

Exploring Components and Elements of *Sui Generis* Systems for Plant Variety Protection and Traditional Knowledge in Asia

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ABBREVIATIONS AND ACRONYMS

ABS: Access and Benefit Sharing
ASEAN: Association of South-East Asian Nations
BMC: Biodiversity Management Committee, India
Bonn Guidelines: Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilisation
CBD: United Nations Convention on Biological Diversity
CGIAR: Consultative Group on International Agricultural Research
Disclosure Requirement: A proposed patent (or plant variety protection) requirement that applicants disclose the source and/or country/place of origin or legal provenance of genetic resources used in an invention
DUS: Distinctness, Uniformity and Stability (of plant varieties)
EDV: Essentially Derived Varieties
FAO: Food and Agriculture Organisation
FTA: Free Trade Agreement
GMO: Genetically Modified Organism
GURTS: Genetic Use Restriction Technologies
IARC: International Agricultural Research Centre
IBIS: Indian Biodiversity Information System
ICTSD: International Centre for Trade and Sustainable Development, Geneva
IP: Intellectual Property
IPRs: Intellectual Property Rights
ITPGRFA: International Treaty on Plant Genetic Resources for Food and Agriculture
MSSRF: M.S. Swaminathan Research Foundation, India
MTA: Material Transfer Agreement
NGO: Non-Government Organisation
OTOP: One Tambon One Product Initiative, Thailand
PeBR: People's Biodiversity Register
PIC: Prior Informed Consent
PVP: Plant Variety Protection
PVPFR: The Plant Variety Protection and Farmers' Rights Act of India
R&D: Research and Development
SRISTI: Society for Research and Initiatives for Sustainable Technologies and Institutions, India
TK: Traditional Knowledge
TRIPS: Agreement on Trade Related Aspects of Intellectual Property Rights
UNCTAD: United Nations Conference on Trade and Development
UPOV: International Union for the Protection of New Varieties of Plants
WIPO: World Intellectual Property Organisation
WTO: World Trade Organisation

EXECUTIVE SUMMARY

The main objective of this paper is to outline components and elements of *sui generis* Plant Variety Protection (PVP) systems and measures to protect traditional knowledge (TK) based on recent experiences in Asia. One of the main outcomes of this paper is the demonstration that developing countries have options with regards to PVP and the legal handling of TK. While some governments in Asia have already adopted patent or International Union for the Protection of New Varieties of Plants (UPOV) standards for PVP, others may wish to develop unique systems which respond to the diverse needs of the country's farmers and local communities. To date the response throughout Asia reflects its diversity.

A number of Asian countries have developed UPOV-style laws or have joined and ratified UPOV. Whilst this helps satisfy their commitments to the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS), there have been various criticisms of the appropriateness of UPOV plant variety protection systems for developing country needs. The UPOV model provides a generic solution, meaning that initially it is likely to be easier to administer, but in the long run could end up only protecting the interests of large-scale commercial breeders and biotechnology companies. A number of these countries have utilised the flexibilities in UPOV and TRIPS to include additional elements in their laws that address their concerns. For example, they have included "disclosure of source and/or origin requirements" (in the Indian, Thai, Singaporean and Vietnamese laws), farmers' rights elements (see the Indian law), prior informed consent (PIC) procedures and access and benefit sharing (ABS) arrangements. Some countries from the region have opted to develop truly unique laws for PVP – most notably India and Thailand. Across Asia a range of other related agro-biodiversity, community and indigenous rights laws are also being developed, which could see a broader range of rights-based approaches offering protections for indigenous and local communities, and over TK.

Drawing on the experiences of different countries throughout Asia, this paper suggests a range of potential components and elements that can be introduced into *sui generis* laws for PVP and TK. For simplicity, throughout the paper the main recommendations of each section have been summarised for consideration. Namely, countries might extend PVP coverage to cover domestic or extant varieties and farmers' varieties (including both local and wild). They may wish to explicitly detail requirements for access to genetic resources, as well as benefit sharing arrangements arising out of their utilisation and commercialisation. Countries will need to carefully consider how to equitably distribute funds or other non-monetary benefits via appropriately administered funds, directly to communities (where the variety has a limited distribution), or by establishing beneficial projects for farmers. A range of other incentives could

be offered (as part of a *sui generis* law or separately) by the government or other projects to actively promote the breeding, development and consumption of domestic, local and wild varieties. These could include government support of research and breeding programmes, support of traditional seed exchange networks, providing standard labelling and indicative marks, establishing “protected commons”, or by targeting consumers.

Prior informed consent procedures provide an important process for the respect of sovereign state control over genetic resources, as well as for local community or farmer control. Countries could explicitly detail elements such as those in the Bonn Guidelines (competent authorities, timing and deadlines, specification of use, procedural aspects, and mechanisms for consultation), or develop their own procedures to assure transactions are made under mutually agreed terms.

Additionally, treaties such as the International Treaty on Plant Genetic Resources for Food and Agriculture, and laws in countries such as India, provide impetus for the protection of farmers’ rights. These laws explicitly allow farmers to save, use, sow, resow, exchange, share, or sell their farm-saved seed. *Sui generis* laws may include elements for the protection of traditional agricultural knowledge, as well as the inclusion of farmers in decision-making and policy-making. Other elements which are relevant to farmers’ rights might include the restriction of potentially harmful technologies, and technologies contrary to the maintenance of public order. In India, for example, Genetic Use Restriction Technologies (GURTS) have been restricted by law. Deceptive or misleading marketing practices may also impinge upon farmers’ rights to food sovereignty, and such practices have been targeted by PVP laws in India and Vietnam.

It is likely that the protection of TK cannot be achieved through any singular means. Because we are generally referring to biodiversity-related TK here, the protection of genetic resources often entails protection of TK either explicitly or implicitly. Therefore a combination of the above components (i.e. a disclosure of source/origin requirement, ABS measures, PIC, promotion of local and domestic innovations, and farmers’ rights provisions) will have cumulative effects towards TK protection and promotion. Additional measures could include having accessible and clear databases and registries containing information on genetic resources, their distribution, associated TK, and potentially even associated customary protocols. The documentation or at least recognition of customary protocols could help strengthen community and indigenous rights, as could more explicit legal assertions such as those in the Philippines.

Countries may wish to draft different *sui generis* laws for PVP and TK protection. Indeed, a one-size-fits-all law may be inoperable or dysfunctional by attempting to resolve too many concerns. Countries also need to recognise that over-

regulating agricultural genetic resources may have the negative consequence of discouraging innovation, and may be contrary to the historical interdependence between countries regarding the sharing of germplasm. National authorities will need to balance these factors against desires to ensure sovereign control of biological resources. Therefore a careful selection of the most pertinent *sui generis* components and elements would be prudent, in order to balance the promotion of agricultural innovations and the protection of broader public interests.

National authorities should continue to closely watch the regulatory development of PVP and biodiversity laws, particularly in India and Thailand. Both these countries are on the verge of advancing the implementation of *sui generis* laws, which has been a considerable challenge to date. The Thai PVP law (favouring liability rather than exclusive property protections) in particular presents a model which has fewer substantial administrative burdens, and would be suitable for most developing countries in Asia.

1. INTRODUCTION AND BACKGROUND

Intellectual property (IP) protection of plant varieties and biotechnological innovations raises a set of issues that are critical to the sustainable development and economic growth of developing countries. Intellectual property also raises concerns for traditional local groups and farmers' networks within these countries, relating to their local economies, control over agricultural inputs and debt, farmers' rights, promotion and protection of their knowledge and innovations. There is evidence that IP rights have played a significant role in the consolidation of global seed and agricultural industries¹ and this has implications for, *inter alia*, public policy agendas, the potential economic and environmental impact of genetically modified (GMO) plants, the protection of traditional knowledge (TK), food security, seed prices, research and development (R&D) and technology transfer. Many policy-makers have also noted that patents and International Union for the Protection of New Varieties of Plants (UPOV) model Plant Variety Protection (PVP) are more suitable for advanced breeding and biotechnological innovations, rather than the traditional, incremental, small-scale and non-commercial breeding common in developing countries.

World Trade Organization (WTO) Members have several options derived from Article 27.3(b) of the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) for the protection of plant varieties. These include allowing patent protection, or specific forms of PVP. Plant Variety Protection laws may include those based on the UPOV model, nationally developed *sui generis* plant variety protection schemes as well as agro-biodiversity laws. The legal obligations contained in various international agreements, including the TRIPS, UPOV, the UN Convention on Biological Diversity (CBD), and the Food and Agriculture Organization (FAO) International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), have created a complex web of obligations for the access to and use of genetic resources, as well as the products and technologies derived from such resources. Other regional or bilateral agreements, including Free Trade Agreements (FTAs), the Association of South-East Asian Nations (ASEAN) Draft Agreement on Benefit Sharing (2000), and other less formal ties, may also shape national obligations considerably.

This paper contributes to the UNCTAD-ICTSD Regional Research Agenda, and responds to a request for further analysis into PVP and TK issues raised at the Hong Kong Regional Dialogue on Intellectual Property Rights, Innovation and Sustainable Development, held in November 2004.² This paper explores a range of potential components and elements of *sui generis* systems for PVP and TK protection in Asia, which arise from this suite of issues and related legal obligations. The paper focuses primarily on the development challenges which many of these countries face. By utilizing a regional perspective, it is possible to

make coherent linkages between countries with both common concerns, and shared bio-geographical distributions of plants, and contrasting cultural influences, local contexts and environments.

There have been wide ranging responses to these obligations and concerns throughout Asia. Governments have typically attempted to balance demands for protection of plant breeders' rights and agricultural industry innovations, both domestic and foreign controlled, with smallholder farmer and local breeder concerns. Achieving practical and effective regulatory systems which reflect the interests of all these groups is a highly complex task. Already a number of countries in Asia have attempted to develop and implement their own *sui generis* systems (see Chapter 2), in which there has been considerable progress. Often these laws, or some of their components, have been spurred by the campaigns of NGOs, activists and local farmers' networks. In fact, a number of key individuals (e.g. Gupta, Shiva, Swaminathan, Khor, Lianchamroen), organisations (e.g. SRISTI, Navdanya, SEARICE, MASIPAG, Third World Network, BioThai) and governments (particularly India, the Philippines and Thailand) from different parts of Asia have proven highly influential and have shaped progress towards new approaches, projects and legal mechanisms. They have drawn the attention of policymakers and stakeholders across the globe. However, a range of issues are still problematic in practice; for example, the equitable distribution of benefits arising from the use of plant genetic resources, prior informed consent (PIC) procedures, farmers' rights issues, promotion of local and domestic plant varieties, and the protection of TK, amongst others. In response to these concerns, these regulatory systems continue to evolve quite rapidly.

A number of other authors have suggested options for *sui generis* systems,³ and have provided some preceding concepts for potential legal components. This paper therefore details the obligations placed upon countries in brief, followed by an overview of existing national *sui generis* systems in Asia, and then the majority of the paper suggests further possible elements of a *sui generis* system. An emphasis is placed upon finding innovative mechanisms which may benefit both sovereign state bodies and local communities or farmers networks in the region. The suggestions may therefore go substantially further than the minimum requirements of the main international laws in this field.

1.1 Paper Objectives

The paper has four major objectives:

- i) To provide a short overview of existing national initiatives and experiences for *sui generis* plant variety and traditional knowledge protection. Some key non-government projects are also noted;
- ii) To review and identify possible components and elements for *sui generis* systems of plant variety and TK protection. This is undertaken in order to establish an understanding of legal issues, and to ensure that state sovereign rights and rights of indigenous and local communities are recognised and adequately protected;
- iii) To establish linkages between formal rights and protection systems (e.g. PVP systems, legal protection of farmers' rights), and informal systems such as customary farmer practices of seed exchange;
- iv) To identify options for protection and promotion of informal plant innovation systems, including domestic and local plant varieties.

1.2 International Obligations

WTO Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS)

With 150 states now members of the WTO, the TRIPS Agreement (1994) has considerable implications for the majority of the world. The main concern of this paper is the obligation on members to allow for *sui generis* non-patent protection of plant varieties.⁴

Article 27.3(b) indicates 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 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.*⁵

The drafting of the Article in these terms reflected some conflicting concerns. These included the strong interests of some developed countries towards ensuring biotechnological innovations could be protected, some differences within this group of countries with regards to the scope of protection, and the concerns of many developing countries about the patentability of life forms (UNCTAD-ICTSD, 2005).

In the TRIPS Agreement, there is no further explanation as to what constitutes an “effective” *sui generis* system, and therefore there is considerable scope for the development of truly unique national systems. Neither does TRIPS elaborate on the term “plant varieties”, nor does it obligate members to become a member of UPOV, or to draft legislation identical to the UPOV Acts (see the following section).

It is generally accepted that to be an “effective *sui generis* system”, PVP must be afforded as a system of legal rights (e.g. IP rights, or liability rules), which have typically been similar to existing systems like UPOV.⁶ Also the system must accord to principles of national treatment and most-favoured-nation treatment, and must provide some sort of enforcement mechanism. But because TRIPS establishes a series of *minimum* requirements of protection, countries are not inhibited from developing *sui generis* systems which may include farmers’ rights provisions, respect for customary rights of local groups, TK protections, and rights to accrue benefits when plant genetic resources are accessed.

The TRIPS Agreement automatically requires a review of Article 27.3(b), which has been ongoing. Under Paragraph 19 of the Doha Declaration, this review was expanded to include examination of the relationship between TRIPS and the CBD, the protection of traditional knowledge and folklore. Recently a range of proposals have been made by primarily developing countries for patent applications to disclose the country and source of origin from which genetic materials were sourced and TK used in an invention, as well as evidence of prior informed consent, and evidence of fair and equitable benefit sharing.⁷

The International Union for the Protection of New Varieties of Plants (UPOV)

The first UPOV convention was completed in 1961 (amended in 1972), and subsequently re-drafted to establish the 1978 Act and then the 1991 Act. The UPOV conventions provide some useful starting points and templates for shaping national *sui generis* laws, even if they may not be suitable for implementation as a whole by certain developing countries. The basis for understanding and classifying different plant varieties, for example, requires definition of the subject matter. While the 1978 Act was silent on the definition of “variety”, the 1991 Act describes a plant variety as a:

...plant grouping within a single botanical taxon of the lowest known rank, which grouping, irrespective of whether the conditions for the grant of a breeders’ right are fully met, can be:

- *Defined by the expression of the characteristics resulting from a given genotype or combination of genotypes,*

- *Distinguished from any other plant grouping by the expression of at least one of the said characteristics, and*
- *Considered as a unit with regard to its suitability for being propagated unchanged.*

Because it is not always clear what defines a plant variety, and because it has been poorly defined in the past, this is a useful definition. It may be instructive for the drafting of national *sui generis* laws and even allows scope for the recognition of landraces or wild varieties.⁸ In order to protect new plant varieties, UPOV has more specific requirements.

