be (i) distinct from existing, commonly known varieties, (ii) sufficiently uniform, (iii) stable and (iv) new in the sense that they must not have been commercialized prior to certain dates established by reference to the date of the application for protection.

The UPOV Convention sets out a minimum scope of protection and offers members the possibility of taking national or regional circumstances into account in their legislation. Like all intellectual property rights, plant breeders' rights are granted for a limited period of time, which is twenty five years for trees and vine and twenty years for other plants respectively, at the end of which varieties protected by them pass into the public domain. The rights are also subject to controls, in the public interest, against any possible abuse.

Under the 1991 UPOV Convention, a breeder is defined as the person who breeds, or discovers and develops, a variety. Therefore, protection is not limited to a breeder in the sense of someone who produces a variety as a result of crossing parent plants and selecting from the progeny. The term breeder also includes a person who discovers a mutation or a chance seedling and then by a process of selective propagation (development) converts that discovery into a cultivated variety. Discovery by itself is therefore not sufficient and the breeder must also have had an input of development.

Many countries that have joined UPOV have reported increases in plant breeding activities with direct effects upon their agricultural and horticultural industries. They have reported increases in the range of varieties made available to farmers and growers as well as increased investments in agriculture. In Argentina for example, the number of PVP grants to foreign breeders, increased following the amendment of the national PVP law to comply with UPOV. The number of granted titles more than trebled in 10 years since the country became a UPOV member, that is, from 17 to 62 (355 percent). The increase in number of foreign titles was more evident in important agricultural crops (such as soybean, roses, strawberry and Lucerne), for which improved varieties are important for competitiveness in the global market. In China, farmers have greatly benefited from the introduction of a PVP system and in

¹¹ http://www.upov.int/index_en.html

particular with UPOV membership. They have seen the development of a number of new varieties of the most important agricultural crops such as maize, rice, wheat, soybean and oilseed rape. The number of PVP grants in China increased from 39 to 261, one year after joining UPOV. These examples demonstrate that with suitable PVP laws, returns from breeding activities can be potentially reinvested in crop improvement activities. This could contribute to the development and release of many more new varieties, particularly in Africa where most of the breeding activities are inadequately funded from public coffers. The UPOV plant variety protection system provides breeders with an incentive to properly maintain their varieties and ensure that authentic propagating material is available to users (including others breeders) to breed further varieties, thus serving as a genetic resource.

Currently UPOV has 66 members and more than 18 applications for membership are being processed. In Africa there are four members (South Africa, Kenya, Morocco and Tunisia). Zimbabwe application is under consideration as well as collective application of 16 West African states under OAPI.

6. Establishment of and Operationalization of Plant Breeders' Rights System

6.1 Need for a Plant Breeders' Rights system

The seed industry in Tanzania needs the active participation of private sector. The role of the private sector in agricultural development has been recognized in several government documents such as the Poverty Reduction Strategy (RSP)¹², the Vision 2025¹³, and in particular, the Agricultural Development Policy of 1997¹⁴ and the Agricultural Sector Development Strategy (ASDS) of 2001¹⁵.

A well-functioning seed industry requires a suitable legal and institutional framework that could serve as a catalyst to seed trade under a free market economy,

The objective or main purpose of the Tanzanian Plant Breeders' Rights Act, as provided in its long title, is "to provide for the protection of new plant varieties in order to promote plant breeding activities that will stimulate, facilitate and improve agricultural research in the country, through the grant and regulations of plant breeder's rights and the establishment of a plant breeder's rights registry, which is entrusted with the obligations of granting plant breeders rights".

