1. Introduction and overview

1.1 GENERAL AND SPECIFIC OBJECTIVES

This book considers the proposition that global institutional reforms that govern the present and future allocation of rights on, and wealth from, crop diversity are insufficient—and in some respects inappropriate—to achieve international equity in terms of the way plant genetic resources are transferred, how agricultural research is conducted, and its benefits are shared. Its focus on ownership regulation derives from the paramount importance that both the design and allocation of rights in plant genetic resources might have for global food security due to their implications in terms of wealth and resource allocation within the agriculture sector. Thus, the subject matter under consideration is the study of normative aspects of global institutional reforms that concern agricultural innovation systems and the commodification of crop diversity.

The commodification of crop diversity can be defined as the adoption, harmonization and implementation of laws and international law instruments, which determine the allocation of legal entitlements to manage and control plant genetic resources, their derivatives and the benefits thereof. On the other hand, ‘the concept of ‘innovation’ refers to the search for, development, adaptation, imitation and adoption of technologies that are new to a specific context’.¹ Within the above subject matter, this book has three specific objectives:

1) to analyse the limitations and systemic weaknesses of global institutional reforms that concern agricultural innovation systems and the commodification of crop diversity;

2) to assess the developmental implications of changes in the legal status of plant genetic resources for food and agriculture (PGRFA),

taking into account the need to secure a more equitable distribution
of wealth among affected stakeholders, including those who operate
in the informal seed sector and their development needs; and
3) to elaborate available options to facilitate access to PGRFA,
agricultural knowledge, and science and technology for sustainable
agricultural development through enabling legal instruments and
mechanisms, including the full implementation of the Multilateral
System of access and benefit sharing under the International Treaty
on PGRFA and its Standard Material Transfer Agreement.

The innovation system perspective is useful to place the appropriate
emphasis on institutions, because it postulates that social and economic
development ‘is driven by the institutional context in which technological
change occurs’, rather than by such change per se.2 Therefore, in order to
meet the first specific objective, which focuses on limitations and systemic
weaknesses, this book addresses the question of how global institutional
reforms regarding plant genetic resources are changing the balance of
rights on which access to, and reward of, agricultural innovation depends.

In order to meet the second specific objective, the book frames the
policy debate on the developmental implications of international
agreements concerning crop diversity in terms of transition between
property regimes. However, this approach does not intend to prove the
validity of a particular theory in the chosen context. Rather, it uses the
lessons learned from various theoretical insights and conceptual tools
(that are useful to explain such a transition) to supplement the legal
analysis of relevant agreements and negotiating processes, and to assess
the prospects for improvements in the law towards international equity in
agriculture.

This approach leads one to wonder what the implications of the
transition between property regimes (and of the consequent rebalancing
of rights) are, taking into account the need to secure a more equitable
distribution of wealth among affected stakeholders, including those who
operate in the informal seed sector, and their development needs.3

Agricultural Research in Developing Countries’, Innovation Strategy Today, 2/1,
41–54, at p. 50.
3 On the importance of informal or farmers’ seed systems, Louwaars
highlights that:

Farmers’ seed systems are by far the most important suppliers of seed, and are
particularly important for resource-poor farmers. Formal seed systems, on the
other hand, provide tested seed to farmers through an organised and often
Introduction and overview

In order to meet the third specific objective—i.e. to elaborate available options to facilitate access to PGRFA, agricultural knowledge, and science and technology for sustainable agricultural development—this book needs to discuss the question of whether exclusion rights promote more efficient outcomes than an open access regime, in particular by supporting research and domestic innovation capabilities of agricultural innovation systems in developing countries. The analysis of the literature on law, economics, and intellectual property is helpful to assess the validity of the frequent assumption that the creation and allocation of exclusion rights in biological materials is more efficient than a regime of less cumbersome access rules, such as a common pool regime.4

At the outset, this book establishes the factual and theoretical background that is necessary to understand relevant global regulatory instruments in the areas of plant intellectual property and access and benefit sharing (ABS), in other words, the interrelated law-making processes and agreements that concern agricultural innovation systems and the commodification of crop diversity.

regulated chain that includes genebanks, breeders, seed producers and seed marketing and distribution organisations. In practice, these different systems operate side by side to serve the needs of different types of farmers for different types of crops.