Authors such as Dutfield (2004) and Rangnekar (2000) have been critical of the successive UPOV Conventions for altering protection requirements to favour more technologically advanced breeders over other farmers, and which provide perverse incentives to grow genetically uniform crops. The criticisms directed towards these changes, mainly between the 1978 and 1991 Acts, warrant some brief examination.

To be eligible for protection under the 1978 UPOV system (Art. 6), the plant variety must be “clearly distinguishable” (i.e. distinct from other varieties of “common knowledge”), “sufficiently homogenous” with regard to features of sexual reproduction and vegetative propagation, and “stable in its essential characteristics” through cycles of reproduction and propagation. Under the 1991 Act (Art 6-9), the plant variety must be novel, distinct, *uniform* in its relevant characteristics, and stable (known as distinctness, uniformity and stability, or “DUS” requirements). The more specific uniformity requirement of the 1991 Act has been criticised for encouraging advanced commercial and genetically uniform crop breeding.

The 1991 UPOV text also strengthens protection by widening the array of subject matter. The protection covers not only the propagating material of the protected variety, but also (unlike the 1978 Convention) the harvested material (including entire plants and parts of plants), the products made directly from harvested material of the protected variety, and “essentially derived varieties” (Changtavorn, 1998). The protection of essentially derived varieties (EDV)⁹ has been the subject of some debate. The concept allows the protection of cosmetic modifications on already protected varieties, subject to permission from the breeder of the “initial variety”. Dutfield (2004:35) explains that the breeder of protected variety A has a right to demand that the breeder of variety B secure their authorisation to commercialise variety B if it was essentially derived from A. Essentially derived varieties are somewhat controversial because there is still little consensus over the genetic conformity threshold required for identification of EDVs from initial varieties of crops.¹⁰ Potential incremental modifications on the initial variety are most likely, for example, “by the selection of a natural or

induced mutant, or of a somaclonal variant, the selection of a variant individual from plants of the initial variety, backcrossing, or transformation by genetic engineering" (UPOV, 1991 Act. Art. 14(5)(c)). The provisions seem to respond primarily to biotechnological capacities for mutating or engineering an initial variety. Essentially derived variety protection means that breeders or biotechnologists will not be able to get away with making a minor modification on an initial variety, protecting and commercialising it, without seeking the approval of the original breeder. Ramanna and Smale (2004) reveal the suggestion from Indian NGOs that within EDV provisions under their PVP law, the parent genetic material contributed by rural and tribal peoples could be included in the definition of "initial variety". However, the protection of general domestic or farmers' varieties from free-riding is not UPOV's intention.¹¹

Breeders' rights are also extended under progressive UPOV Conventions. Under UPOV 1978 (Art. 5), the scope of protection of the breeders' right is for "the production for purposes of commercial marketing; the offering for sale; and the marketing of the reproductive or vegetative propagating material, as such, of the variety". Under pressure from plant breeders, the 1991 version extended the scope of the breeders' rights by increasing the number of acts for which prior authorisation of the breeder is required, including production or reproduction; conditioning for the purpose of propagation; offering for sale; selling or other marketing; exporting; importing; and stocking for the above purposes (Dutfield, 2004). Furthermore the UPOV 1991 version extends protection from at least 15 years to a minimum of 20 years.

The farmers' exemption (or farmers' privilege) allows farmers to keep propagating materials for sowing in a following season. The 1991 UPOV text (Art. 15) defines the farmers' exemption more carefully than the previous text, by allowing a farmer to use, for propagating purposes only on his holding, the product of the harvest which he has obtained by planting, on his holding, the protected variety or essentially derived variety. This limits the scope for farmers to save, exchange or sell their seeds to other farmers, where they have used protected materials (known as "brown bagging"). National bodies have the right to determine whether to implement the farmers' privilege.

The Convention on Biological Diversity (CBD)

The CBD was drafted at the Rio Earth Summit in 1992 and came into effect in 1993. It establishes and binds its parties to a range of important principles relating to biodiversity. First, it affirms the sovereign rights of states over natural resources (Art. 15). Thus state parties have the right to determine access regulations to biological resources. The fact that plant genetic resources are replicable and that many plants or genes are not endemic to the one country

(either naturally or through trade), means that the exclusiveness of the access rights are only as good as the countries controls (such as customs).¹²

Article 15.5 requires that “access to genetic resources shall be subject to prior informed consent of the Contracting Party providing such resources, unless otherwise determined by that Party”. In subsequent CBD Conferences of the Parties, in Ad Hoc meetings and in the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising out of their Utilization (Bonn Guidelines; 2002), an emphasis has been placed on extending PIC to the local custodians of genetic resources and TK holders through national laws. Article 15.7 then also specifies the need for fair and equitable benefit sharing arising out of the R&D of genetic resource innovations, under mutually agreed terms. The principles of PIC and benefit sharing have since spread through discussions in other fora (such as the WTO TRIPS Council and World Intellectual Property Organisation (WIPO)), as well as national *sui generis* laws for PVP and biodiversity regulation.

Article 8 of the CBD relates to *in situ* conservation, that each Contracting Party shall, as far as possible and as appropriate:

(j) Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilisation of such knowledge, innovations and practices.

The protection of TK associated with biological diversity represents a range of complex challenges. The principles aforementioned relating to access and benefit sharing (ABS), PIC and discussions on a disclosure of origin requirement all provide some important tools which could protect and promote TK. But there are also more sensitive issues relating to the respect of customary protocols of indigenous and traditional local groups, cultural concerns over secret or sacred knowledge with spiritual connections to nature, and the protection of the rights of these groups more broadly. Given the breadth of cultural and jurisprudential diversity expressed by these many groups, it may be particularly difficult to develop international laws which can do justice to their concerns.¹³ There is therefore significant scope for innovative national and local initiatives to protect and promote TK.

The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)

The ITPGRFA was completed in 2001 and came into force only recently, in 2004, following its ratification by 40 governments. The ITPGRFA is administered by the Commission on Genetic Resources for Food and Agriculture of the FAO. From Asia, only Bangladesh, Bhutan, and India have ratified the Treaty, with several other countries participating only as signatories. Many countries seem to have adopted a “wait and see” attitude whilst the Parties to the ITPGRFA resolve issues of implementation.

The ITPGRFA has a number of notable features including the creation of a Multilateral System of ABS over a range of listed plant genetic resources for food and agricultural purposes. Parties which ratify the international treaty effectively open up their agricultural plant genetic resources to access via a Standard Material Transfer Agreement (MTA) (Art. 12.4, ITPGRFA). The Multilateral System also covers the *ex situ* collections¹⁴ in gene banks of the International Agricultural Research Centres (IARCs) of the Consultative Group on International Agricultural Research (CGIAR).

The Standard MTA was adopted in June 2006 at the first session of the Governing Body.¹⁵ The Standard MTA establishes a contract between the provider and recipient of plant genetic resource products for food and agriculture incorporating materials¹⁶ or any of its genetic parts or components that are ready for commercialisation (Art. 2, Standard MTA). This excludes commodities and other products used for food, feed and processing.

Relating to the provision of materials, the provider should submit all available passport (transfer) data, and descriptive information about the materials (Art. 5, Standard MTA). Access to these materials protected by intellectual property rights (IPRs) must be consistent with international and national laws. During the period of plant genetic resource *development*,¹⁷ including material being developed by farmers, access is at the discretion of its developer. The recipient must use the materials only for the purposes of research, breeding and training for food and agriculture, and must not claim IPRs that may limit the facilitated access to the materials or their components (Art. 6, Standard MTA). In cases where a recipient commercialises a product they must pay one point one per cent (1.1%) of the sales of the product, less thirty per cent (30%) to be paid to the Trust Account of the Governing Body (Annex 2, Standard MTA).

The Multilateral System coordinates benefit sharing (Art.13, ITPGRFA) through a range of mechanisms: exchange of information; access to and transfer of technology; capacity building; and the sharing of monetary and other benefits arising from commercialisation. This is administered under the guidance of a

Governing Body, composed of all contracting parties (Art. 19, ITPGRFA), which has a rolling Global Plan of Action (Art. 14, ITPGRFA). Under the ITPGRFA, benefit sharing arrangements are currently being established.

Article 17 of the ITPGRFA also calls on Parties to collaborate with each other to develop a Global Information System on plant genetic resources for food and agriculture, to complement those already existing in the IARCs.

The ITPGRFA also recognises farmers' rights, and encourages parties to take measures that protect and promote them (Art. 9, ITPGRFA). These include: protection of TK relevant to plant genetic resources for food and agriculture; the right to equitably participate in sharing benefits arising from the utilisation of plant genetic resources; the right to participate in decision making at the national level; and the right to save, use, exchange and sell farm-saved seed/propagating material, subject to national law and as appropriate. Because the ITPGRFA has only recently come into force, and due to its still limited membership (53 ratified Parties as of January 2007), its full impact remains as yet uncertain.

2. EXISTING NATIONAL *SUI GENERIS* INITIATIVES IN ASIA

There are numerous different interpretations of what *sui generis*¹⁸ can mean due to the ambiguous scope allowed by TRIPS. Throughout Asia there are a range of different *sui generis* approaches to PVP. Some countries have ratified UPOV; many countries have developed UPOV-style PVP systems; and a few countries have drafted truly unique *sui generis* systems which differ considerably from the UPOV model. These systems may also include elements for the protection of agricultural TK, and additionally there may be other *sui generis* laws which cover related areas such as traditional medicines, agro-biodiversity, agro-forestry, community or indigenous rights. This chapter introduces a range of these laws in brief, with further discussions in subsequent chapters.

UPOV-style *Sui Generis* Systems

There are a range of PVP laws in Asia that model themselves on the UPOV 1978 or 1991 systems. Some have done so by ratifying the Agreement, whilst others have simply reproduced many of the concepts for their own law without actually becoming a signatory. Bilateral treaties and FTAs with developed countries are increasingly coercing countries towards UPOV protection or similar.

Asian countries that have become members of UPOV¹⁹ include China (1978 Act, not including Hong Kong Special Administrative Region), Japan (1991 Act), Kyrgyzstan (1991 Act), Republic of Korea (1991 Act), Singapore (1991 Act), Uzbekistan (1991 Act), and Viet Nam (1991 Act). Notably, the most technologically advanced economies in the region are members of the 1991 Act. Dhar (2002) also notes that a high proportion of UPOV signatories have a relatively low share of their economically active population engaged in agriculture, though, of Asian UPOV members, China and Viet Nam are notable exceptions. The majority of East, South and Southeast Asian countries that have not signed UPOV have large agricultural populations, and therefore important rural constituencies and livelihoods for policymakers and politicians to consider.

There tend to be commonalities in the drafting of UPOV-based laws. The UPOV 1978 and 1991 Acts indicate that the granting of the breeders' right shall not be subject to any further or different conditions than the novelty and DUS requirements, provided that "the applicant complies with the formalities provided for by the law of the Contracting Party". The extent to which members may get away with the addition of conditional "formalities" is not clear. But it seems that some additional specifications may be required under national law. For example, the Plant Varieties Protection Act of Singapore (2004), for local examination of a plant variety, requires a description of "the origin and breeding of the plant variety concerned" (Art. 17.a.i.). Provisions such as this

could be useful for determining whether appropriate transfers of genetic materials have been made (i.e. by MTA or with PIC).

The Vietnamese Ordinance on Plant Varieties (2004), based on the 1991 UPOV Act, was influenced by US and European trade agreements and pressures. The Ordinance has a similar requirement for documentation of the origin of new plant variety assays prior to protection, including details of its origin (Art. 15.4.). The law thoroughly details rules for the management and conservation of plant genetic resources (Ch.II), including access rules and authorisation required for extraction of genetic resources and rare plants. The law also prohibits “destroying or misappropriating plant gene sources, illegally exporting gene sources of precious and rare plants”, which seems an obvious response to “biopiracy” and bioprospecting misappropriation concerns. Additional elements in the law, which often comprise parts of other state plant or seed laws, include labelling requirements (Art. 39), management of the quality of plant varieties (Ch.VI), and prohibition of misleading advertisements of false information on plant varieties or plant variety qualities (Art. 9.7.). The Vietnamese law therefore provides a good example of the potential breadth of a PVP law.

China has a fairly standard UPOV-style law, but splits regulations into those which relate to agricultural crops and forest varieties. Notably the regulations also cover herbaceous medicinal materials (in the agriculture part) and woody medicinal materials (forestry part), clarifying an aspect of the food-medicines conceptual overlap which occurs in many Asian countries.²⁰

Countries in Asia which have not signed or ratified UPOV, but have UPOV-style laws, include Indonesia (2000), the Philippines (2002), Taiwan (2004), Hong Kong (1997), Sri Lanka (draft), Malaysia (2004) and Pakistan (2000). It is likely that countries draft UPOV-style laws without signing on to UPOV in order to be close to international norms whilst still maintaining flexibility in the development of their own unique legal apparatus. These actions may allow some elements that are different to the UPOV texts, creating a broader space for future lawmaking flexibilities.

Other Unique PVP and TK Systems

Countries which have truly unique PVP laws include India and Thailand. Bangladesh has also drafted a PVP law with fairly unique characteristics, but it has been amended a number of times and remains in draft form.²¹

The Indian Protection of Plant Varieties and Farmers’ Rights Act (PVPFR, 2001) has a number of interesting elements. Firstly, it accords extant (domestic and existing) and farmers’ plant varieties an exclusive protection right equivalent to

that which it accords new plant varieties (Art. 15). This values the incremental innovations and contributions that go into the development of extant and farmers' plant varieties as equal to the innovations of new plant varieties. Problems may arise here when trying to reflect the huge range of potential contributions to a plant variety from different parties, in which case it will be registered by a specific individual or cooperative (Art.14;16).²² How the registering body will be held accountable is unclear. Another key issue is whether the regulatory changes will bring a rapid halt to the traditional exchange of seeds and farmers' plant varieties.