The government decided to put in place a plant variety protection framework after conducting a study to establish whether or not it was necessary. The study was conducted in 1995/96 with technical assistance from the United Nations' Food and Agriculture Organization (FAO). The study¹⁶ produced a number of recommendations after the FAO consultants had met and discussed with all stakeholders including government officials from relevant ministries, public and university plant breeders, seed companies and other stakeholders that it was right time for the country to introduce a legal framework to regulate granting of plant breeders' rights. The study also recommended that the legal framework should establishment an independent PBR Office that will be based at the ministry responsible for agriculture. Most stakeholders had supported the idea of establishment of a plant variety protection system in Tanzania because they believed that it would contribute to increase in number of improved varieties as well as investment in agriculture sector in general.

Following the revelation of the findings of the study, the government took sufficient time to discuss and finally accepted the recommendations and started the process of establishing the legal system for the protection of plant breeders' rights. The process involved holding discussions with stakeholders on the formulation of a draft law before a bill was submitted to the National Assembly (Parliament) for final decision. The government and

¹² Tanzania Poverty Reduction Strategy of 2001

¹³ Tanzania Development Vision 2025 of 2000

¹⁴ Agricultural Development Policy of 1997

¹⁵ Agricultural Sector Development Strategy (ASDS) of 2001

¹⁶ FAO 1996. Study on the need for a plant variety protection system in Tanzania

stakeholders had expected that the system would confer the following advantages to Tanzania:

- To assist in providing sustainable compensation for long years of involvement in developing and testing new varieties;
- To provide an incentive to local (public and private) and international breeders to involve themselves fully in plant breeding in the country, therefore providing farmers with high quality varieties;
- To provide incentives for increased investments in seed production, horticulture and agriculture in general;
- To facilitate technology generation and transfer through shared breeding and licensing;

It is important to note that before and after the Bill was submitted to the Parliament, no stakeholder including the non-governmental organizations had objected to the idea of introducing the plant variety protection system. To some extent this may have been attributed to the lack of sufficient knowledge on the impact of the system and lack of a proven example of any negative impact in African countries practicing the system.

6.2 PBR Legislation

6.2.1 PBR Act

The Protection of New Plant Varieties (Plant Breeders' Rights) Act No. 22 of 2002¹⁷ is an Act to provide for the establishment of a registry of plant breeders' rights; promotion of plant breeding and facilitation of agricultural advancements through the grant and regulation of plant breeders' rights and for matters connected herewith. The Act was passed in the National Assembly on 7th November 2002 and the Minister responsible for agriculture declared 1st February 2004 as the official operational date of the Act.

The Plant Breeders' Rights Act of 2002 is a *sui generis* piece of legislation that provides for a voluntary system intended to enhance plant breeding activity in the public and private sectors. The Act adopts, to a large extent, major provisions of the UPOV Convention of 1991 although some differences are notable. As provided under UPOV Act, Section 14 of the Tanzanian PBRA requires that some specific conditions be met before a variety can be protected. Such variety must be:

- New;
- Distinct (clearly distinguishable from any other variety of common knowledge at the time of the application) ;
- Uniform; and
- Stable (unchanged after repeated propagation).

The novelty condition (newness) is given in relation to commercialization of a particular variety in which the Act authorizes an allowance period for sale before application, that is, one year in the country of application, or, in any other country, six years for trees or vines, or four years for other plants.

The applicant must also meet some administrative requirements such as filling in application forms and payment of prescribed fees. In addition the variety must have a suitable name (denomination) which must be used in the market place to avoid confusion and misidentification of varieties. The law does not allow for inclusion of any additional conditions for granting of PBR rights.

The Plant Breeders' Rights Act provides that the breeder of a protected variety shall have sole rights to:

- Sell
- Reproduce or multiply the propagating materials,
- Process
- Stock the variety
- Export and
- Collect royalties through licensing and assignment of his or her rights

¹⁷ <http://www.agriculture.go.tz/Regulations.htm>

The PBR Act of 2002 gives exemption to the breeder's right. As provided under UPOV 1991 Act, the PBR Act provides that the breeders' rights do not cover private and non-commercial acts, experimental acts or those carried out for the purpose of breeding other varieties. Section 34 of the privileges farmers to save seeds of a protected variety harvested in their own holdings but unlike provisions of UPOV Convention of 1991, it does not require the authorities to put limit for farmers to as to how much should be saved on their own holdings.