N.P. Louwaars (2007), ‘Seeds of Confusion: The Impact of Policies on Seed Systems’ (Wageningen University) at pp. 5 and 29. See below section 2.2.5. Today, the decades-long neglect of developing countries’ agricultural research priorities and needs is having an apparent, outstanding impact on the current food crisis, especially in the African region:

The large increases in food prices in recent years have led to a global food crisis of which low-income food-deficit countries (LIFDCs) are the greatest victims. The fact that most LIFDCs are in Africa has raised serious questions about the performance of the agricultural sector in the aftermath of trade liberalization. ... while trade liberalization addressed policy-induced barriers to trade, it was not integrated with sectoral policies that could have addressed supply-side response issues. The sharp decline in aid to agriculture since the early 1990s reflects not only the limited success of aid to agriculture, but also a shift towards adjustment lending with a greater focus on economic liberalization.


1.2 BACKGROUND AND SIGNIFICANCE

In agriculture, the achievement of equity outcomes for small-scale farmers is crucial for innovation policy reforms towards poverty and hunger eradication.\(^5\) PGRFA, in their dual aspect of environmental and informational resources, may be considered as fundamental components of the ‘technological infrastructure’ that underpins agricultural research.\(^6\) As such, one may argue that they should be managed in an openly accessible manner, because such non-traditional infrastructural resources may generate higher social value and positive externalities if they are managed as commons.\(^7\)

However, legal or contractual obligations which restrict the exchange and use of PGRFA have emerged regardless of whether the social benefits of establishing (and strengthening) such exclusion rights exceed their social costs. Legislative models that may apply to crop diversity, such as patent and ABS systems, were initially developed for other industry sectors such as the chemical and pharmaceutical sectors. This raises concerns as to the future availability of PGRFA as international public goods and calls into question the contribution that the paradigm of a privatized science can make to meet the target of reducing by half the

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\(^5\) The 1960s saw the first Green Revolution. This was based on the so-called ‘package of inputs’ approach, which included the use of improved seeds, irrigation, chemical fertilisers and pesticides. In Asia, this approach increased yields and average farm incomes. However, it was ‘far from a complete solution to poverty and hunger’, as the gap between the rich and the poor increased. This is an important lesson ‘to keep in mind as it highlights the dangers of focusing only on increasing crop agricultural yields while ignoring the social and environmental implications of new technologies’. K. Lobe (2007), ‘A Green Revolution for Africa: Hope for Hungry Farmers?’ Canadian Foodgrains Bank Working Paper. Compare with the views of N. Ngongi, President of the Alliance for a Green Revolution in Africa, who argues that:

Because they have been selected for low-input agriculture, the seeds saved by African smallholder farmers do not have the potential to respond to improvement in soil fertility. … Continuous cultivation in the absence of nutrient replenishment from organic and inorganic fertilizers has resulted in serious soil nutrient depletion … With good agronomic practices and wise use of fertilizers and irrigation, the large-scale adoption of improved varieties should double or triple current yields.


\(^7\) See below section 2.3.6
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The proportion of people who suffer from hunger by 2015 in accordance with goal 1 of the Millennium Development Goals (MDGs).  

In April 2008, UN Secretary General Ban Ki-moon set up a task force to tackle the global food crisis. This crisis not only threatens economic growth and social progress, but has also generated political instability and social unrest in at least twelve countries. In a few months, high food prices pushed 100 million people back into poverty and thwarted seven years of development efforts towards poverty reduction. This crisis is not a natural disaster; it is rather a man-made disaster, which reflects a trend that was evident several years ago.

8 J. Esquinas-Alcazar, former Secretary of the Commission on Genetic Resources for Food and Agriculture, who has been instrumental for the adoption of the FAO International Treaty, argues that ‘access to genetic resources and related biotechnologies is increasingly threatened by the proliferation of intellectual property rights (IPRs) and the expansion of their scope, as well as by the increasing number of national laws that restrict access to and use of PGRFA’. J. Esquinas-Alcazar (2005), ‘Protecting Crop Genetic Diversity for Food Security: Political, Ethical and Technical Challenges’, *Nature*, 6/12, 946–53.