Secondly, the PVPFR explicitly provides for the protection of farmers' rights (Art. 15), including the ability to save, use, sow, resow, exchange, share, or sell their farm-saved seed, and the prospect of rewards from a National Gene Fund. It also accords rights to communities to receive compensation if the community is found, by the PVP Authority or from registration details, to have made a significant contribution to the evolution of a protected variety (Art. 41). Other interesting features of the law include a requirement for the disclosure of complete passport (transfer) data relating to the source of the genetic material, and all information relating to the contribution of any farmers, villages or communities in the breeding of the variety, as well as a declaration that the genetic or parental material was obtained through lawful means (Art. 18). The law also prohibits the registration of Genetic Use Restriction Technologies as a plant variety.

The Thai Plant Variety Protection Act (PVP Act, 1999) provides different kinds of protection for general domestic and wild varieties, as well as local plant varieties. It is an objective of the law that all plant varieties within Thailand are subject to state sovereignty, and can be protected under one of the specific categories (new or local varieties) or under one of the general categories (domestic or wild varieties). Rather than attempting to formalise exclusive protection for all varieties, as in India, which could be a complex and controversial undertaking, Thailand has sought to provide other forms of incentives to breeders of domestic and farmers' varieties (i.e. it is closer to a liability regime than a property rights regime).²³ For general domestic and wild varieties, the Thai PVP Act (Ch.5) details ABS rules but does not allocate exclusive protection like those available in the Indian PVPFR Act. The Thai PVP Act does give more specific protection rights for registered local community varieties (Ch. 4). The community would then receive exclusive rights to conserve, use, research, sell, and commercialise if so desired, in a similar manner to a new plant variety right. The PVP Act also requires disclosure of the origin of the new plant variety, or the genetic materials used in the breeding of the variety, as a registration requirement (Sec. 19(3)). The Act also establishes a PVP Fund which accrues income from the collection, use, research or commercialisation of general domestic or wild varieties, registration fees, and

other sources (Ch. 6). The Fund is used to assist in the conservation and development of plant varieties by communities, as well as to cover other administrative expenses. The Thai PVP Act and Indian PVPFR Acts are discussed in more depth throughout this paper.

It should be noted that many of these *sui generis* laws are not yet fully implemented and therefore there is only limited experience in their administration. Many of the practicalities of their implementation, especially where new concepts are introduced, have only been half-realised. Where possible, this paper draws together the implementation experiences of these countries and makes recommendations that could expedite the process.

Additional related laws are worth mentioning and are discussed briefly throughout the paper. These include the Indian Biological Diversity Bill (2002); the Act on the Promotion and Protection of Thai Traditional Medicinal Intelligence (1999); the Biodiversity and Community Knowledge Protection Act of Bangladesh (Draft, 1998); the Pakistan Draft Law on Access and Community Rights (2004); the Community Forests Bill of Thailand (Draft, 1992; last amended 2006); the Community Intellectual Rights Protection Act of the Philippines (Draft, 2001); and the Philippines Indigenous Peoples Rights Act (1997).

3. POSSIBLE COMPONENTS AND ELEMENTS OF *SUI GENERIS* SYSTEMS FOR PLANT VARIETY PROTECTION AND TRADITIONAL KNOWLEDGE

This chapter provides an overview of the potential components and elements of *sui generis* systems for PVP and TK. These could be used in various adaptations by government officials and policymakers, academics, lobbyists, farmers groups, activists and NGOs. Ultimately there is no “one-size-fits-all” formula for PVP laws, and laws on TK protection and promotion. Their content will vary depending upon a range of factors including agrarian concerns, political pressures, trade negotiations and legal agreements, level of technology, environmental parameters, socio-economic conditions, cultural concerns and customary practices, the existence of indigenous, tribal or minority groups, and a range of other potential interests. Indeed, it may be preferable for most countries to draft a number of laws which directly address specific concerns, as has been the experience in India, Thailand and the Philippines.

The main sub-headings provide themes of common concern or interest for PVP and TK policy-makers and stakeholders. Each section provides details of potential components of *sui generis* laws, followed by a summary highlighting the main elements. Governments need to carefully consider their particular circumstances before adopting any of these elements. The discussions attempt to highlight pros and cons for each potential component considered.

3.1 Minimum Requirements and Scope of Protection

The minimum requirements will depend upon the international legal obligations imposed upon the country, as described in the first chapter of this paper. Leskien and Flitner (1997) provide an overview of minimum requirements, based on the assumption that most countries are WTO members. These include national treatment, most-favoured-nation treatment (or reciprocity), effective enforcement of rights, and the Article 27.3(b) requirement that *sui generis* systems of plant variety protection must be “effective”. Leskien and Flitner (1997:26) suggest that *sui generis* systems must grant legally enforceable rights “either to exclude others from certain acts in relation to the protected plant variety, or to obtain a remuneration in respect of at least certain uses of the plant variety by third parties”. As discussed, WTO Member states may develop further standards of protection should they wish, for example in the protection of farmers’ rights.

National treatment is a requirement of TRIPS (Art. 3). It requires that each Member must accord, to the nationals of other Member countries, treatment no less favourable than it accords to its own nationals with regard to the protection of intellectual property (ICTSD-UNCTAD, 2005:61).²⁴ Most-favoured-nation

treatment (TRIPS Art. 4), being a principle of reciprocal treatment, requires that any advantage, favour, privilege or immunity granted by a Member to the nationals of any other country should be accorded to the nationals of all other Member countries. Accordingly, *sui generis* systems of plant variety protection should apply the same standards.

Furthermore, states should consider the scope of protected materials. Countries may choose between granting protection on the propagating materials only (vegetative or reproductive materials or both), or whether to additionally allow protection of harvested material (which is optional in UPOV 1978, but required in 1991).²⁵

3.2 New Plant Variety Protection

As discussed in Chapter 2, it has become the norm to provide UPOV style plant breeders' rights protection for new plant varieties in many Asian countries. Even unique laws such as the Thai and Indian PVP Acts utilise elements for new plant variety protection which draw from the text of UPOV. In order to be an "effective" PVP system for compliance with the TRIPS Agreement, and in the spirit of encouraging innovation, countries must arguably provide for the protection of *new* plant varieties.

A "new" plant variety is generally understood to be a variety that has been bred to exhibit traits that are novel when compared to known varieties, but that also retains distinct, homogenous or uniform characteristics, and stability between breeding cycles. Depending on whether a country models its new plant variety rules on the 1978 Act (which has a homogenous requirement) or the 1991 Act of UPOV (which has a uniformity requirement) it will have slightly different registration criteria. Additionally, countries may wish to shorten the term of protection for new plant varieties to limit the breeders' exclusive rights.

Countries can and have adapted new plant variety rules from the UPOV model to suit their own interests. For example, one important aspect of the Indian PVPFR law is akin to a "disclosure of source and legal provenance requirement". Notably "disclosure" has been the subject of debate in forums such as the TRIPS Council, but with respect to international patent law.²⁶ It is also being discussed in the CBD as part of a potential International Regime on ABS, which could include certificates of origin to act as passports or permits attached to the transfer of genetic resources.²⁷ While domestic PVP requirements will not stop extraction of genetic resources to extraterritorial locations (a major concern for bio-diverse developing countries), it could restrict deceptive acts domestically, and encourage other countries to follow suit. It has been suggested that rather than using the term "origin", which might require historic investigation by the

breeder, it could be more feasible to require the source or legal provenance of genetic materials.

Under the Indian law applicants must disclose complete passport data relating to the source of the genetic material, and all information relating to the contribution of any farmers, villages or communities in the breeding of the variety (Art.18). They must also make a declaration that the genetic or parental material was obtained through lawful means. The Thai PVP Act similarly requires details of the origin of the new plant variety or the genetic materials used in the breeding process (Sec.19(3)). The Thai PVP office indicated that they are likely to accept disclosure of immediate and historical sources of origin within reason. According to these officials this should not place any substantial burden on the registering breeder in most cases, because they can easily relay these sources. Currently the Thai PVP office is only in the early stages of accepting new plant variety registrations.

Summary: *sui generis* elements for new PVP could include:

- Rules for registration similar to those of the UPOV Acts, but which develop existing flexibilities in the UPOV model (see the next two points);
- A requirement that applicants disclose the source, origin or legal provenance of genetic or parent materials, as well as the contributions of others to the evolution of the variety. This could include disclosure of any relevant TK involved;
- Different lengths of protection could be offered from those stated in the UPOV model.

3.3 Domestic (Extant) Plant Variety Protection

Domestic or extant plant varieties are generally understood to originate from within the country, with existing use and knowledge of the plant part of the public domain. Historically, domestic plant varieties have been broadly cultivated by local farmers, breeders or both (as is recognised in the Indian PVPFR law) without exclusive control over use exercised by any particular individuals or groups. The objective of a domestic/extant PVP provision is to recognise the innovations of small-scale farmer-breeders who have contributed to the development of these widespread varieties over generations of local practices. The provisions are intended to encourage ongoing cultivation of domestic varieties, and in turn allow for their conservation. Such provisions may also clarify ownership rights which were previously unspecified; seek to establish “protected commons”²⁸; or attempt to address the misappropriation or biopiracy of genetic materials and related traditional knowledge.

The extension of the concept of (new) plant breeders' rights to farmers' generic varieties is an attempt to recognise the value-added input of progressive improvements to the varieties made by farmers over generations. Depending on the approach to domestic PVP taken, it may allow farmers to be compensated or to accrue benefits upon the use of this germplasm (a liability regime – the approach primarily utilised in the Thai PVP Act) or alternatively to establish exclusive rights over the use of those varieties (a property rights regime – the main approach taken in the Indian PVPFR Act).²⁹

The Indian PVPFR law allows farmers, breeders or other stakeholders to register an "extant variety"³⁰ or "farmers' variety" for PVP provided that it conforms to DUS criteria (Art. 15). How this registering entity will be held accountable to all the potential contributors in the breeding process is unclear and problematic. If approved by the Registrar of the PVPFR Authority, the law allows conferral of an exclusive right over the variety, nearly identical to that of new varieties, but subject to a range of conditions.³¹ A number of authors have argued that this could ironically cause an "anticommons tragedy" whereby too many parties independently possess the right to exclude others from utilising the resource.³² This could lead to disputes between different groups of farmers. Since the extant variety does not necessarily need to be novel, right-holders could hypothetically gain control over a plant variety used by a wide range of other farmers, and subject them to compensation claims. It could also threaten the traditional exchange of seeds and farmers' plant varieties. NGOs, farmers' groups and non-profit bodies³³ are attempting to register widely cultivated extant and farmers' varieties to establish a protected commons³⁴, which would facilitate farmers' continued accessible use whilst excluding potentially exploitative parties.

According to the Indian PVPFR law, "farmers' varieties" are a subset within the definition of "extant varieties" but may also mean a variety which has "been traditionally cultivated and evolved by the farmers in their fields; or... is a wild relative or land race of a variety about which the farmers possess the common knowledge" (Art. 2L). These may be protected in a nearly identical manner to extant varieties under the Act. The approach of this component of the law is to allow equal treatment and allocation of rights to each kind of plant variety (farmers' variety, extant variety and new variety), and to all types of plant breeder (from local farmer to advanced breeder). It remains to be seen whether or not the system of registration is too formal for farmers; if it will be misused by parties seeking to exclude others; or whether it will cause an anticommons tragedy.

The PVPFR Authority and the M.S. Swaminathan Research Foundation (MSSRF) organised a recent multi-stakeholder meeting (Koraput Declaration, November, 2006) to address the registration of farmers' and extant varieties.³⁵ The meeting

encouraged the development of guidelines for implementation of these provisions, including that:

- *Care should be taken to make a distinction among germplasm, landraces and farmers' varieties;*
 - *Extant varieties, whether from professional plant breeding institutions or from farm families, shall be treated alike in the matter of registration, i.e., they should satisfy the DUS (Distinctness, Uniformity and Stability) requirements;*
 - *Registration of extant varieties may be limited to those satisfying any one or more of the following conditions:*
 1. *Varieties having known distinctness in one or more important biotic or abiotic attributes.*
 2. *Varieties having widely known and acceptable economic attributes other than biotic/abiotic resistance, such as nutritional quality in cereal, staple length in cotton, sugar content and recovery in sugarcane etc.*
 3. *Varieties possessing very unique characteristics, which are uncommon in crop germplasm, such as a medicinal rice variety, etc.*
 4. *Varieties known for high adaptability to certain specific ecosystems or growing conditions such as SR-26 B and Pokkali rices, Saathi Maize, Kharchia Wheat, Basmati 370 rice, Bikaneri Nerma cotton variety etc.*³⁶
- (PVPFR Authority and MSSRF, 2006).

Subsequently, the Ministry of Agriculture passed the PVPFR Regulations on 7th December 2006. The rules detail the extensive duties of the Registrar for examination of applications (Art. 3 PVPFR Regs.); criteria for registration of extant (and assumedly farmers') varieties (Art. 6 PVPFR Regs.), which are overseen by an Extant Variety Recommendation Committee³⁷ to whom discretion falls over DUS criteria; and other administrative matters. The PVPFR Regulations append application forms, including a section requiring details on the use of farmers' varieties or varieties of common knowledge used in the parental line for propagation of the hybrid. These include requirements for details of: denomination, geographical source, details of attribution (origin) and details of farmer/village community/ institution/ organisation (PVPFR Regs. Form 1. Part 10b.). These origin requirements are quite detailed and may be burdensome for some breeders. The form also asks what sort of recognition (including benefit sharing) is planned for farmers/communities, in cases where these groups have conserved the genetic resource that has contributed towards variety development (PVPFR Regs. Form 1. Part 10c.). It is too soon to tell how effective and practical these rules are. Policy-makers from other countries should monitor the experience of authorities and stakeholders in India as registrations are submitted and these rules begin to have tangible effects.

Another issue to consider from the Indian case is that domestic varieties may not be entirely *uniform*. In this case, the Extant Variety Recommendation Committee may have to be fairly lenient in making decisions over the uniformity requirements of applications. Instead of applying lenience to the stability requirement, Leskien and Flitner (1997) suggest that a requirement of distinctness and *identifiability* may be a more useful and flexible generic criterion for visual or measured sub-taxonomic plant characteristic identification.³⁸ In other words, each generation of the plant variety must be identifiable as the same distinct plant variety, without necessarily being uniform in all of its characteristics. The Malaysian PVP law (S.14.2) allows for protection of plant varieties bred or discovered and developed by a farmer, local community or indigenous people, subject to criteria of being “new, distinct and identifiable” – a particularly useful way of making the distinction between these more heterogeneous varieties.³⁹ The Thai PVP law has DUS requirements for general domestic varieties and local varieties, but excludes wild varieties from these characteristic requirements (S.11).