Under Section 35 of the statute, protection lasts 25 years for trees and vines, and 20 years for other crops. The rights holder can request to the Registrar for an extension upon expiry of the coverage period. The Act also details the procedures for objections to a grant of PBRs following publication of the notice for the filed application in the Official Gazette. In addition to fees paid at the application, the right holder is required pay a prescribed fees in order to maintain the right. The act allows applicants to appeal any decision of the Registrar before the Appeals Board

The PBR Act does not clearly deal with the farmers and community rights save for section 57, which states simply that the Minister shall ensure that implementation of this Act shall not affect the fulfillment of government obligations pertaining to protection of farmers' rights. The Act also establishes a Community Fund whereby part of the revenue paid to the Registry of Plant Breeders' Rights is set aside for development activities of the arrears that contributed to the development of the protected varieties. The PBR Act privileges farmers to save seeds of a protected variety as long as it is used in their own holdings. The law protects public interests through provisions regulating compulsory licensing of a protected variety in case a right holder refuses to license it.

6.2.2 PBR Regulations

Section 59 of the PBR Act empowers the Minister responsible for Agriculture to make regulations for effective implementation of the Act the task he accomplished in 2008 after following laid down procedures for this purpose. Although the regulations became operational five years after the Act came to force, the office of the Registrar was allowed to continue implementing the Act while the Regulations were being drafted.

6.3 Institutional framework

Section 5 of the PBR Act establishes an independent plant variety protection office within the ministry responsible for agriculture known as the Plant Breeders' Rights Registry which is responsible for administration of plant variety protection system. The independence of the arrangement is designed to provide a neutral and efficient body within the government structure to administrate PVP issues. The office falls under the Ministry of Agriculture Food Security and Cooperatives due to the fact that the Ministry is more placed to deal with plant variety matters than any other government Ministry. Section 4 of the Plant Breeders Rights empowers the Minister to appoint the Registrar who heads the Plant Breeders' Rights Office. The main functions of the Registrar include:

- Granting of plant breeders rights
- Maintaining a register of plant breeders' rights
- Maintaining a documentation centre for public scrutiny and access on plant breeders' rights information
- Facilitation of transfer and PBR licensing, and
- Collaborates with national and international bodies on PBR matters
- Working as the Secretariat of the Plant Breeders' Rights Fund.

Section 10 of the PBR Act establishes the Plant Breeders Rights Advisory Committee comprising of members representing all major stakeholders of the plant breeders' rights system including representatives of farmers and seed producers. Its major functions are:

- To advice the Minister on the enforcement of the Act;
- To receive Reports from the Registrar on the grant of PBR;
- To make expert consideration on the grant of PBR reports and tests leading to the grant;
- To advise the Registrar on the grant of PBR.

In addition, section 48 of the Act establishes the Plant Breeders Rights Development Fund which is administered by the Plant Breeders Rights Advisory Committee. The main objective of the fund is to give grants to private and public breeders to enable them develop varieties that meet conditions for protection.

6.4 Plant Breeders Rights Development Fund

The Plant Breeders Rights Development Fund became operational towards the end of 2007 after the Ministries responsible for agricultural matters and Finance agreed to establish the Fund as required by the Law. In addition to application fees that are paid to the Fund, the government has been contributing an average of US \$ 55,000 annually as seed money. This amount is not sufficient to support the intended objective of supporting interested plant breeders to initiate or finalize on going plant breeding work. The Fund is currently processing 2 applications for grant to support plant breeding and related activities. The money has enabled the Fund to put in place a system that will be used to meet its intended goals. The funds have also been used to create awareness among beneficiaries as well as potential public and private donors who have promised to start contributing to the Fund in the near future.