11 UN News Service (2008), *Global Food Crisis ‘Silent Tsunami’ threatening over 100 Million People, warns UN* (22 April 2008).

12 FAO (2006), *High and Volatile Food Prices in the Months to Come*, FAO Newsroom (8 June 2006). The 2007 FAO Food Outlook highlights that seed stocks are being kept at low levels and ‘no longer play their traditional role as a buffer against fluctuations in production and demand. This change has come about because of reduced government interventions associated with a general policy shift towards liberalizing agricultural commodity markets.’ FAO (2007), ‘Food Outlook—Global Market Analysis’, Rome, at p. 49; N. Ngongi (2008), above note 5, at p. 20. The author argues that:

Although the price crises appeared to arise suddenly, it has been building in Africa for at least three decades. ... Structural adjustment programs led to the dismantling of many institutions and programs inherited or established after independence. ... instead of improving the functioning of [parastatal corporations, food security reserves, extension services and cooperatives], donors and, in turn, African countries pursued market solutions that decimated these institutions.
Part of the problem is that in the developing world appropriate inputs such as seeds and fertilisers that can increase agricultural production are unavailable or too expensive for most small-scale farmers. Historically, both at the national and international levels, IPRs and ABS laws and policies have never received the attention given to other global environmental issues that impinge on food security, such as climate change and the production of biofuels. Nonetheless, such laws and policies have a decisive long-term structural impact on the conditions under which crop diversity and, in particular, seeds can be made available.

Other factors, such as insufficient investments and limited human, technical and institutional capacity, also constrain the application of agricultural knowledge, science and technology to agricultural production in poor countries. Against this backdrop, the implementation of relevant multilateral trade and environmental agreements that regulate the use of PGR in a way that is appropriate to domestic needs is a major challenge for the majority of developing countries. In particular, both plant intellectual property and ABS requirements do shape the rules of the game for private and public actors, including countries, corporations, individual researchers and plant breeders down to farmers and consumers. This is because the availability of both seeds and the upstream results of agricultural research—including the research that is undertaken in public universities—depend to a remarkable extent on these rules.

13 Experts have recently considered some of the most important causes of the present critical situation, including: adverse weather and climate change; increased biofuel production and distorting subsidies; high oil prices, which impinge upon the costs of chemical fertilisers and transport; the raising demand for food products from the fast-growing economies of some developing countries, such as China, India and Brazil; and the unintended consequences of measures taken to counter the emergency, such as export bans that will increase prices in low-income food-deficit countries. FAO (2008), above note 10.

14 This has severe implications for agricultural production, environmental management, food security and poverty reduction. ‘The imminent threat of increased hunger would have been lessened if recent decades had not been marked by a lack of investment in agricultural and rural development in developing countries.’ UN (2008), ‘The Millennium Development Goals Report’, at p. 3, Foreword.

1.3 DEFINITION OF KEY CONCEPTUAL ISSUES

The main conceptual issues that inform the development of this book are defined in the following subsections.¹⁶

1.3.1 General legal and policy framework within which the ITPGRFA arises

A crucial issue for food security is the conservation of genetic resources both *in situ*¹⁷ and *ex situ* in national and international genebank collections.¹⁸ In 1983, given the global interdependency of all states in terms of crop diversity, the international community endorsed the creation of the FAO Global System for the Conservation and Utilization of PGRFA. In particular, three components of the Global System have shaped the international regulation of access to plant genetic resources and associated traditional knowledge (TK), benefit sharing and IPR-related matters. They are: the Commission on Genetic Resources for Food and Agriculture (CGRFA),¹⁹ the International Undertaking on Plant Genetic Resources (IUPGR), and the International Network of *Ex Situ* Collections under the Auspices of FAO.

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¹⁶ These concepts and the presentation of relevant instruments and agreements as well as their interpretation will be further discussed in Chapter 4 of this book.