Alternatively, the Thai PVP law separates new varieties from domestic⁴⁰ (extant) and wild, and from local varieties, so as to give categories for differential protection. Also, the Thai PVP law does not allow exclusive rights claims over domestic or wild varieties. A range of Thai farmers’ organisation representatives, prominent NGO activists, academics and even government officials⁴¹ indicated in interviews that one of their main concerns about the expansion of the IP system into agriculture (and biological diversity more generally) was that it allows for exclusive control of biological materials. Exclusive control of plant varieties (and their replicability) contradicts past customary practices, as well as cultural and ideological beliefs. Therefore the Thai PVP Act instead requires permission and profit sharing arrangements in exchange for access to and research into the varieties for *commercial interests*.⁴² A range of stipulations must be made, including the intentions of those seeking access with regards to IP rights. This should allow the continued and free use of the variety by farmers, and seeks to provide them with benefits via a PVP Fund if the germplasm is commercialised. Currently the law requires permission to be granted by government officials for collection, use, research or commercial interest,⁴³ but countries who utilise this sort of approach could consider extending it to include the consent of farmers groups. This could be put into operation in the near future, but has been stalled by the “existing” PVP provisions (discussed below) and because of cross-department harmonisation with the Act on the Promotion and Protection of Thai Traditional Medicinal Intelligence (1999).

Despite these measures, it is important to note the historical interdependence of countries in the supply of agricultural plant varieties. As Falcon and Fowler (2002:198) note, “no nation has ever fabricated or maintained a prosperous

food system based on genetic resources of purely indigenous origin". Therefore, in seeking to continue to foster this interdependence, national breeding programmes should not only focus on domestic varieties.

In some cases, countries may wish to allow protection for domestic or extant plant varieties which have a foreign source of origin, that have been introduced to the country, but have been bred and adapted to domestic conditions. The Indian and Thai PVP laws allow "existing" plant variety protection which may also include varieties originating elsewhere that have been "indigenised".⁴⁴ However, if varieties have only recently been introduced to a country, this form of protection could potentially cause protest from the country of origin, and seems to undermine the idea of crop germplasm interdependence. Therefore it is recommended that indigenised plants, if they truly have been adapted to new environmental conditions, should exhibit some novel characteristics to qualify for extant variety protection. It may also be important to require that the introduced variety has a considerable history of use in the country (e.g. ten years or more) that can be demonstrated by the breeder applicant. Otherwise, where registration requirements are already too burdensome on authorities, they might want to reject this "existing" variety component of domestic variety protection altogether. In Thailand, if this does cause further stalling of implementation, the term should be removed from the text.

Summary: *sui generis* elements specifying domestic or extant PVP may include:

- The conferral of exclusive extant variety and farmers' variety protection similar to new plant variety protection. This approach presents a more complex system that will require a greater commitment by PVP staff, breeders, and communities, whilst still presenting a range of potential problems (e.g. legitimate authority to register extant varieties, discouragement of traditional seed exchange, and potential "anti-commons issues"). It is probably not recommended for countries wishing to avoid a complex and substantial administrative burden (involving considerable establishment of authorities and committees in local government and provincial government, which has been complemented in India by their Biological Diversity Act), including, in particular, least developed countries in the region with limited administrative capacities;
- Instead of utilising DUS criteria, it may be useful to simplify the criteria to allow for extant variety heterogeneity (e.g. having an identifiability requirement). This recommendation could apply to any country, particularly where they have persistent *traditional* breeding practices;
- Alternatively the law could follow a liability regime approach, containing provisions explicitly declaring that permission must be obtained to access, use and research domestic varieties for commercial purposes, with subsequent benefit sharing required. Benefit sharing arrangements could operate through a Gene Fund which could then be accessed by

farmers or establish beneficial projects. This represents a system of lesser administrative burden and could probably be more successfully implemented by least developed countries in the region than the Indian model;⁴⁵

- Protection for domestic varieties that have been historically introduced and “indigenised” can be achieved via either of the above options. However, it may be appropriate to specify that the variety must have a history of a considerable time period, and that the variety displays some novel characteristics that indicate it has been adapted to domestic conditions. Otherwise this sort of provision should simply be scrapped.

3.4 Local Plant Variety Protection

Some local plant varieties originate and exist only in specific geographic areas. These are typically farmers’ varieties and may have been developed from undomesticated or wild species, or they may have only limited distributions for environmental reasons.⁴⁶ In other cases the varieties simply may not have been distributed more broadly due to market preferences. The objectives of local PVP provisions are to allow *community protections* over a variety, recognising the contribution of farmers and communities to plant breeding activities. However, the provisions may also be intended to broaden the market of such varieties beyond a local area; to recognise the local quality of these plant varieties; or they may be used defensively to exclude others because the variety has cultural or spiritual significance to a certain group.

The Thai PVP Act allows registration of local plant varieties (Ch. IV) by a community which must provide a precisely delimited area and map showing where the variety exists, a breeding history, as well as a list of the members of the community. The community may also be registered as a farmers’ group or cooperative. The precise definition and registration of the community and variety is required in order to avoid conflict between local and trans-local individuals.⁴⁷ Although there have been some concerns that the requirements may be burdensome for local farming communities, the provisions have generally been well received by most stakeholders and interested parties.

In Thailand, local variety protections have arisen through campaigns by local farmers’ networks and NGOs. Today local plant varieties still exist, one example being a Karen Local Rice Variety, cultivated by Karen communities in a confined area of Western Thailand near Mae Sot in Tak Province. Even the famous Jasmine Rice (of which the most prominent variety is Khao Dok Mali 105), was reputedly found originally in *local areas* of Chonburi Province, just South-East of Bangkok, before being spread to the next province north (Chachoengsao) for cultivation about 50 years ago. Due to its pleasant aroma and edible qualities, the variety

was spread to the northeast (Issan) region where conditions on the Khorat Plateau are ideal and the plant is now extensively cultivated. Despite now being a general domestic variety, Khao Dok Mali 105 has local origins.

The community which registers the local variety gains an exclusive right over its development, study, research, sale, export, and production.⁴⁸ Exceptions are made for use for non-propagating purposes, acts committed in good faith, and non-commercial uses. If the variety is sought for development, education or research, a profit-sharing agreement must be made, and approval must be granted by the PVP Commission and the local community or farmers' group. If commercialised, profit sharing is scheduled such that twenty percent goes to the farmers who conserve the variety, sixty percent to the community as common revenue, and twenty percent to the local government authority or farmers' cooperative through which the variety is registered and administered (S.49). Although generally supportive of the provisions, some NGOs and academics⁴⁹ have questioned this division of profits because it may cause conflict between the stakeholders.

Although the regulations administering this section of the Thai PVP Act have not yet been implemented, it provides an interesting example of issues related to the protection of community interests. Namely, it attempts to define a community in practical terms; gives an insight into the problems of fairly and equitably distributing profits arising from local/farmers' variety commercialisation; and raises questions about the representation and leadership of communities through farmers co-operatives or local administrative bodies. Notably, local PVP may function under these provisions more effectively, precisely because in this case there is a single origin. Where domestic farmers' varieties have broader distributions, the administration of rights particularly relating to profit sharing becomes much more complicated.

In other cases, such as in the Indonesian PVP Act, the government asserts controlling authority over local plant varieties through PVP. In these circumstances the government may be seeking to exclude outside misappropriation. However, excessive government control may be protested by the local community which has developed these plants. This sort of provision is justified by the principle of sovereign control, but could go against ITPGRFA principles of farmers' rights and the effort in the CBD Bonn Guidelines to extend control of biological resources to local farmers and communities. In order to meet these principles, the state authority over local plant varieties could specify that it will obtain PIC and share benefits with local communities if their varieties are sought for research and commercialisation.

Although it is beyond the scope of this paper to explore the concept in detail, it may be beneficial to have a corresponding system for the geographical

indications protection, appellation of origin, or certification trademarks of regional or local plant varieties.⁵⁰ These might be possible if it is recognised that there are specific qualities of the plant variety which are distinct to the region/locality, and which might involve traditional knowledge or practices which add to its qualities. Corresponding labelling provisions could help express and protect the name, origin and quality of the product. However, in the WTO TRIPS Council, there has been conflict over the extension of geographical indication controls to products other than wines and spirits. This matter remains unresolved.

Summary: *sui generis* elements for local PVP could include:

- The ability to register plant varieties which exist only in specific geographical areas. Registration could be made by a discreet community, or with association with a farmers' group or co-operative allowing communities to gain exclusive or other rights. They may do this for defensive reasons, for recognition, or to promote the variety to broader markets and reap potential benefits;
- Alternatively, where the government explicitly states that it retains ownership and control over local plant varieties, it should develop regulations that require PIC of the communities where the variety was sourced, and share any benefits accrued from research and commercialisation;
- Additionally, countries may wish to establish systems of geographical indications or related protections for local or regionally unique varieties.

3.5 Wild Plant Variety Protection

Wild relatives of plant varieties are understood to be undomesticated general varieties or land races which may be widely known by local farmers or authorities.⁵¹ Often these actually refer to wild *species, sub-species and lesser groupings* of plants from which new or domestic/extant varieties are sometimes developed. The characterisation of these plants as wild *varieties* depends upon different interpretations of the definition. In other words, because they do not necessarily conform to DUS standards, some would argue that they cannot be called "varieties" – they may not be entirely stable or uniform. Thus, land races or wild varieties may only be identifiable from other wild varieties of the same species given a less strict view of plant variety identifiability criterion.

Generally these plants are not currently cultivated because they present undesirable traits which may mean low yields, poor quality as a food crop, poor pest tolerance or other limiting factors. However, this does not mean that these plants are useless, and they may be used in other ways by local farmers. They can play important roles within their surrounding ecosystems and contribute to

genetic diversity. They may exhibit other traits which are desirable or which are not yet known. Wild varieties may also be useful for cross-breeding with other varieties, to aid their development and adaptation to different conditions.

Some might question the need to protect wild varieties beyond efforts to save their germplasm in *ex situ* genebanks. But there is evidence that local communities' TK of wild varieties has assisted in the chain of R&D of useful plant genes. Gupta documents the scientific discovery of a disease resistant gene in a wild rice variety *Oryza longistaminata*, which originated in Mali. This wild rice variety was known and used by a number of different groups – local Malians and immigrant Bela people – but was regarded and used in very different ways. Generally speaking, it was not a good staple crop plant, and in some cases it was even regarded as a weed. After passing through the hands of a range of research bodies, the plant was researched and the disease resistant gene isolated. With subsequent developments in international law, such as the TRIPS Agreement and the CBD, the rice came to be the source of a complex benefit sharing controversy. In response, a retrospective benefit sharing arrangement has been developed, but even this has seen limited gains for the local community.⁵² Situations such as this argue the case for countries to recognise and protect their wild plant varieties. Local communities and authorities may ultimately accrue further benefits from such provisions.

Thailand is the only country in Asia which explicitly provides for protection of wild varieties in its PVP law, although it is also implied as a subset of India's definition of "farmers' variety". The protection offered to wild varieties is equal to that offered to domestic varieties in the Thai law, and similarly the Indian law offers the same protection for "farmers' varieties" as it does for extant varieties, as previously discussed. Again, because wild varieties are often the subject of broad distribution or public domain knowledge, it may be difficult to distribute profits directly to local custodians (if they exist). In other cases it may be possible to identify their origins, such as in the *Oryza longistaminata* case.⁵³ In practice, benefit sharing may occur only rarely, where the wild variety has desirable attributes for use in cropping or for research and commercially viable development.

The extension of protections to general and wild varieties in the Thai case, and to extant and farmers' varieties (including wild varieties) in the Indian case, are intended to capture all plant varieties within their sovereign domains. This is clearly in adherence to the CBD, and in response to domestic concerns about the misappropriation of genetic resources. Other countries with similar concerns about their sovereign control of plant varieties may also wish to establish the same cover-all protections, including for general domestic and wild varieties.

Countries may wish to establish controls which conserve local, wild and domestic varieties both *in situ* and *ex situ*. Wild and local varieties may be particularly threatened because they remain uncultivated, or are only cultivated in limited areas. Threats include land clearing, expansion of generic crop varieties and monocultures, population pressure, urbanisation, desertification, over-cultivation, loss of arable land, and other related factors. The establishment of gene funds which pool profits from research on plant varieties are only one part of the solution.

Additionally, governments may wish to provide incentives for on-farm diversification using local and wild varieties. The encouragement and government support of traditional seed exchange networks (which are still prevalent in many Asian countries such as India, the Philippines and Thailand) could help facilitate further development of local and wild varieties for adaptation, improvement and development of desired qualities and tastes. Research institutes and training centres which encourage or teach utilisation of traditional on-farm approaches and knowledge, such as seed selection and improvement, but which also bridge informal-formal systems (e.g. SRISTI, India and Khao Khwan Rice Research Institute, Thailand), could also be developed and supported.

In situ conservation may be encouraged by setting aside protected areas or by having co-managed areas (such as community agro-forestry areas) which reflect different ecologies of traditional human-plant interactions. The Indian Biological Diversity Conservation Act 2002 (Ch. X) establishes Biodiversity Management Committees (BMCs) in local administrative bodies across the country. They are charged with developing conservation plans for local biodiversity, including land races and folk varieties, and are also responsible for the “chronicling of knowledge relating to biological diversity” in their local areas (discussed further in Section 3.11.).

Summary: *sui generis* elements for wild PVP could include:

- Non-exclusive protection consisting of requirements for PIC and benefit-sharing arrangements with relevant government officials and TK holders (where they exist and can be identified). If the distribution of the wild plant variety is broad and is in the public domain, a gene fund could provide benefits or establish beneficial projects for farmers who use or conserve the varieties;
- Wild plant varieties (as well as local varieties) may need additional *in situ* and *ex situ* conservation controls. These could be part of a PVP law or could be in a separate law which has corresponding jurisdictional control (i.e. a plant or seed quality law/authority; a biodiversity law/authority). Controls and incentives could include: on-farm diversification incentives; encouragement and support of seed exchange networks; support for

grass-roots research and training institutes; in situ conservation areas; co-managed agro-forestry areas; and local conservation initiatives that include documentation of TK.