6.5 Achievements and Challenges

The PBR system in Tanzania effectively started in January 2005 when the PBR Office was established following appointment of the Registrar as required by law. The Law does not provide for the minimum qualifications that the candidate for the position of the Registrar must possess. Based on the qualifications possessed by the incumbent Registrar it is evident that the Minister used his powers to appoint some one who has sufficient knowledge in plant breeding and seed technology and who has some basic knowledge and experiences of legal matters. These qualifications and good connections with local and international players in the fields of plant breeding, seed technology and plant variety protection have greatly contributed to a good start and steady progress made by the PBR Office in Tanzania.

Before a variety is protected as required by the PBR Act, the office conducts administrative and technical assessments. Administrative assessments include checking for correctness of application forms, verification for novelty of a particular variety and payment of application fees as shown table 2.

Table 2. Prescribed Fees and related Charges

S/No	Type of Fees	Amount (US\$)
1.	Application for a grant of PBR	200
2.	Application for a Provisional Protection	300
3.	For technical evaluation of a variety (DUS)	600
4.	Annual maintenance fee	200
5.	Purchase of a report from a testing authority in another country	320
6.	Replacement of lost or destroyed certificate	40
7.	Claim of priority from a preceding application outside Tanzania	20
8.	For change of an approve denomination	80
9.	Reinstatement of an abandoned application on petition	80
10.	Surcharge for late payment	60
11.	Application for a compulsory license	70
12.	Application for extension of the period of a grant	100
13.	Inspection of register and documents	40
14.	Duplicate page of register or documents	0.50
15.	Grant for Plant Breeders Rights certificate	240

As for technical assessments, the office works very closely with the Tanzania Official Seed Certification Institute (TOSCI) to carry out tests to establish if a variety in question is

distinct, uniform and stable. The office has so far received 36 applications (table 3) from both public and private research institutions and granted twenty five (25) titles.

Table 3. Applications Received from Various Institutions¹⁸

Applicant/Institution	Public/Private	Crop Species	Number of applications	Remarks
Ministry of Agriculture	Public	<i>Zea mays</i> L. (Maize)	5	All are locally developed varieties
		<i>Anacardium occidentale</i> L. (Cashew)	16	All are locally developed varieties
		<i>Sesamum indicum</i> L. (Sesame)	2	All are locally developed varieties
		<i>Phaseolus vulgaris</i> L. (French Beans)	1	Locally developed variety
		<i>Lycopersicon esculentum</i> P. Mill (Tomato)	1	Locally developed variety
Sub-Total			25	
Sokoine University of Agriculture	Semi-autonomous	<i>Phaseolus vulgaris</i> L. (French Beans)	2	All are locally developed varieties
Tanzania Coffee Research Institute (TAcRI)	Private	<i>Coffea arabica</i> (Coffee)	9	Locally developed varieties
Total			36	

Although the office has made some notable achievements in putting the system in place and making it operational, there are still a number of challenges that need be sorted out in order to achieve the intended objectives. The main challenge facing the system is how to increase number of local and foreign applications for plant breeders' rights. Low number of local applications for PBR compared to number of officially released varieties (table 4) is attributed to lack of sufficient resources allocated to national research institutions for breeding work. There is also a lack of awareness on the importance and benefit of the PBR system among local breeders. To-date the office has not received any foreign application due to lack of trust among international breeders due to the fact that Tanzania is not yet a UPOV member. This matter has been discussed at length by government through the Ministry responsible for Agriculture and stakeholders through a number of forums and a decision has been reached that the country should join UPOV and in order to achieve this internal administrative and legal processes have already been initiated. The process involves amending the current Act to comply with provisions of the UPOV Convention of 1991.