¹⁷ Article 2 of the ITPGRFA states: ‘*In situ* conservation is the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of cultivated species, in the surroundings where they have developed their distinctive properties.’

¹⁸ ‘*Ex situ* conservation is the conservation of components of biological diversity outside their natural habitats.’ Ibid.

¹⁹ The CGRFA ‘is a permanent forum where governments discuss and negotiate matters relevant to genetic resource for food and agriculture’ including their conservation and sustainable utilization, as well as the sharing of the benefits arising from agricultural biodiversity. In the context of this book, the CGRFA has a particular relevance because it has hosted the negotiations of the ITPGRFA. When it was established in 1983, its competence was limited to plant genetic resources. See: FAO Conference Resolution 9/83. However, this mandate was broadened in 1995 to include all biodiversity components relevant to food and agriculture. FAO Conference Resolution 3/95. See also: FAO, ‘About the Commission on Genetic Resources for Food and Agriculture’, available at: www.fao.org/nr/cgrfa/cgrfa-about/cgrfa-history/en/ (accessed 7 March 2011).
1.3.1.1 The principle of common heritage of humankind and farmers’ rights under the International Undertaking

During the ‘Green Revolution’ two factors contributed in a decisive way to the partial success of the campaign to increase crop yields to feed a growing population. On the one hand, national and international agricultural research institutes could freely disseminate technological and scientific advancements relevant for crop improvement. As a consequence, private and public plant breeders could use, improve, develop, and commercialize these techniques and materials without having to worry about the infringement of third parties’ IPRs. This was because at that time IPRs in agriculture were receiving only a limited recognition.20 On the other hand, public agricultural research institutions were free to collect and distribute plant materials from most countries without the need to obey particular legal requirements, because the problems of sovereignty associated with such resources were also perceived as secondary issues.

The IUPGR is a non-legally binding instrument with the specific aim of promoting international action on conservation, sustainable use and availability of plant genetic resources (PGR). When it was adopted in 1983, the principle that PGR should be treated as a common heritage of humankind was enshrined in it. Even though the IUPGR does not mention TK at all, until the end of the 1980s, most agricultural TK associated with PGR (collected during scientific expeditions) was also documented and transferred without following particular formalities under the principle of common heritage of humankind.21

In this period, numerous collecting missions were carried out by international agricultural research institutes, which at a later time joined

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21 The principle of common heritage of humankind plays an important role in explaining the international relations of plant intellectual property and associated environmental issues in the political context of the adoption of the IUPGR. In international law, the principle of common heritage of mankind arises at the end of the 1960s. Its application is confined to non-living resources, which are found in areas beyond national jurisdiction, such as the ocean floor, the space, the moon and Antarctica. I. Mgbooji (2003), ‘Beyond Rhetoric: State Sovereignty, Common Concern, and the Inapplicability of the Common Heritage Concept to Plant Genetic Resources’, Leiden Journal of International Law, 16/04, 821–37, at p. 826. In the 1979 Moon Treaty and the 1982 UN Convention on the Law of the Sea, such principle entails that ‘the resources of these areas cannot be appropriated to the exclusive sovereignty of states but must be conserved and exploited for the
to form the International Network of *Ex Situ* Collections under the Auspices of FAO—also known as the CGIAR. The above activities included the transfer of PGRFA from the countries where such resources where found—i.e. often in the South—to storage facilities, whose 85 per cent was located in the North.\(^2\) These transfers resulted in the South losing direct control over access to a remarkable part of its plant genetic resources.

In the CGRFA, most developing countries initially supported the view that agricultural scientific research and the transfer of *all* PGR should take place in accordance with the principle of common heritage of mankind.\(^2\) However, as soon as the IUPGR recognized the principle of unrestricted access to plant genetic resources, the legal and political environment that had underpinned the Green Revolution underwent a series of deep and—quite possibly—irreversible changes.