3.6 Access and Benefit Sharing

Access and benefit sharing is really two concepts which have been discursively placed together in CBD settings. Accessing plants, genetic materials and associated knowledge of their uses was historically quite uncontroversial. It has now become problematic because of concerns surrounding research, commercialisation and exclusive IP control over plant genetic resources. As a consequence, a range of methods have emerged which formalise the transaction or exchange of plant germplasm and traditional knowledge. Benefit sharing has subsequently been envisaged as a means for compensating and encouraging plant germplasm exchange.

Although countries are encouraged to facilitate access to plant genetic resources by the CBD and the ITPGRFA, there are often conflicting desires about the regulation of access. Some groups may want to limit the potential for genetic resource extraction, commercialisation and IP control; and others may want to facilitate access to certain genetic resources in order to use and research them, with potential for further development and commercialisation. The likelihood of a transaction has very much to do with the terms of agreement, and also the parties involved.

The Indian Biological Diversity Act (2002) is worth considering here. Because the primary concern of the Indian Government and the Indian public was deemed to be the extraction of biological resources for R&D outside the sovereign domains of the state, the law has different access requirements for foreigners and Indian nationals. Accordingly, foreigners are faced with a more complex procedure for access to biological resources than Indians.⁵⁴ Sagar (2005) notes that this state-based bias means that local genetic resources could be exploited by Indian researchers, but local farmers or tribal groups may not be adequately consulted or receive consequent benefits. Thus, while differential treatment for foreign nationals might protect sovereign rights over biological resources, it does not guarantee respect for the local custodianship of resources.

Regulating access to *in situ* plant materials also requires consideration of their distribution. Where agricultural plant varieties have limited distribution, namely local plant varieties, they may be easier to control and regulate. In cases where they are broadly distributed, such as new, domestic or wild plant varieties, it may be much more difficult. The location where the plant varieties can be found will also affect access control. If plant varieties only exist in protected areas, or

where clear property rights are allocated, then access might be more tightly controlled. If plant varieties are available in open areas, in places where property rights are unclear, for sale in markets and generally in the public domain, then they will be easily accessible. In order to restrict the pilfering of widely accessible public domain plant varieties, the drafters of *sui generis* laws might want to specifically indicate that these varieties fall under the control of a state authority (e.g. a biodiversity or plant variety authority) which must be consulted for access and collections in the process of research, development or commercialisation.

Because genetic materials are replicable and mobile, they can be easily collected and transported out of state jurisdictional controls by unauthorized parties. Efforts to restrict these practices require a range of approaches. These could include protected area measures for rare varieties,⁵⁵ registration required for the sale of plant varieties and products in markets or nurseries,⁵⁶ as well as border control measures such as customs inspections. Some countries with more advanced economies, such as Australia and New Zealand, can afford to employ highly stringent customs and quarantine services at their ports for the protection of domestic biodiversity. Strict customs controls can limit the extraction of genetic materials and provides greater certainty that sovereignty over the materials can be maintained. However, this is an expensive process. While mention of these approaches could be included in a *sui generis* law, it should preferably designate controls to biodiversity and customs authorities and laws.

Another problem emerges in relation to the subject matter – plant varieties and genetic resources. Where species are concerned, taxonomists can usually quickly differentiate between plants, whereas plant varieties, which categorically occur below sub-species, may be much harder to classify. There is a UPOV classification and testing system which uses visual and measured methods for identification of characteristics, yet even this can be subjective. Analytical procedures using DNA fingerprinting have been developed in recent decades and can more accurately determine the genetic relationships between different plant varieties. Nevertheless, any of these methods can present quite laborious procedures for plant variety differentiation. Therefore the investigation of potential disputes arising from misappropriations⁵⁷, and the tracing of the origins of biological or genetic materials, may be burdensome on authorities already stretched to register new (and potentially domestic, local and wild) varieties. Education and clear designation of authority and access rules could further ensure researchers act lawfully and in good faith. In fact, the CBD requires parties to clearly designate relevant biodiversity-related authorities in order to facilitate access to genetic resources. Lawful access is now usually granted through MTA and PIC procedures, which are discussed in detail in the following section.

Traditional knowledge appears to be an even more mobile entity than genetic resources. Regulating access to TK is highly problematic and requires special consideration. Access regulations for genetic resources and plant varieties could specify that they also relate to “associated TK”. The section below on TK protection and promotion considers this at length.

Benefit sharing has already been raised in a number of previous sections of this paper. The concept emerged from a perceived need for bioprospecting activities and genetic resource transfers to be fairer and more equitable; with the assumption that return profit (or other benefit) flows might encourage ongoing conservation and sustainable use of genetic resources by both national authorities and local communities.

A number of case studies on benefit sharing arrangements have found that only rarely have true “benefits” been reaped by provider parties, that the transfer, contract and conditions have been controversial, and that there is now an increasing trend away from sourcing biological materials from *in situ* or “indigenous” sources.⁵⁸ Some cases include:

- the Costa Rica InBio non-profit, non-government bioprospecting activities which have been controversial for having failed to provide benefits to local farmers and indigenous groups;⁵⁹
- the failed bioprospecting venture of Shaman Pharmaceuticals Inc, which intended to identify traditional medicines, isolate active compounds and commercialise the product whilst also sharing a portion of the benefits;⁶⁰
- the *Oryza longistaminata* gene patent and benefit sharing arrangement;⁶¹
- the development of the “Jeevaani” drug from the Kani medicinal plant *ayogyapaacha* in India, which could have had broader benefits and involved more TK holders, amongst other issues;⁶²
- a Riche Monde philanthropic project to document the TK of the Karen people in northern Thailand which failed due to a lack of trust and public skepticism as to their motives;⁶³
- The *Hoodia* case involving the San people and the Council for Scientific and Industrial Research of South Africa, in which a failure to obtain PIC initially led to further problems of benefit sharing and San exclusion from deal-making, with subsequent difficulties in providing benefits to different communities.⁶⁴

It is therefore easy to be cynical about the practicalities and reality of benefit sharing, especially where the knowledge of diverse local communities and farmers groups are involved. Nevertheless, many would agree that with more experiences and clearer regulatory frameworks, benefit sharing agreements may increasingly become effective and useful. There are some cases where benefit sharing agreements have reportedly been quite successful, for example, in the

Andean Potato Park in Peru, involving Quechua communities and the International Potato Centre gene bank. The arrangement has established reciprocal access to genetic resources, and benefit sharing on the basis of Andean customary laws of reciprocity.⁶⁵

With regards to plant varieties and related TK, benefit sharing is often facilitated through a “gene fund” or “plant varieties fund”. These may distribute funds to farmers directly (where it is practicable) or provide other benefits to them by establishing useful projects, research or incentives (see section 3.10). Such funds may gain income from the registration of plant varieties domestically; through payments for access to plant varieties, genetic resources and associated TK either by domestic or foreign researchers; or from other sources.

In the case of non-agricultural biological resources, such as medicinal herbs or forest resources, corresponding funds may be set up by competent biodiversity, traditional medicines or forest authorities. In India, between the Biological Diversity Act and the PVPFR Act there is some overlap with regards to agrobiodiversity. The authorities administering both laws have jurisdiction over benefit sharing, whilst only the PVPFR Authority has control over the grant of IP rights.⁶⁶ In each country it is important that the regulatory bodies are held to be transparent and accountable for the distribution of funds, and that the committee or board which oversees the fund has fair participation from a full range of stakeholders (i.e. farmers, government, industry, academia, gender equality and indigenous or minority group representation where appropriate).⁶⁷

The CBD Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization provide detailed guidelines as to the steps and procedures involved in benefit sharing. Importantly, the first step is to gain authorized access by obtaining PIC, an MTA, or both – whichever is relevant to the circumstances. Such arrangements are to be made under mutually agreed terms, to ensure a fair negotiation. Parties typically include the researchers involved and the relevant national authority, but should also include provider communities or farmers’ groups where they have made some contribution.

Parties might agree on monetary benefits in the form of royalty payments, access fees, the payment of salaries where employment is created, research funding and joint ownership of IPRs.⁶⁸ Despite a tendency to focus on monetary benefits, in some cases it may be preferable to distribute other kinds of appropriate non-monetary benefits.⁶⁹ These might include the sharing of R&D results, participation in the research project, training, food and contributions to livelihood security, human resources and employment, transfer of appropriate technologies, establishment of biological resource conservation projects, development of TK databases, the foundation of cultural information centres to

provide information about traditional knowledge, practices and customs, and shared or yielded ownership of IPRs.

Parties will no doubt need to negotiate the timing of benefits (i.e. in immediate, milestone or royalty installments); the distribution of benefits to relevant parties subject to practicability; and the mechanism for benefit sharing (e.g. through individuals, a fund, establishment of a project or centre, employment or training contract, and others). These will vary considerably on a case-by-case basis.

Summary: *sui generis* elements for regulating access could include:

- Prior informed consent and/or material transfer agreements (see the following section);
- Clear access point and designation of national authorities over the jurisdiction of access to biodiversity, including agricultural plant varieties, medicinal plant varieties, forests and protected areas, plant varieties in other public domain areas, and related TK. A national focal point or licencing body could help facilitate access by providing a single access point, which could then coordinate with other designated authorities;
- The establishment of cultivation limits and protected areas for rare, threatened or overexploited varieties;
- Clear identification of the role of customs authorities in restricting unauthorized collection and international transfer of plant materials.

Summary: *sui generis* elements for benefit sharing could include:

- Establishment of gene funds for the distribution of funds, or expenditure on useful projects or incentives;
- Means for the collection of funding from numerous sources such as: royalty payments, plant variety registration fees, plant or gene (and associated TK) accession fees, government contributions, and other sources;
- Ensuring fair participation of relevant stakeholders in benefit sharing fund committees or boards;
- Ensuring fair participation of all relevant parties, including traditional local communities and farmers, in the negotiation of ABS arrangements;
- Conditions for mutually agreed terms as specified in the Bonn Guidelines;
- Stipulation and examples of the kind of monetary and non-monetary benefits that may be allocated as appropriate and desired;
- Stipulation and examples of the timing of benefits, the distribution of benefits between parties, and mechanisms for benefit sharing.

3.7 Prior Informed Consent and Material Transfer Agreements

Prior informed consent is a CBD principle which is largely self-explanatory, but also detailed at length in the Bonn Guidelines. It may represent a simple process and contract, or it may involve a more detailed and prolonged negotiation.

Those seeking access should initiate PIC procedures with the relevant competent national authority (which should be clearly identifiable). It may also be required of different levels of government, provincial or local, as well as from traditional local and farming communities, especially where *in situ* materials and TK are involved, or where *ex situ* materials have clearly traceable sources of origin. It should be sought with sufficient warning for all parties to consider the application for access.

A PIC system established at the national level should include as a minimum:

1. An access point acting as, or directing to, competent authorities that can grant PIC;
2. Timing and deadlines such that consent is sought sufficiently in advance of access, and to ensure quick processing of applications;
3. Specification of use requirements, such that authorities may consider the validity and necessity of access, and any problems or offence it might cause;
4. Detailed procedures for PIC (detailed below);
5. Mechanisms to facilitate consultation with relevant stakeholders;
6. Transparent processes, including documentation and permits, licences or similar.

(adapted from the Bonn Guidelines, 2002, Part IV)

In the process of obtaining PIC, sufficient information must be provided to the provider party regarding the legal entity/person seeking access, the resources (and associated knowledge where sought), the intended uses of the genetic resources (e.g. education, herbarium storage, research, development, potential commercialisation), intellectual property rights, benefit sharing, project budget and confidentiality, amongst other things. A list of PIC procedures that might comprise the template of an application form for access could include:

- (a) Legal entity and affiliation of the applicant and/or collector and contact person when the applicant is an institution;*
- (b) Type and quantity of genetic resources to which access is sought;*
- (c) Starting date and duration of the activity;*
- (d) Geographical prospecting area;*
- (e) Evaluation of how the access activity may impact on conservation and sustainable use of biodiversity, to determine the relative costs and benefits of granting access;*

- (f) *Accurate information regarding intended use (e.g. taxonomy, collection, research, commercialisation);*
- (g) *Identification of where the research and development will take place;*
- (h) *Information on how the R&D is to be carried out;*
- (i) *Identification of local bodies for collaboration in R&D;*
- (j) *Possible third party involvement;*
- (k) *Purpose of the collection, research and expected results;*
- (l) *Kinds/types of benefits that could come from obtaining access to the resource, including benefits from derivatives and products arising from the commercial and other utilization of the genetic resource;*
- (m) *Indication of benefit-sharing arrangements;*
- (n) *Budget;*
- (o) *Treatment of confidential information.*

(Bonn Guidelines, 2002, Part IV.C. p11)

Notably, permission to access genetic resources does not necessarily confer access to knowledge associated with those resources. National authorities need to clearly specify distinctions between access to resources and associated knowledge of their uses, particularly where local communities and traditional farming groups are involved.

Whilst dealing with these access and consent activities might be a fairly routine matter for government officials, the whole process could be invasive for the traditional local or farming communities involved, and therefore culturally sensitive approaches and respect for local customs should be observed. A potential *sui generis* law could detail a range of these specific requirements, such as who has authority to provide or deny consent, as well as respect for customary protocols where PIC involves local communities. The Bonn Guidelines also extensively detail basic requirements for mutually agreed terms between parties (Part IV.D).

Some PIC procedures have been criticised for creating a complex process of access. Indeed, some countries that are defensive of their sovereign control over biological resources may be happy to leave the process in a complex state for protective reasons. In most circumstances, however, there are benefits to be drawn from the establishment of transparent and easy-to-use PIC procedures at the national level. These could include the potential receipt of benefits, research collaborations, and the development of useful products. Therefore national authorities need to carefully consider the different aspects of an effective PIC system.

Material transfer agreements are increasingly the norm for agricultural germplasm transfer, but may also be used in cases where other biological materials are transferred. As part of its Multilateral System, the ITPGRFA has

developed a standardised MTA for access to IARC gene banks and to the gene banks of state Parties to the Treaty. The Standard MTA also contains stipulations regarding the disclosure of the passport data and descriptive information (Standard MTA, Art. 5b) and other rights and obligations for providers (Art. 5); rights and obligations of the recipient including limitations on use only for research, breeding and training purposes for food and agriculture (Art. 6.1); and restrictions on the claim of IP or other rights that would limit the future facilitated access to the materials (Art. 6.2). Benefit sharing is established upon commercialisation of products which utilise or incorporate the material that has been transferred (as discussed in Section 1.2). The distribution of these benefits is subject to the decisions of the Governing Body of the ITPGRFA.