Tanzania intends to join UPOV for two main reasons. One is to increase investments in plant breeding and agriculture in general by raising trust among local and foreign breeders who believe in the effectiveness of UPOV system of plant variety protection. The other reason is the fact that Tanzania and other developing nations can only participate and influence international policy decisions on plant variety protection and utilization of plant genetic resources by becoming part of the system, otherwise in one way or the other, other countries will be making rules for Tanzania.

¹⁸ Till January 2009.

Table 4. List of Officially Released Varieties of Selected Crops in year 2005-2008

Species: Maize (*Zea mays L.*)

Variety	Year of release	Owner(s)/Maintainer and seed source	Special attributes/Disease reaction
PAN 4 M-17	2004	Pannar (Pty) Ltd	Good resistant to Cob rots, Leaf blight (<i>Helminthosporium turcicum</i>), and Leaf Rust Good adaptability, stress tolerance, lodging resistance, and prolificacy
PAN 4M-19	2004	Pannar (Pty) Ltd	Good resistant to Cob rots, Leaf blight (<i>Helminthosporium turcicum</i>), and Leaf Rust
UH 6303	2004	ARI-Uyole	Good resistant to Leaf blight (<i>Helminthosporium turcicum</i>), and Grey Leaf Spot
Longe 6H	2004	Finca Seed Ltd	Drought tolerant Good poundability Early maturity
TAN H611	2006	Tanseed International Ltd	Good resistance to Maize streak virus, Turcicum leaf blight, Cob rots, Grey leaf spot and Common rust Has twice level of essential amino acids: Lysine and Tryptophane than normal maize
TAN 250	2006	Tanseed International Ltd	Excellent resistance to Maize streak virus and Grey leaf spot, good resistance to Turcicum leaf blight, Cob rot and Common rust
TAN 254	2006	Tanseed International Ltd	Good resistance to Maize streak virus, Turcicum leaf blight, Cob rots, Grey leaf spot and Common rust
VUMILIA K1	2007	ARI Selian	Very good resistant to Maize Sreak Virus
VUMILIA H1	2007	ARI Selian	Good resistant to Maize Sreak Virus, cob rots, leaf blight and rust
WH 505	2007	Western Seed Co. Ltd	Tolerant to Maize Streak Virus, Leaf blight, and rust
WH 502	2007	Western Seed Co. Ltd	Tolerant to Maize Streak Virus, Leaf blight, and rust
WH 403	2007	Western Seed Co. Ltd	Tolerant to Maize Streak Virus, Leaf blight, and rust

Species: Paddy (*Oryza sativa*)

Variety	Year of release	Owners/Maintainer and seed source	Special attributes
Kalalu	2006	SUA	Resistant to Rice Yellow Mottle Virus and Rice blast
Mwangaza	2006	SUA	Resistant to Rice Yellow Mottle Virus and Rice blast

Species: Wheat (*Triticum aestivum*.L)

Variety	Year of release	Owner(s)/Maintainer and seed source	Special attributes/Disease reaction
Riziki –C ₂	2006	ARI Selian	Moderate resistant to Stripe rust, Stem and Leaf rust
RIZIKI – C ₁	2006	ARI Selian	Moderate resistant to Stripe rust, Stem and Leaf rust
Lumbesa	2006	ARI Selian	Moderate resistant to Stripe rust, Stem and Leaf rust

Species: Bean (*Phaseolus vulgaris* L.)

Variety	Year of release	Owner(s)/Maintainer and seed source	Special attributes/ Disease reaction
Pesa	2006	SUA	Moderate resistant and Angular Leaf Spot. Resistant to Bean Common Mosaic Virus and short to modern cooking time
Mshindi	2006	SUA	Moderate resistant to Angular Leaf Spot and Resistant to Bean Common Mosaic Virus Has short to modern cooking time
Selian 05	2005	ARI Selian	Resistant to Bean rust, Anthracnose, Mosaic Virus, and Halo blight
SELIAN 06	2007	ARI Selian	Resistant to Bean rust, Anthracnose, Mosaic Virus, and Halo blight
CHEUPE	2007	ARI Selian	Resistant to Bean rust, Anthracnose, Mosaic Virus, and Halo blight

Species: Sesame (*Sesamum indicum* L.)