In the 1980s, the implementation of plant patents and breeders’ rights in industrialized countries was perceived as a matter of importance for the private seed industry and the enfant biotechnology sector. Besides, the pressure to adopt higher international IPR standards was also mounting on developing countries, including through the Union for the Protection of New Plant Varieties (UPOV) and the inclusion of IPR on the trade-related agenda of the Uruguay Round of the General Agreement on Tariffs and Trade that eventually led to the WTO. While the US, Canada, Australia and Switzerland refused to sign the International Undertaking, developing countries saw plant breeders’ rights in conflict with the farmers’ traditional practices to freely exchange seeds. Developing countries’ concerns were not so much related to a limitation of the farmers’ practices to reuse and exchange saved seeds, which were generally benefits of all, without discrimination’. P. Birnie and A. Boyle (2002), *International Law and the Environment*, 2nd edn, Oxford, UK: Oxford University Press, p. 143.


\(^2\) In particular, Article I of the IUPGR states that: ‘this Undertaking is based on the universally accepted principle that plant genetic resources are a heritage of mankind and consequently should be available without restriction’. As I. Mgbeoji (2003) notes, above note 21, ‘in the movement for a new international economic order, the common heritage concept was … primarily designed to deny the technologically advanced group of states of the North the legal right to exploit and lay claims … of ownership over the last frontiers of the world …’, including those opened by plant genetic research and biotechnology.
accepted under the 1978 UPOV Act. At that time, they were primarily protesting the alleged violation of the so-called principle of ‘reciprocity’. Such principle can be regarded as an application of the principle of equity and entails the moral obligation to give back what is received in equal measure or under equal terms.24

Together with the impasse on the limited acceptance of the common heritage principle, the ensuing international controversy on farmers’ rights played a pivotal role in leading to the revision of the International Undertaking. Between the late 1980s and the early 1990s the FAO Conference adopted several resolutions with a view to achieving a balance between conflicting interests of developed and developing countries.

In the FAO Conference of 1989, the concept of farmers’ rights was conceived by developing countries as a counterbalance to plant breeders’ rights under the 1978 Act of the UPOV Convention. FAO Resolution 5/89 endorsed the concept of Farmers’ Rights defined as rights ‘arising from the past, present and future contributions of farmers in conserving, improving, and making available plant genetic resources, particularly those in the centres of origin/diversity’.25 In exchange for the moral recognition of farmers’ rights, their supporters accepted FAO Resolution 4/89, which recognized that plant breeders’ rights were not inconsistent with the IUPGR. The adoption of this agreed interpretation of the International Undertaking marked a turning point after which the principle of common heritage of mankind had lost its momentum.

As the controversy over the application of IPRs to crop diversity continued, with the proponents’ positions gaining on the common heritage principle of unrestricted access to all PGR, the developing countries asserted that the principle of permanent sovereignty over natural resources should take precedence over the former, as eventually agreed in FAO Resolution 3/91. Finally, in the negotiations of the UN

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24 On the principle of reciprocity see: CBD (2009), ‘Submission by the International Institute for Environment and Development (IIED) et al.—Information and views in preparation for the meeting of the Expert Group on traditional knowledge associated with genetic resources’, Answers to the questions posed to the Expert Group on TK associated with GR as specified in COP decision IX/12, Hyderabad, India (16–19 June 2009), at pp. 4–5.

25 Two years later, in FAO Resolution 3/91, countries expressed their moral and political commitment to implement farmers’ rights through the establishment of the International Fund for Plant Genetic Resources. However, this Fund did not receive much support as voluntary contributions fell short of expectations and it was never implemented. R. Andersen (2005), ‘The History of Farmers’ Rights—A Guide to Central Documents and Literature’, The Farmers’ Project—Background Study 1, The Fridtjof Nansens Institute, Lysaker, Norway.
Convention on Biological Diversity (CBD), they called for the explicit recognition that access to genetic resources be subject to national authority.

1.3.1.2 From common heritage to permanent sovereignty and the principle of common concern of humankind

During the negotiations of the CBD, countries firmly rejected the proposition that biological diversity should be treated as a common heritage of mankind. The reaffirmation of the principle of national sovereignty over natural resources, and the related idea that they shall be exploited in accordance with domestic environmental policies, contributed to the emergence of the principle of ‘common concern’ as the new paradigm of international environmental law after Rio. The application of the principle of common concern of humankind lays the foundation for defining states’ collective responsibilities to protect biodiversity by: conferring on them an *erga omnes* character; differentiating the degree of responsibility of developed and developing countries in accordance with their respective capabilities and their historical contribution to biodiversity loss; and requiring the use of the precautionary approach in carrying out potentially harmful activities.