An MTA is generally, but not always, limited to the transfer of *ex situ* materials. Where *in situ* materials are sought and where TK is involved in the R&D of a product, the negotiation of a fair and equitable MTA which recognises these inputs may raise complex debates.

Material transfer agreements also represent a streamlined transfer process that recognises the interdependence of biological resources (especially in agriculture). Biodiversity which has potential medicinal qualities may have a more finite distribution because it does not have the same history of interdependence, trade and international institutional setting as established crops, and because medicines are often based on singular active compounds. Therefore medicinal plant variety sovereignty is a more likely consequence than agricultural resource sovereignty.⁷⁰ In countries with strong continuance of traditional medicinal practices and those with a significant conceptual overlap between food and medicines (including countries like China, India and Thailand) certain groups may be wary of the implications of MTAs and the Multilateral System, at least until it is tested over a longer period of time.

However, this does not mean the MTA concept is incompatible with CBD principles for PIC and benefit sharing – MTAs also reflect a consent contract and should stipulate benefit sharing arising upon the commercialisation of products derived from accessed plant materials. The Bonn Guidelines indicate that the development of standardised MTAs may be useful for similar biological resources (e.g. for the transfer of a specified list of crops, as is the case for the ITPGRFA) and similar uses, and provides suggested elements. These elements may go beyond the requirements of the ITPGRFA standardised MTA if a country decides to. State bodies will need to reconcile MTA and CBD concepts between agriculture and biodiversity authorities: CBD principles of benefit sharing and PIC could be housed as requirements within MTA contracts for a streamlined process; or MTAs, if used, might be seen as just one formality amongst a range of negotiations of PIC, access and benefit sharing, and other rules.

Summary: *sui generis* elements for PIC and/or MTAs could include:

- Clarification of the legal standards employed for the fulfilment of PIC requirements. This should include, within PIC mechanisms, clear designation of the national authority providing consent, consent procedures for local communities and farmers where appropriate, and sufficient advance warning for the grant of access;
- Detailed information requirements for PIC, such as identity of the legal entity/person seeking access, intended uses, IPRs, benefit sharing, etc. and basic requirements for mutually agreed terms;
- Mutual transfer agreements could be adopted within the law or regulations as a formal contract for the streamlined transfer of agricultural genetic materials, particularly when extracted from *ex situ* sources.

3.8 Promoting Domestic and Local Plant Innovations

Benefit sharing is viewed as a way of potentially promoting the conservation and use of a diverse range of plant varieties. However, until recently it has generally been utilised as a retrospective measure of compensation. If countries developed a critical mass of benefit sharing agreements, the net effect could filter through national gene funds to conserve and sustain domestic and local varieties. However, the likelihood of this happening in the immediate future remains slim due to the politicisation of the issues, and the difficulties countries have had in implementing ABS regulations.

In order to facilitate benefit sharing, new initiatives could be developed to promote domestic, local and wild varieties. Governments may wish to provide incentives such as low-interest loans, tax breaks, marketing and labelling schemes which identify quality local products. For example, the “One Tambon One Product” (OTOP) initiative in Thailand encourages local small- and medium-sized enterprises to develop local products at the Tambon (local government area) scale for domestic sale and export. The OTOP initiative provides incentives to small-scale entrepreneurs, and a marketing base which includes labelling to recognise the local geographical area of origin. This initiative is increasingly being used to promote local food, herbs and medicinal products.

But crop interdependence must be recognised as well, and the breeding programmes and farmers should of course continue to adapt foreign plant varieties to their own conditions where environmentally appropriate. As Barton (2007) notes, the national agricultural research programmes in China and India, as well as in Thailand and other smaller nations, have continued to expand in comparison to CGIAR centres. He suggests that this change may allow the CGIAR institutions to concentrate on the earlier phases of crop development,

and then to turn varieties over to national programmes for final breeding and improvement for the particular nation's agronomic conditions.

The importance of seed exchange networks for ongoing conservation and development of foreign, domestic, local and wild plant varieties cannot be overstated. Seed exchange networks are prominent in many Asian countries. Governments could provide additional support for such networks to allow them to innovate, trade and adapt plant varieties through traditional means. The funding of grass-roots research and training institutes (such as SRISTI, Navdanya and Khao Khwan) could help link both formal national bodies of breeding and variety development, and informal local systems of seed exchange and development.

Additionally, the government, independent authorities, and even academic projects, might seek to establish a "protected commons". A plant varieties' protected commons system, whereby domestic varieties are registered and protected by an independent government or non-government body, could be a way of encouraging innovation and protecting domestic genetic materials. These would be freely available for use under contract but would exclude patenting or PVP except by the organisation itself. This, in theory, assures that the material would stay freely available, but may be innovated and improved upon by others. In Australia, CAMBIA has established such a system which seeks to develop a "biological materials open source" network, although in this case through patent protection.⁷¹ However, the reality of such a concept is that the complexity of the licencing system may make it impractical for all but the most advanced biological technologies – a hindrance that the CAMBIA project indeed seems to have encountered. Attempting such an initiative in most Asian countries would likely be received with considerable distrust, at least until it could effectively establish its operations. Many farmers' groups and local communities could be initially concerned about the exclusive protection and complexity such a system would involve, even if its intentions is to establish a free commons.

Governments could also promote niche markets and target consumers. For example, under the (now deposed) Thaksin government (and retained under the current interim government), the Thai Department of Agriculture has placed a top priority on encouraging farmers to take up organic agriculture. The intention is to exploit potential niche export markets of health-conscious consumers. Similar niche markets could be created and exploited domestically and overseas through a range of carefully targeted measures, including incentives, quality control, branding, labelling, and marketing. While well-known and researched varieties will be more likely candidates, there is an increasing market projected for agricultural products which can claim unique qualities, "exotic" origins, organic status, or which can prove they support local

communities or crop genetic diversity. The Fair Trade movement, and “locally-sourced” initiatives through organisations such as Oxfam, suggest emerging international niche markets answering to socially and environmentally conscious consumers.

Summary: *sui generis* elements for the promotion of domestic and local plant innovations could include:

- Incentive mechanisms for small-scale enterprises;
- Encouragement and support for seed exchange networks;
- Encouragement and support for grass-roots research and training institutes which could help link formal, national and public breeding bodies with informal seed networks;
- The potential establishment of projects which try to create open source models for biological materials, such as a “protected commons” situation;
- The promotion of niche markets and campaigns targeting specific consumer groups.

3.9 Addressing Farmers’ Rights Concerns

Farmers’ rights concerns typically encompass the ability of farmers to save, use, exchange and sell farm-saved seeds and/or propagating material. The ITPGRFA reminds us that the protection of agricultural traditional knowledge, and participation in policy-making and decision-making, are also key concerns for farmers.

The Indian PVPFR Act explicitly provides for farmers’ rights. These include the ability to save, use, sow, resow, exchange, share, or sell their farm-saved seed, and the prospect of rewards from a National Gene Fund. It also accords rights to communities to receive compensation if the community is found to have made a significant contribution to the evolution of a protected variety – essentially recognition of the contribution of TK which the ITPGRFA also includes as a farmers’ right. Other laws, such as the Thai PVP Act, also respect the traditional knowledge of farmers through their benefit-sharing provisions for domestic, local and wild varieties.

Farmers’ rights are often realised naturally, especially when they cultivate general domestic or local varieties. However, when certain types of cross-bred, hybrid or “high-yielding variety” seeds are used, it may not be worth saving the seeds or propagating materials because of second generation sterility. This is an outcome of the breeding involved in these varieties. The “Green Revolution” trend towards marketing of hybrid varieties has been the subject of NGO criticism for decades. In response, agricultural departments could explicitly require that varieties which succumb to second generation sterility are clearly

marked as such, as a labelling or marketing requirement. However, it is unlikely that many farmers do not already know about this issue. Alternatively, agricultural departments could actively promote varieties which can be re-seeded. They could also prohibit deceptive marketing (discussed in the following section).

More recently, and of a more acute concern, the issue of Genetic Use Restriction Technologies has arisen. The aim of these technologies is to restrict the use of germplasm, by controlling the expression of a gene associated with particular traits or with genes that are crucial to plant reproduction.⁷² For this reason they have been dubbed “terminator technology” by influential NGOs, who have raised concerns that if the technology is successful, farmers will not be able to save their seeds for the following season and will consequently become dependent upon seed manufacturers for their supply of seeds.

The Indian PVPFR Act explicitly excludes GURTS from *registration* and protection (Art. 29 (3)), explaining that they are included under technologies that are injurious to the life or health of human beings, animals or plants. Under TRIPS, WTO members may exclude inventions subject to national ordre public and morality concerns (Art. 27.2). Legally, countries have the right to determine if GURTS are immoral and contrary to public order. After demanding the de facto moratorium on GURTS is maintained in CBD COP-8 talks, most developing countries have also banned field-trials.⁷³

More generally, there may be concerns about the environmental and health impacts of genetically modified organisms (GMOs), as well as moral concerns in certain countries or communities. It is conceivable that these could also be restricted under a PVP law, although concerned countries might also opt to restrict field trials and production through biosafety laws. Thailand has taken the former route by imposing limitations on GMOs in its PVP law. The law prohibits the registration of a new plant variety that has “severely adverse impact, directly or indirectly, on environment, health or public welfare” (S.13). This section stipulates that a new plant variety derived from genetic modification may be registered only “upon the successful results of a safety appraisal with regard to environment, health or public welfare”.⁷⁴

In both India and Thailand, the law requires farmer participation in the decision-making activities of their respective PVP authorities’ committees, although the number of participants allowed is low in both cases. During the drafting of both laws, there was reputedly considerable public input, including that from farmers’ organisations.

Summary: *sui generis* elements for addressing farmers' rights concerns could include:

- Protection of the right of farmers to: save, use, sow, resow, exchange, share, or sell their farm-saved seed;
- Direct participation of farmers in policy-making and decision-making, including positions on PVP committees;
- Recognition and benefit sharing, where TK has contributed to a variety's development;
- Marketing and labelling requirements;
- Restrictions on potentially immoral or harmful technologies, or those contrary to public order, which may include GURTS and certain GMOs.

3.10 Addressing Food Security, Food Sovereignty and Rural Poverty

Food security and food sovereignty represent a complex set of issues and concerns, particularly for rural populations in Asia. Many of these concerns are similar to farmers' rights concerns and therefore the suggestions in the previous subsection are relevant. The ability to control farm inputs and maintain livelihoods is at the heart of the issue.

In response to the concerns surrounding hybrid varieties, which are often marketed and labelled as "high-yielding" but which also require the re-purchase of seeds after each cultivation season, a number of measures might be taken. The Indian PVPFR law has an interesting farmers' right provision related to marketing or labelling disclosure (Art. 39.2). It requires that breeders must disclose to farmers the "expected performance under given conditions", and that if such propagating material fails to perform adequately the farmers can claim compensation via the PVPFR authority. This is likely targeted at deceptive marketing or labelling claims of high-yield varieties that unfairly raise the expectations of farmers, and which may affect their food sovereignty and debt. The Vietnamese PVP law also prohibits misleading advertising relating to plant varieties.

Food security, poverty and debt are closely linked to farmers' rights concerns. Apart from mitigating misleading advertising, a *sui generis* law might target poverty and debt through approaches such as that of the Grameen Bank in Bangladesh.⁷⁵ The Bank offers accessible micro-credit to poor farmers and innovators for various needs. While it is accessible to even the materially poorest individuals, the loans are small and community-based so as to avoid substantial debts. Similarly, agricultural banks could adjust their policies to local economic conditions (e.g. not taking on excessive debt).

In cases where benefits from the utilisation of a genetic resource accrue to a fund, a variation of the micro-credit approach could be utilised to encourage farmer innovation. Where farmers can demonstrate or document their contribution to the development of a genetic resource (e.g. a history of cultivation and breeding) they could draw small amounts as an incentive (return payments not required) or as a low interest loan. The difficulty with this approach would be ensuring the effective use of funds in agricultural and rural development activities, and ensuring that the distribution of funds among rights holders is equitable.

Summary: *sui generis* elements addressing food sovereignty and rural poverty could include:

- Punishments for deceptive marketing regarding the yield, quality or characteristics of a protected variety;
- Policies of micro-credit for poor farmers and innovators, as well as appropriate debt-reduction strategies.

3.11 Traditional Knowledge Protection and Promotion

Gupta (c2004; 2001) presents a clear and important conceptual overview of TK associated with genetic resources. There are typically overlapping and contested domains of individual, communal and public domain traditional or local knowledge. Some of this knowledge may be shared (communal and public), some may be secret (individual and communal) and some may be sacred or spiritual (and can potentially be all three). This will give rise to complex relationships with biodiversity resource regimes, including private, common, state, and open access. Therefore, respecting TK in the new context of expanded global IP rights is a highly complicated and fraught process. *Box 1* overleaf provides some examples of TK from India and Thailand.

A range of the concepts already discussed contribute, directly and indirectly, to the protection and promotion of TK. These include PIC mechanisms; benefit sharing; the promotion of farmers' rights and livelihoods; and the promotion of domestic, local and wild varieties which have been developed by traditional local communities.

Laws such as the Philippines draft Community Intellectual Rights Protection Act (2001) seek to formally recognise the ownership of IP by indigenous and local communities. The draft act recognises intangible (and tangible) property of communities; requires that consent be sought for access and benefit sharing; and allows for registration of community IP as a defensive measure.

India

- The **neem** tree (*Azadirachta indica*) has been described as a “natural pharmacy”. The extracts of the plant have many practical uses, including in pesticides, fungicides, as an anti-inflammatory, as a preventative measure against malaria and intestinal worms, in household products like soaps, candles, and cosmetics, and as an anti-cancer agent (Posey and Dutfield, 1996:80). The use of the plant in India, where it reputedly originates, has been documented for over 2000 years, and it continues to be used by local communities for agricultural and medicinal purposes. In recent years extracts of the neem tree have been the subject of numerous patent claims worldwide, some of which have fuelled “biopiracy” campaigns by NGOs and activists.
- **Turmeric** spice powder from the turmeric plant (*Curcuma longa* Linn) has been used traditionally in India for the treatment of wounds, where its application is common knowledge. The natural anti-bacterial agents of the powder inhibit infection. This application was also the subject of a US patent which caused considerable controversy in India. The patent was ultimately revoked due to a lack of novelty (Dutfield, 2004:50).