Variety	Year of release	Owner(s)/Maintainer and seed source	Special attributes/Disease reaction
Lindi 02	2006	ARI Naliendele	Tolerant to leaf spots, <i>Cercoseptoria sesame</i> , stem rot, and <i>Fusarium</i> spp. Susceptible to Flea beetles, (<i>Alocyphe bimaculate</i>) Good oil content: 55.61 %

Species: Coffee (*Coffea arabica*)

N 39-2	2005	TaCRI	Resistant to Coffe Berry Diseases (<i>Colletotrichum kahawae</i>), Leaf rust (<i>Hemileia vastatrix</i>), Added advantage in bean size
N 39-3	2005	TaCRI	Resistant to Coffe Berry Diseases (<i>Colletotrichum kahawae</i>), Leaf rust (<i>Hemileia vastatrix</i>), Added advantage in bean size
N 39-4	2005	TaCRI	Resistant to Coffe Berry Diseases

			(<i>Colletotrichum kahawae</i>), Leaf rust (<i>Hemileia vastatrix</i>), Added advantage in bean size
N 39-5	2005	TaCRI	Resistant to Coffe Berry Diseases (<i>Colletotrichum kahawae</i>), Leaf rust (<i>Hemileia vastatrix</i>), Added advantage in bean size
N 39-6	2005	TaCRI	Resistant to Coffe Berry Diseases (<i>Colletotrichum kahawae</i>), Leaf rust (<i>Hemileia vastatrix</i>), Added advantage in bean size
N 39-7	2005	TaCRI	Resistant to Coffe Berry Diseases (<i>Colletotrichum kahawae</i>), Leaf rust (<i>Hemileia vastatrix</i>), Added advantage in bean size
KP 423-1	2005	TaCRI	Resistant to Coffe Berry Diseases (<i>Colletotrichum kahawae</i>), Leaf rust (<i>Hemileia vastatrix</i>), Added advantage in bean size
KP 423-3	2005	TaCRI	Resistant to Coffe Berry Diseases (<i>Colletotrichum kahawae</i>), Leaf rust (<i>Hemileia vastatrix</i>), Added advantage in bean size

Species: Cashew (*Anacardium occidentale* L.)

Variety	Year of release	Ownner/Maintenance and seed source	Special attributes/Disease reaction
AC 1	2006	ARI Naliendele	Resistant to Powdery mildew, Anthracnose, and Die back
AC 4	2006	ARI Naliendele	Resistant to Powdery mildew, Anthracnose, and Die back
AC 4/17	2006	ARI Naliendele	Resistant to Powdery mildew, Anthracnose, and Die back
AC 10	2006	ARI Naliendele	Resistant to Powdery mildew, Anthracnose, and Die back
AC 10/129	2006	ARI Naliendele	Resistant to Powdery mildew, Anthracnose, and Die back
AC 10/220	2006	ARI Naliendele	Resistant to Powdery mildew, Anthracnose, and Die back
AC 14	2006	ARI Naliendele	Resistant to Powdery mildew, Anthracnose, and Die back
AC 22	2006	ARI Naliendele	Resistant to Powdery mildew, Anthracnose, and Die back
AC 34	2006	ARI Naliendele	Resistant to Powdery mildew, Anthracnose, and Die back
AC 43	2006	ARI Naliendele	Resistant to Powdery mildew, Anthracnose, and Die back
AZA 2	2006	ARI Naliendele	Resistant to Powdery mildew, Anthracnose, and Die back

AZA 17	2006	ARI Naliendele	Resistant to Powdery mildew, Anthracnose, and Die back
AZA 17/79	2006	ARI Naliendele	
AZA 17/156	2006	ARI Naliendele	Resistant to Powdery mildew, Anthracnose, and Die back
AZA 17/158	2006	ARI Naliendele	Resistant to Powdery mildew, Anthracnose, and Die back
AC 4/285	2006	ARI Naliendele	Resistant to Powdery mildew, Anthracnose, and Die back