The preamble of the CBD affirms that ‘the conservation of biological diversity is a common concern of humankind’. In the wake of the CBD, the preamble of the ITPGRFA also includes a lexicon, which conceives PGRFA as ‘a common concern of all countries, in that all countries depend very largely on PGRFA that originated elsewhere’. The principle of common concern ‘gives the international community of states … a legitimate interest in resources of global significance’ and it balances national sovereignty with the duties and responsibilities that derive from its exercise, pursuant to the global importance that is recognized to biodiversity and PGRFA.

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26 The Convention on Biological Diversity was adopted on 5 June 1992 and came into effect on 29 December 1993.
27 The principle of common concern of humankind globalizes international environmental obligations in the sense that for the first time it overcomes the paradigm, which conceived the latter as a system of norms that merely concern transboundary relations among states. P. Birnie and A. Boyle (2002), above note 21, p. 99.
28 Ibid.
1.3.1.3 The revision of the IUPGR and the adoption of the ITPGRFA

With the political controversy surrounding the realization of farmers’ rights firmly standing to catalyze the North–South divide over IPRs at the FAO and the whole set of principles regarding control over access to PGR shaken by the agreed interpretations of the International Undertaking, the time was finally ripe for the revision of this instrument.

In 1992, the Conference for the Adoption of the Agreed Text of the Convention on Biological Diversity had recognized that the regime developed under the CBD was not well suited to PGRFA and handed this issue over to the FAO.29 In November 1994, as a consequence of such a request from the CBD, the CGRFA started negotiations to bring the IUPGR into conformity with the CBD and, in particular, its benefit-sharing provisions. The mandate, which was established by FAO Conference Resolution 7/93, included: 1) the adaptation of the IUPGR in harmony with the CBD; 2) consideration of the issue of access on mutually agreed terms to plant genetic resources, including ex-situ collections not addressed by the CBD; and 3) the realization of farmers’ rights.

In 2001, this revision eventually came to an end. After seven years of negotiations, the FAO International Treaty on Plant Genetic Resources for Food and Agriculture was adopted by the FAO Conference on 3 November 2001.30 The latter is a legally binding international treaty, whose provisions fully reflect the compromise that was needed to preserve some elements of an open access regime in our times of private science through its multilateral benefit-sharing mechanism. The ITPGRFA provides an internationally agreed framework for the conservation and sustainable use of crop diversity and the fair and equitable sharing of benefits, in accordance with the CBD.31 This Treaty was specifically created to suit the needs of agriculture and plant breeding. In particular, it does not require ad hoc negotiations between providers and recipients of PGRFA and by doing that it reduces transaction costs. Thus, the Treaty facilitates access to PGRFA through the MLS and sets out specific ABS rules in the Standard Material Transfer Agreement (SMTA) that

29 Resolution No. 3 of the Nairobi Final Act of the Conference for the Adoption of the Agreed Text of the Convention on Biological Diversity, UNEP Headquarters, Nairobi, 22 May 1992.
30 The Treaty entered into force on 29 June 2004 and it has 119 contracting parties as of March 2009.
implements it. This mechanism ensures that some benefits flow back to the Multilateral System when a product based on MLS materials is commercialized on the market.

1.3.1.4 Differential treatment, international equity and North–South aspects of ABS

In most international environmental treaties, the elaboration of the principle of ‘common but differentiated responsibility’ contributes to address North–South divides through the normative recognition of their uneven degrees of responsibility in causing environmental problems and their different capacity to address them.32

The concept of benefit sharing under both the CBD and the ITPGRFA provides the basis for a normative differentiation between the obligations of developed and developing countries under these treaties. Their benefit-sharing objectives are a clear emanation of the principle of international equity in international environmental law. The concept of equity ‘is a direct emanation of the idea of justice’, which could be distinguished as a general principle of law from any other principle recognized by national or supranational legal systems.33 International equity has been further

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32 P. Birnie and A. Boyle (2002), above note 21, p. 81. In particular, Principle 7 of the Rio Declaration formulates the concept of ‘common but differentiated responsibilities’ as follows:

States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth’s ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command.