Thailand

- The shrub or small tree (*Croton sublyratus* Kurz) known in Thailand as **plao noi** is reputed to have anti-diarrhoeal qualities and has been used as a traditional treatment for gastric illnesses for centuries. It has also been documented historically in traditional medicinal palm-leaf documents called *Samutkhoy*. The plant grows in only very specific conditions in Thailand, with some possible distribution in adjoining countries. The extract of the herb is now the subject of a patent by a Japanese company. Some NGOs and government officials have expressed their displeasure at the patent, and the lack of benefit sharing from the company.
- The Karen people of northern Thailand use the bark of the *Pterocarpus* tree as an organic method of pest control (Santasombat, 2003:28). They soak the bark in water and pour it across the top of the rice plot, allowing the solution to seep into the rice stalks and leaves. This discourages insect infestation.

Box 1: Examples of Traditional Knowledge from India and Thailand

The other main protection measure that has been widely discussed is the concept of TK registries and databases. There are many ways to establish databases and registries, but to be effective they should be carefully designed, clearly explained, accessible, but also sensitive to customary rules. In order to achieve this, the database should document the plant variety, its attributes, its distribution (even approximately), as well as the owners of physical property rights, the groups who have TK of its uses, groups who act as custodians, and any customary protocols associated with its use. A detailed and accessible database such as this could be an effective way to prevent misappropriation, but the complexity of any such database may affect the ease with which stakeholders or officials could register entries.

Indian databases and registries, such as the Honeybee Network database of traditional knowledge, have been very successful in their documentations, with more than 10,000 entries. Official Indian databases are reported to have over 100,000 entries. Databases in other countries such as Thailand have had less success, with only a few thousand registrations. The total number of registrations will likely also reflect the complexity of entry requirements.

Under the Indian Biological Diversity Act, the National Biodiversity Authority is coordinating local People's Biodiversity Registers (PeBRs) across the country. At each local area the Biodiversity Management Committee (BMCs) must help facilitate the documentation of TK related to biodiversity and its many facets. A National Workshop on People's Biodiversity Registers was held in June 2006.⁷⁶ The compilation of PeBRs involves obtaining PIC from local communities. In fact, each community controls the entire PeBR process, with the assistance of NGOs and the BMCs (National Biodiversity Authority, 2006). Only knowledge for which consent is granted is shared. Knowledge will be coded differentially depending upon the desire of the communities – some will be kept confidential (where it is considered secret or sacred knowledge) and some will be available to the public. At the discretion of the local communities, the information will be linked to a larger Indian Biodiversity Information System (IBIS).

The scale of this task is enormous, but the PeBRs development process has already reached a remarkable level of complexity. A working plan has been conceived for the development, by mid-2007, of rules (under the Biological Diversity Act), processes, technical measures (including development of the nationwide IBIS and incorporating open source People's Biodiversity Register Information Systems – PeBINFO), PeBRs Methodology Manuals for use at the BMC level and for the establishment of Technical Support Groups (including taxonomists and ecologists, expert farmers and computer scientists) amongst other measures (National Biodiversity Authority, 2006). As the PeBRs system is developed across India, it will provide important insights for the development of similar projects in other countries.

In order to limit misappropriations of TK, it would be pertinent for these databases to be accessible to patent and PVP examiners, as well as applicants. Linked with disclosure requirements as part of PVP and patent laws, this could help limit misuse and biopiracy of TK. Recently the WIPO secretariat has undertaken a questionnaire on the use of databases and registries related to TK and genetic resources.⁷⁷ This builds on an inventory of all relevant existing online databases containing data on TK.⁷⁸ They have followed these consultations with a current Questionnaire on Recognition of Genetic Resources and Traditional Knowledge in the Patent System.⁷⁹ The ultimate aim of these consultations is to develop a critical mass of information about existing databases and their use and relevance for demonstration of prior art in patent

examinations. With increased use of databases, patent and PVP examiners at the national and international level could help reduce misappropriations of TK and genetic resources.

Summary: additional *sui generis* elements for TK protection and promotion could include:

- Formal recognition of the intellectual contributions of traditional local communities and farmers;
- Databases and registries, including stipulation of the information to be registered. Databases should be accessible to applicants and examiners of PVP registrations and patents. These could also be linked to disclosure requirements.

3.12 Indigenous and Local Community Rights and Customary Protocols

Recognition of the rights of traditional local communities is probably the most fundamentally important way to ensure the protection of traditional knowledge, practices, languages, customs and culture. The Philippines formally recognise and clarify the rights of indigenous peoples and indigenous cultural communities in their 1997 Act. The law seeks to recognise their economic, social and cultural well being (and in doing so their civil and political rights), and the applicability of their customary laws in relation to property and ancestral domains. There are a range of provisions for community intellectual rights; protection of indigenous culture, traditions and institutions; right to indigenous knowledge systems and practices; access to biological and genetic resources; sustainable agro-technical development; and other matters. With the ability to determine their own way of life, their livelihoods and their future, indigenous and local communities will be much better placed to protect their own knowledge and resources.

In WIPO and CBD discussions, the resolution of TK issues is often linked with recourse to customary protocols and laws. Yet it is not clear exactly how respect for customary protocols and laws can be integrated into mainstream patent and PVP systems. One mechanism, albeit one which would require substantial research, would be to link TK/genetic resource databases with registers of customary protocols, or to include stipulation of customary protocols as a registration condition. As a consequence, when individuals seek to access genetic materials and TK, they could view customary protocols and comply with them as part of the PIC process. The registration of information in the Indian PeBRs allows recognition of these customary considerations, by placing control of the system in the hands of local communities. This could be used as a template for registers in other countries.

In discussions at the ABS Working Group of the CBD, some delegates have argued that the integration of customary protocols and laws into access regulations could increase the transaction cost of research activities, as could PIC procedures. This is probably only true in cases where the research activities have sought direct access to *in situ* genetic resources and TK (i.e. bioprospecting activities). Generally, national *ex situ* materials can be accessed with PIC of the national authority, in some cases with facilitated PIC of local groups where they are known by the authority to have a direct interest in the material. In the current defensive biological resource research climate, foreign⁸⁰ *in situ* research activities are becoming increasingly scarce (Hayden, 2003; ten Kate and Laird, 1999). Where foreign ethno-botanists and bioprospectors seek access to *in situ* materials and related TK, it is essential that they take ethical responsibility for their actions. This includes respect for customary protocols and laws. With developments in international law such as the CBD Articles 8(j) and 10(c), the dignity and rights of traditional local communities and farmers cannot continue to be abused by researchers.

Aside from a database approach, projects could be developed which respectfully document customary protocols and laws. This could have the overall effect of strengthening the customary rights of local communities over land, natural and intellectual resources. The most effective way of undertaking this would be for locals themselves to perform the documentation, with appropriate assistance provided if required. But this is probably an oversimplification of the dynamism inherent in customary protocols and law. As WIPO has noted,⁸¹ a customary law system may be regarded as "a living law, a law activated and modified not by specialised practitioners but by those who in their daily lives, practice the law, living out their traditional customs in everyday contacts".⁸² As such, the documentation of customary protocols may only freeze a static version in time, which may not be in keeping with evolving practices by local communities.

Summary: *sui generis* elements for indigenous or community rights and customary protocols could include:

- Explicit recognition of the rights of indigenous and local communities to a range of relevant matters. This could include more formalised recognition of customary protocols and laws;
- Customary protocols and laws could be documented and/or registered alongside TK and genetic resources in national databases.

3.13 Administration, Dispute Settlement, Enforcement and Remedies

Although there has been considerable initiative in the development of unique laws, or unique components of laws throughout Asia, the implementation of these components has been more problematic. Often there is no supporting

regulation, it is under review, it is not yet effective, or it does not work in practice. This is primarily a result of the lack of precedent, with unique laws such as the Thai and Indian PVP laws having no prior examples on which to base their administration. Similarly there are often issues of jurisdiction between agricultural, environmental, forests, biodiversity and even health departments,⁸³ relating to biological resources. The laws covering different kinds of biological resources need to be carefully drafted so as to avoid overlap. Due to the recent implementation of PVP laws in many of these countries, appropriate technical assistance and the sharing of experiences will be useful in improving the practical effectiveness of laws. As the Thai PVP Act, the Indian PVPFR Act, and the Indian Biological Diversity Act further develop their regulations and operational capabilities, their experience will provide a good template for other countries.

It would also be useful to establish a single national focal point (as suggested in the Bonn Guidelines) for a range of matters, including the handling of access to genetic resources and also complaints (e.g. misappropriations, overlapping claims and similar matters). Such a body could be linked to an independent ombudsman's office to oversee administrative procedures and ensure laws are appropriately followed and harmonised between government departments. The transparent operation of plant variety funds (or similar) could be separately monitored by the independent ombudsman. It could also help coordinate matters where there is an overlap of jurisdiction, such as between biodiversity and PVP authorities.

Laws must be enforced in various ways by their respective departments. It may be burdensome for PVP authorities to investigate misappropriations and unlicensed use of protected varieties; therefore there is an onus on the complainant party to provide evidence.⁸⁴ Those who infringe *sui generis* rights, just like IPRs, should be liable to civil, administrative and criminal penalties. Punishments for infringements of domestic, local and wild variety protection should ideally be on a par with punishments dealt to new PVP infringements. Failure to provide benefits arising from the utilisation or commercialisation of plant varieties could similarly give rise to civil, administrative or criminal penalties.

Dispute settlement may be a matter for national, specialised IP courts, of which there are now a number in Asia.⁸⁵ Notably, these courts are usually burdened with IP rights infringement (particularly copyright and trademarks) cases brought by foreign parties. Alternatively, where a matter involves issues such as TK, the department may wish to allow recourse to a less formal alternative dispute resolution mechanism, or to local customary dispute settlement subject to customary protocols and laws, as appropriate.⁸⁶

Summary: *sui generis* elements related to administration, dispute settlement, enforcement and remedies could include:

- Clear delineation of jurisdiction and authority between different types of genetic resources;
- National focal points for facilitated access to biological resources and clear directions to appropriate consent authorities;
- An independent ombudsman's office to oversee administrative procedures and ensure transparency in the operation of benefit sharing funds;
- Appropriate enforcement and civil or criminal penalties for infringement of laws;
- A number of dispute settlement options. These could include local customary dispute settlement procedures where local groups are involved.

4. CONCLUSIONS AND RECOMMENDATIONS

This paper suggests a range of components and elements for potential *sui generis* systems of plant variety protection and the legal handling of traditional knowledge. It emphasises the fact that countries have considerable space for the development of unique laws, subject to the obligations imposed by international agreements. Clearly, patent protection of plant varieties and their components may be at odds with the interests of developing countries throughout Asia. This is due to a range of concerns including: the consolidation of global seed and agricultural industries, the potential economic and environmental impact of GMO plants, the protection of TK, food security, seed prices, R&D and technology transfer. Furthermore, UPOV-style new PVP may provide a limited scope of protection recognising only value-addition in new varieties, and is oriented towards advanced breeders. Therefore there is clear scope for countries in Asia to adapt or innovate towards laws which are more suitable for their own state, farmer and community needs.

This paper bases many of its suggestions on the past experiences of Asian country governments which have developed unique approaches to suit their public policy agendas. It also makes further suggestions based on the concerns of academics, indigenous and local communities, NGOs, activists, and farmers' groups. Briefly, these include protections for domestic, local and wild varieties; disclosure requirements; ABS measures; prior informed consent; promotion of local and domestic innovations; respect for indigenous and community rights including customary protocols; and farmers' rights provisions. For simplicity, the main recommendations of each section have been summarised for consideration.

As a consequence, policy makers should deliberate over which components would be most suitable for their country's development needs and public concerns. A one-size-fits-all law may be inoperable or dysfunctional by attempting to resolve too many concerns. Rather, countries may want to follow the approaches of others such as India, Thailand and the Philippines, which have each developed a range of unique laws which deal with PVP concerns and the legal handling of TK in different ways.

Countries also need to recognise that over-regulating agricultural genetic resources may have the negative consequence of discouraging innovation, and may be contrary to the historical interdependence between countries with regard to the sharing of germplasm. National authorities should balance these factors against the desire to ensure sovereign control of biological resources. A selection of the most pertinent *sui generis* components and elements would be prudent, to balance the promotion of agricultural innovations and the protection of broader public interests.

National authorities, policy-makers and interested groups should continue to watch closely the regulatory developments of PVP and biodiversity laws, particularly in India and Thailand. Both these countries are on the verge of advancing the implementation of *sui generis* laws, which has been a considerable challenge to date. In particular, the Thai PVP law (favouring liability rather than exclusive property protections) presents a model which has fewer substantial administrative burdens, and would be suitable for most developing and least developed countries in Asia.

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ENDNOTES

¹ See for example, Srinivasan, C.S. (2003) at p.519 – 546; Dutfield (2003) at p.144-162; or Falcon and Fowler (2002) at p.204-207.

² The Regional Research Agenda was established in Hong Kong in November 2004 at a dialogue organised by ICTSD-UNCTAD, IDRC and Hong Kong University. Contributing to recent debates, the Regional Research Agenda seeks to: a) To provide a platform for a strategic discussion between relevant stakeholders (Geneva-based negotiators, capital-based policy makers, academia, the private sector and NGOs) on relevant trends and thematic issues in the IP area and their implications for sustainable development; b) To develop elements of a "regional agenda" for development-oriented IP policies and informal mechanisms for advancing it in the coming years through, among others, joint research and networking; c) To analyse current trends in IP standard-setting in the East and South East Asian region; d) To explore linkages between sustainable development policies and IP in four specific issues areas, including health, plant varieties and biotechnology, geographical indications and providing incentives for public interest R&D. See this link for details: http://www.iprsonline.org/unctadictsd/dialogue/2004-11-08/2004-11-08_desc.htm

³ See for example: Leskien and Flitner (1997); Dhar, (2002); and Helfer, (2002).

⁴ The extensive obligations placed upon member states by TRIPS are thoroughly discussed in the UNCTAD/ICTSD *Resource Book on TRIPS and Development* (2005). This should be referred to for a full understanding of substantive obligations and is available at <http://www.iprsonline.org/index.htm>.