6.6 Participation of Stakeholders in the Administration of PBR Act

The Ministry of Agriculture Food Security and Cooperatives, through the Plant Breeders' Rights Office, has continuously involved major stakeholders in running the office as well as in the process of improving operations of the office to implement the PBR Act. In the day to day administration of the PBR Act the stakeholders are involved through the PBR Advisory Committee which is composed of members representing various stakeholders. The Committee meets four times annually. Furthermore stakeholders are always involved before any major decision is made. Any matter that needs serious decisions is brought to the attention of the Committee where different opinions are discussed and conclusions submitted to the government for final decision. Between 2006 and 2008 the PBR Office has conducted three stakeholders' workshops to discuss the implementations of the PBR Act. The participants to the workshops included representatives of relevant government ministries, representatives of Plant Breeders' Association of Tanzania (PBAT), Tanzania Horticultural Association (TAHA) and Tanzania Seed Trade Association (TASTA). One of the most important workshops was the one held in April 2007¹⁹ to discuss report of an international study commissioned by TAHA in collaboration with the Ministry of Agriculture to assess stakeholder's satisfaction with the processes of implementing the PBR Act. Another important workshop was organized by the PBR Office in November 2008 to discuss the issue of UPOV membership²⁰. During this workshop, as it came out in other stakeholders' workshops, it was agreed that there is a need for the country to join UPOV in order to fully realize the benefits of the plant variety protection system. The opinion has been presented to the government through the Ministry responsible for agriculture and the process has already been initiated to obtain Cabinet and Parliament approval to accede UPOV Convention of 1991 and also amend the Act to comply with the requirements of the Convention.

Stakeholders were also involved during the process of developing an acceptable system for licensing of the protected public varieties to end users where draft ministerial policy paper and guidelines are now being improved through discussions with stakeholders. The policy paper is intended to put forward the procedure that will be followed to grant license to any applicant wishing to commercialize plant varieties developed and protected by government research institutions. The paper will also give formulae that will be used to charge royalties for such varieties. The ministerial guidelines will guide government institutions on how to use and share benefits arising from licensing of public varieties among institutions and individuals who contributed in one way or another in developing a particular variety.

During the initial workshops and visits to meet individual stakeholders, it was observed that the level of awareness on the existence and provisions of the Plant Breeders' Rights Act was very low among many stakeholders including local and foreign breeders and seed producers. However as the frequency of contacts between the officials of the Plant Breeders Rights Office and the stakeholders increased their awareness on the matter also went up. Stakeholders' and general public awareness was also raised through distribution of PBR brochures and leaflets as well as through the media. It was however noted that more resources are needed to enable the office to prepare and disseminate different types of communication materials. As for foreign beneficiaries such as plant breeders, it has been leant that their awareness will be effectively raised when the country joins and follows the UPOV system of plant variety protection

¹⁹ Proceedings of the TAHA Stakeholders' Workshop on PVP held in April in Arusha

²⁰ Proceedings of the PBR Stakeholders' Workshop on UPOV membership held in November 2008 in Kibaha

6.7 Regional and International Collaboration

The Plant Breeders Rights Office has established links with similar authorities in a number of countries which are implementing or are in the process of implementing plant variety protection regimes as well as international organizations related to intellectual property rights matters. As soon as the Office was established its officials were sent to Kenya and South Africa to get practical experiences from these countries which have been practicing the system for more than fifteen years. The officials and technicians of the Office have also attended courses on how to manage intellectual properties in Sweden and the Netherlands. In addition to bilateral links the office has also established useful links with international organization such as UPOV, CAS-IP and AVRDC World Vegetable Centre.