33 Case Concerning the Continental Shelf (Tunisia/Libyan Arab Jamahiriya), ICJ Reports (1982) 18 at 60, para. 71. Equity principles are an integral part of international law and can be applied regardless of the will of the parties in accordance with Article 38, para. 1 (c) of the Statute of the International Court of Justice, which provides that the ICJ decides the cases submitted to its jurisdiction in accordance with international law, comprising ‘the general principles of law’ recognized by civilised nations. On the one hand, Article 38, para. 2, states that that ICJ can decide ‘a case ex aequo et bono if the parties agree thereto’. The application of this provision has emphasized the use of non-legal principles of justice, morality, usefulness or common sense, which may not be related at all with
articulated into the concepts of ‘inter-generational equity’ and ‘intragenerational equity’. Under the CBD and the ITPGRFA, the concept of ‘intra-generational equity’ addresses inequity within the existing economic system by promoting the establishment of legal mechanisms under which developing countries are entitled to receive a ‘fair and equitable’ share of the benefits arising from the use of their genetic resources and associated TK.

judicial considerations. For instance, this concept may be defined as ‘the compendium of concepts supporting, promoting and implementing those entitlements, benefits and satisfactions which are validated by society’s contemporary sense of justice and fairness’. Such concepts operate ‘to temper the rigors of positive international law’s application to those specific situations where generalizations would produce anomalies, inequities, or injustice’ L.F.E. Goldie (1987), ‘Equity and the International Management of Transboundary Resources’, in A. Utton and L. Teclaff (eds), Transboundary Resource Law, London/Boulder: Westview Press, at p. 107. Thus, the decisions based on this provision are the result of a compromise reached in a procedure that is more akin to conciliation, rather than the arbitral or judicial settlement of a dispute based on equity as a general principle of international law.

For instance, the concept of inter-generational equity is enshrined in Principle 3 of the Rio Declaration, which states that: ‘the right to development must be fulfilled so as to equitably meet developmental and environmental needs of present and future generations’. While the rhetoric of ‘inter-generational equity’ has come a long way ‘from Stockholm to Rio de Janeiro to Johannesburg’, it does not seem to have promoted a great deal of international binding obligations and its practical implementation remains outstanding. At paras 3 and 4, the Johannesburg Declaration on Sustainable Development states:

... the children of the world spoke to us [the representatives of the peoples of the world] in a simple yet clear voice that the future belongs to them, and accordingly challenged all of us to ensure that through our actions they will inherit a world free of the indignity and indecency occasioned by poverty, environmental degradation and patterns of unsustainable development. As part of our response to these children, who represent our collective future, all of us, coming from every corner of the world, informed by different life experiences, are united and moved by a deeply felt sense that we urgently need to create a new and brighter world of hope.

UN (2002), ‘Johannesburg Declaration on Sustainable Development’, A/CONF.199/20, Report of the World Summit on Sustainable Development, Johannesburg, South Africa, 26 August–4 September 2002. Despite the difficulties to create enforceable rights for future indeterminate generations, this important moral obligation reminds us of our collective responsibility to sustainably use natural resources, in a way that does not compromise their quality and availability for the future, which is central to the idea of sustainable development.