⁵ Note – emphasis added.

⁶ See Leskien and Flitner (1997) at p.26.

⁷ See the WTO TRIPS issues (Art 27.3b) page for documentation of the discussions occurring under the 2001 Doha mandate: http://www.wto.org/english/tratop_e/trips_e/art27_3b_e.htm

⁸ This definition recognises the *existence* of plant groupings which are less uniform than those which conform to UPOV uniformity requirements. See Leskien and Flitner (1997) at p.48-9 for a full explanation.

⁹ UPOV 1991 Art.14(1)(b) describes an EDV: "a variety shall be deemed to be essentially derived from another variety ("the initial variety") when (i) it is predominantly derived from the initial variety, or from a variety that is itself predominantly derived from the initial variety, while retaining the expression of the essential characteristics that result from the genotype or combination of genotypes of the initial variety, (ii) it is clearly distinguishable from the initial variety and (iii) except for the differences which result from the act of derivation, it conforms to the initial variety in the expression of the essential characteristics that result from the genotype or combination of genotypes of the initial variety."

¹⁰ Heckenberger et al. (2005) indicate that genetic distances based on molecular markers have been proposed as a tool to assess the genetic conformity between EDVs and initial varieties, using maize (*Zea mays* L.) as an example. They note that reliable benchmarking data is lacking to allow identification of EDVs.

¹¹ This is discussed further in Section 3.3.

¹² See Leskien and Flitner, (1997) at p.36-7.

¹³ See Taubman (2005).

¹⁴ "Ex situ" genetic resources refer to samples of biological materials stored in gene banks, herbariums, research institutes and other simulated environments. "In situ" genetic resources include those that exist in their natural, wild, or domesticated agricultural environments.

¹⁵ For an overview of the talks see: ICTSD, "Model Agreement Adopted for Access and Benefit Sharing of Genetic Resources" *Bridges Trade BioRes*. Vol. 6-12. 30 June 2006.

¹⁶ Understood to mean: materials of plant origin, including reproductive and vegetative propagating materials, containing functional units of heredity (Art. 2).

¹⁷ Understood to mean: material that is not ready for commercialisation.

¹⁸ *Sui generis* means "unique", derived from Latin meaning "of its own kind" according to the *Concise Oxford English Dictionary*, 10th edn.

¹⁹ Status on November 24, 2006 (UPOV, 2006).

²⁰ Thailand, on the other hand, separates jurisdiction between a health authority and an agriculture authority, which has caused some teething problems for the implementation of their laws.

²¹ See Hossain, M.G. (c2003). The development of the Bangladesh PVP law (and related laws) has been interrupted by technical assistance consultants suggesting amendments to the law, as well as bilateral negotiations and pressures from the EU and the US.

²² Note that the rules for persons who may make application under Article 16 are quite broad. It seems inevitable that there will be some disputes over who has legitimate authority to register an extant or farmers' variety and how they can be held accountable to the diverse number of other potential

contributors to the breeding of the variety. The Regulations under the Act and the registration forms, only recently released, include documents attempting to clarify authority and proof of right to represent a community, and only with approval of the concerned Panchayat Biodiversity Management Committee, or District Agricultural Officer, or District Tribal Development Officer.

²³ See Section 3.3 for a more detailed discussion of the main differences between the laws.

²⁴ Notably, the Indian Biological Diversity Act does not apply this standard relating to access requirements, as distinct from intellectual property rights requirements (discussed in Section 3.6).

²⁵ Leskien and Flitner (1997), p.57.

²⁶ Dutfield (2006) has alternatively argued for a “proof of legal acquisition” requirement in international patent law, which also has relevance here. Such a requirement might be less onerous on the plant variety applicant and examiner than an “origin” requirement.

²⁷ See ICTSD (2 Feb. 2007) “ABS experts flesh out certificate of origin” *Bridges Trade BioRes*. At <http://www.ictsd.org/biores/07-02-02/story4.htm>

²⁸ A protected commons concept refers to the IP protection (through patent, or in this case plant variety, protection) of the subject matter, whilst still allowing researchers to access it under the provision (usually by contract/MTA) that they do not seek their own IPRs over subsequent innovations on the product. It is based on open source principles which have emerged from the software industry. See Section 3.9 for further details of this concept and the approach of the CAMBIA organisation.

²⁹ Notably, neither the Thai nor Indian PVP laws operate as purely a liability (i.e. use now pay later) or property rights regime: they contain elements of both. Furthermore they contain elements of both “positive” and “defensive” protection. As Dutfield (2006: 22) notes, the distinction is rarely clear cut. These terms can be somewhat deceptive as to the variable nature of *sui generis* PVP, TK and related laws, which are typically hybrids of such concepts.

³⁰ An extant variety under the PVPFR Act is “notified under the Seeds Act 1966,” or “farmers’ variety,” or “a variety about which there is common knowledge,” or “any other variety which is in the public domain” (Art. 2j).

³¹ One of the most important conditions is for application for registration which must “contain a declaration that the genetic material or parental material acquired for the breeding, evolving or developing the variety has been lawfully acquired.”

³² See Ramanna, A. and Smale, M. (2004) p.423-442; and Ramanna, A (2003).

³³ The Society for Research and Initiatives for Sustainable Technologies and Institution (SRISTI) is one such organization. See <http://www.sristi.org/>

³⁴ See the “*Promoting Domestic and Local Innovations*” section of this paper and the CAMBIA website for more information on the concept of a protected commons, and “biological open source” systems.

³⁵ Details of the meeting are available at: <http://plantauthority.in/>

³⁶ Notably there was an emphasis only on registration of domesticated varieties which are still grown in a sizable area, and are making contributions to food and income security. The registration of wild varieties was a lesser concern. The idea behind this distinction may be to allow concentration on registration of varieties that are useful for the above reasons, without cluttering the PVP Authority with registrations for wild varieties. Alternate measures are being taken to conserve wild varieties under the Indian Biological Diversity Act (Ch. X), but these were not mentioned in the meeting report. This is discussed further in Section 3.5.

³⁷ Composed of seven persons, including one farmers’ representative, one seed industry representative, and other subject matter specialists (Art. 6 PVPFR Regs.)

³⁸ Even UPOV Test Guidelines (2006) allow for the variation of uniformity between years in the measured characteristics of new cross-pollinated varieties, through the Combined Over Years Uniformity (COYU) method.

³⁹ See Kanniah (2004); and Azmi (2005).

⁴⁰ The Thai PVP Act S.3. defines “general domestic plant variety” to be “a plant variety originating or *existing* in the country and commonly exploited and shall include a plant variety which is not a new plant variety, a local domestic plant variety or a wild plant variety.” Note: emphasis added.

⁴¹ These include interviews with Ubong Yuwaa, Alternative Agriculture Network leader (May 2005); Daycha Siripat, Director of Khao Kwan Rice Research and Training Institute (April 2005, December 2006); Witun Lianchamroen, Director of NGO BioThai (March 2005, December 2006); Dr Jakkrit Kuanpoth, Senior Lecturer, University of Wollongong (February 2005); Surakrai Sungkasubuan, Director, Plant Variety Protection Division of the Department of Agriculture (December 2006); and Professor Saneh Chamarik, Chairman of the National Human Rights Commission of Thailand (May 2005).

⁴² But notably, it does not define what constitutes “commercial interests.” Research for non-commercial purposes must comply with Ministerial Regulations which have not yet been passed by the Council of State.

⁴³ Officials note that they have a policy of PIC with local communities and farmers’ groups.

⁴⁴ Note the mention of “existing” varieties in the Thai PVP Act definition provided in footnote 40, and the mention of “public domain” varieties in the Indian PVPFR Act at footnote 30.

⁴⁵ In the case of domestic varieties it is highly unlikely that monetary benefits can be distributed directly to farmers for logistical reasons.

⁴⁶ In the previous section, the PVPFR Regs and MSSRF report extract indicates a number of Indian local varieties with adaptations to highly specific ecosystems.

⁴⁷ See Gupta, A. (c2004), at p.27, on the conceptualization of communities.

⁴⁸ The term of protection varies depending upon the type of plant, from 12 years for plants which seed or fruit annually, or more often, to 27 years for trees (S.31).

⁴⁹ Witoon Lianchamroen (March 2005); Dr Jade Donovanik (May 2005).

⁵⁰ Geographical indications protection has been pushed by a number of Asian countries in the WTO, particularly for general domestic varieties such as Jasmine Rice (Khao Hom Mali) and Basmati Rice. One of the criticisms of this proposal has been that these varieties are broadly distributed and represent generic names and therefore shouldn’t qualify for protection. Notably, many Thai rice varieties are named after their place of origin, having originally been of local or regional origin (e.g. Pathumthani and Suphan Buri rice varieties).

⁵¹ The Indian Biological Diversity Act (Ch.X) defines “landrace” as a “primitive cultivar that was grown by ancient farmers and their successors.” This is opposed to a “folk variety” or “farmers’ varieties,” which can be categorised along with extant varieties. A “folk variety” is described by the Indian Biological Diversity Act as “a cultivated variety of plant that was developed, grown and exchanged informally among farmers.”

⁵² See Gupta, A. (c2004) p.81-102.

⁵³ Although notably it took some considerable investigation to re-trace and identify the origins and knowledge-holders in this case.

⁵⁴ See Sagar, (2005) at p.388-389, and p.400.

⁵⁵ For example, the Thai Traditional Medicinal Intelligence Act sets aside rare herb conservation areas where they are being misappropriated or overexploited. One herb, White *Kwao Krua* (*Pueraria mifida*), which has been patented and commercialised by Thai and foreign researchers, is now overcultivated in the north and northeast of the country. Consequently, restricted cultivation is being enforced and designated areas set aside for conservation of the herb.

⁵⁶ The Thai Plant Act requires registration of plant species before sale to the public. Thai government officials have noted that despite efforts to reduce the trade in rare or protected domestic biodiversity and other endangered species under CITES, they are still traded in markets in Bangkok.

⁵⁷ DNA fingerprinting has been adopted by researchers and authorities for the identification of plant varieties and genetic resources in the perceived biopiracy of Basmati Rice; and relating to controversial Jasmine Rice trademarks and international genetic resource transfers.

⁵⁸ See Greene (2004); ten Kate and Laird (1999) at p57;

⁵⁹ See Mateo (2000).

⁶⁰ See Dutfield (2004) at p.19-20; Svarstad (2000) at p.145-153.

⁶¹ See Gupta (c2004) at p.75.

⁶² Ibid, at p.103.

⁶³ See Kaosa-ard (1995)

⁶⁴ See Wynberg (2004)

⁶⁵ ANDES, IIED, FIELD and Netherlands Ministry of Foreign Affairs (2006)

⁶⁶ See Brahma, *et al.* (2004).

⁶⁷ See also section 3.13.

⁶⁸ See the Bonn Guidelines, Appendix II for other types of monetary or non-monetary benefits.

⁶⁹ Consider, for instance, relatively isolated traditional communities, and the effects an inflow of money might have on the maintenance and functioning of their culture and norms. Whatever form of “benefit” is put forward, it needs to be appropriate. During fieldwork in a Karen village in Chiang Mai, Northern Thailand, some elders resisted a university project to install solar panels in their village, that would increase the availability and use of electricity, because it would change the village. The same elders speculated on the effects a paved road would have in bringing outside influence to their community’s traditions (Interviews by the author, Feb. 2006).

⁷⁰ Although even this may occur rarely, with medicinal plants often distributed across borders and historically traded between countries, or collected by botanists. More endemic to a country or local region might be the TK and know-how involved in traditional plant based medicines.

⁷¹ See www.cambia.org for details of the biological open source project.

⁷² See Hubicki and Sherman (2005); and Visser *et al.* (c2003) for an overview of GURTS technologies and implications.

⁷³ ICTSD, BioRes. 3rd April, 2006

⁷⁴ These appraisals are made by the Department of Agriculture, or other bodies designated by the PVP Committee, and in accordance with Ministerial Regulations.

⁷⁵ The Grameen Bank and its founder, economist Muhammad Yunus, were jointly awarded the 2006 Nobel Prize for the unprecedented success of the initiative. See: <http://www.grameen-info.org/>

⁷⁶ The meeting documents can be found online at: <http://www.nbaindia.org/pbr/pbr.htm>

⁷⁷ This is WIPO document: [WIPO/GRTKF/IC/Q.4](http://www.wipo.int/TK/en/consultations/questionnaires/ic-q4/index.html) available at: <http://www.wipo.int/TK/en/consultations/questionnaires/ic-q4/index.html> Acc 8/2/2007.

⁷⁸ This is WIPO document: [WIPO/GRTKF/IC/3/6](http://www.wipo.int/documents/en/meetings/2002/igc/pdf/grtkfic3_6.pdf) available at http://www.wipo.int/documents/en/meetings/2002/igc/pdf/grtkfic3_6.pdf Acc 8/2/2007.

⁷⁹ This is WIPO document: [WIPO/GRTKF/IC/Q.5](http://www.wipo.int/TK/en/consultations/questionnaires/ic-q5/grtkf_ic_q5.pdf) available at http://www.wipo.int/TK/en/consultations/questionnaires/ic-q5/grtkf_ic_q5.pdf Acc 8/2/2007.

⁸⁰ But notably domestic research activities seem to be continuing in countries like Thailand, even though access regulations and PIC procedures are still not formalized.

⁸¹ WIPO is currently undertaking consultations on customary laws and protocols. Details can be found at: http://www.wipo.int/TK/en/consultations/customary_law/index.html Acc 8/2/2007.

⁸² Cited by Dutfield (2006), at p.24.

⁸³ Some plants witness an administrative overlap between medicinal and agricultural jurisdiction, as has been the experience between Thai authorities.

⁸⁴ Notably this is a more difficult burden on those who have limited resources for the pursuit of such complaints.

⁸⁵ See Ariyanuntaka (1999); and Antons (2006).

⁸⁶ See for example, Daryono (2004), who details some of the pros (e.g. respect of traditional customary law) and cons (such as sacrificing legal certainty) of alternative dispute settlement with regard to customary *adat* land disputes in Indonesia.

⁸⁷ Most national law documents were obtained from the WIPO Collection of Laws for Electronic Access (CLEA) at <http://www.wipo.int/clea/en/> between 2005 and 2006 unless otherwise specified. Other laws were obtained directly from the departments or their websites by the author. Where possible, the author has attempted to determine the current status of the laws.