The PBR Office has also been actively involved in the process of establishing a regional plant breeders' rights system for the Southern Africa Development Community (SADC) which is made up of fourteen member states. A draft PBR protocol has been developed and is waiting for approval of the higher authority of the organization. The protocol is intended to establish a SADC Plant Breeders' Rights Office that will be able to grant rights that that will be honoured in all member countries. This kind of arrangements has been very successfully practiced by European Union where as one PBR office grants a right that is honoured in all member states. The Office has also participated in the process of harmonizing seed policies and legislation in Eastern and Central African countries. Recently the office is coordinating efforts to expand these initiatives to include all 20 members' states of African Regional Intellectual Property Organization (ARIPO). All these initiatives are aimed at reducing the cost of running a PBR system and increasing investments opportunities in the region.

The Office has also used its experiences to assist other neighboring countries who are in the process of establishing legal and institutional frameworks for the protection of plant variety. A good example of this kind of cooperation is the recent assistance extended to Zambia by organizing a tour for officials of the Seed Control and Certification Institute which is designated to oversee implementation of the country's PBR Act. In October 2008, expert from the Tanzanian PBR Office was also involved in developing draft Regulations for the operationalization of the Zambian PBR Act.

The PBR Office has initiated contacts with PBR Authorities of a number of countries including Kenya, South Africa and the Netherlands to facilitate cooperation and exchange of DUS test results in the near future.

7. Lessons Learnt and Recommendations

Based on the lessons learnt from the findings of the study, the following recommendations are made for the benefit of the NPI countries that are practicing or intending to put in place a plant variety protection system:

1. A baseline study like the one conducted by the Ministry responsible for agriculture is necessary in order to decide whether or not there is a need for a plant variety protection system in a particular country
2. Internal consultations are necessary before a decision is to put in place a plant variety protection system
3. It is important to invest in physical infrastructure development and human resources through provision of short and long term trainings in order to build a credible plant variety protection system
4. In order for the country to benefit from the plant variety protection legal and institutional framework put up by a particular legislature, the authorities must continue to create awareness among stakeholders and the public in general
5. Although the Article 27 (3) (b) of the WTO's TRIPS Agreement requires each country to put in place an effective *sui generis* system for the protection of plant varieties, each country must carefully study and choose an appropriate option that will produce maximum benefits. Countries should not just decide to put up a legal system just to meet TRIPS deadlines because putting up and running a plant variety protection system is a very expensive exercise.

6. Regional collaboration may reduce the cost of putting up and running a plant variety protection system.
7. Furthermore wherever possible putting up and running a single plant variety protection office for a region is more cost effective and appropriate for increasing foreign direct investment in the region due to increased market size.
8. Since not all plant varieties meet conditions for protection, all research institutions should develop an IP policy that will give guidance on access and benefit sharing of innovations and are not covered under PVP legal regime.

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Acknowledgements

I wish to acknowledge the contributions of many players who in one way or another contributed to the successful completion of this report. In particular I would like to thank my employer, the Ministry of Agriculture Food Security and Cooperatives, for allowing me to take part in this collaborative study assignment and for availing important information used in this report. I also thank CAS-IP for the financial and valuable moral support extended to me. I am also indebted to the NPI members who participated in the National Initiative Workshop held in January in Mombasa, Kenya for their suggestions which have been used to improve the study report.

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Recommended citation:

Patrick Ngwediagi. 2009. Establishment of a Plant Breeders' Rights System in Tanzania: Achievements and Challenges. In: CAS-IP NPI. 2009. Institutionalization of Intellectual Property Management: Case Studies from four Agricultural Research Institutions in Developing Countries. CAS-IP, Rome, Italy.

The CAS-IP National Partners Initiative (CAS-IP NPI) and the publication of the working papers have received funding from the Dutch Ministry of Foreign Affairs (Cultural Co-operation, Education & Research Department) under grant agreement DCO/OC-354/07

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