See P. Birnie and A. Boyle (2002), above note 21, at p. 91. For instance, the Johannesburg Declaration on Sustainable Development states that poverty eradication, changing consumption and production patterns and protecting and
The rational for benefit sharing (as an international obligation that entails various forms of fair and equitable compensation, including through the provision of technology under most favourable or concessional terms) is the principle of international equity as a general principle of law recognized by civilized nations. For instance, the provisions on technology transfer of the CBD and the ITPGRFA state that ‘access to and transfer of technology’ to developing countries ‘shall be provided and/or facilitated under fair and most favourable terms, including on concessional and preferential terms where mutually agreed’.36

1.3.2 The relationship between the CBD and the ITPGRFA with particular regard to the legal principles underlying control over biological resources/PGR

The essence of the relationship between the CBD and the ITPGRFA can be understood by looking at the mandate for the negotiation of the latter. While the CBD embraces within its scope all the biological resources on earth, including PGRFA, it is essentially an environmental treaty. On the other hand the ITPGRFA provides an internationally agreed framework for the conservation and sustainable use of crop diversity and the fair and equitable sharing of the benefits arising from the use of such resources, in accordance with the CBD.37 Thus, the ITPGRFA has been specifically designed to suit the needs of agriculture and plant breeding. Within biological diversity, it defines a subset of resources of particular importance for agriculture and food security—i.e. PGRFA—and it limits the scope of application of its norms to them. In this respect, the ITPGRFA could be considered as a lex specialis for the agriculture sector, whereas the CBD provides the general environmental framework for the protection of biodiversity, whose principles have guided the development of the former.

managing the natural resource base for economic and social development are overarching objectives of and essential requirements for sustainable development’. The Political Declaration continues by reaffirming the commitments ‘to speedily increase access to such basic requirements as clean water, sanitation, adequate shelter, energy, health care, food security and the protection of biodiversity’ and to ‘... work together to help one another gain access to financial resources, benefit from the opening of markets, ensure capacity-building, use modern technology to bring about development and make sure that there is technology transfer, human resource development, education and training to banish underdevelopment forever’. UN (2002), above note 34, at paras 1 and 18.

36 Article 16.2 of the CBD and Article 13.2(b)(i) of the ITPGRFA.
The fundamental principle contained in Article 3 of the CBD clarifies that the obligations and commitments of contracting parties shall not be interpreted in a way that impinges upon their rights to exploit their biological resources pursuant to national policies, including the regulation of access to genetic resources and benefit sharing. In accordance with the above principle, Article 10 of the ITPGRFA states that ‘the Contracting Parties recognize the sovereign rights of States over their own [PGRFA], including that the authority to determine access to those resources rests with national governments and is subject to national legislation’. However, it also specifies that

in the exercise of their sovereign rights, the Contracting Parties agree to establish a multilateral system, which is efficient, effective, and transparent, both to facilitate access to [PGRFA], and to share, in a fair and equitable way, the benefits arising from the utilization of these resources, on a complementary and mutually reinforcing basis.

The practical modalities for the implementation of the principles that underlie control over genetic resources and PGRFA under these two treaties—and in particular, access to genetic resources and benefit sharing—are central to understanding their complementarity. In sum, the bilateral approach to ABS that characterizes the CBD is complemented by the multilateral approach of the ITPGRFA, which applies to the PGRFA that are listed in Annex I of that Treaty.

1.3.3 The concept of access to genetic resources/PGRFA as developed in the CBD and the ITPGRFA, including the principle of Prior Informed Consent

Under ‘Access to Genetic Resources’, Article 15.1 of the CBD specifies that ‘the authority to determine access to genetic resources rests with the national governments and is subject to national legislation’. This provision entails that national legislation identify those who might be

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38 Article 3 of the CBD provides that:

States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.
granted a right to share in the benefits arising from the use of genetic resources and from whom prior informed consent (PIC) needs to be obtained prior to their collection.39

While reaffirming the sovereign rights of states to their natural resources, Article 15 of the CBD regulates access to genetic resources by: stipulating that parties shall endeavour to facilitate access to genetic resources; providing that access shall be subject to PIC and granted on mutually agreed terms (MAT); and requesting parties to take measures to share benefits from the utilization of genetic resources on MAT.40

Article 15.4 of the CBD further provides that ‘access, where granted, shall be on mutually agreed terms …’. Therefore, the conclusion of an access agreement, including the MAT, envisages bilateral negotiations between the recipient of genetic resources and the providing party. Such negotiations are facilitated if an ABS focal point has been established in such country. Besides, the ABS focal point can be identified as the competent authority for granting PIC in accordance with Article 15.5 of the CBD, which states 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’.41

39 Unfortunately, the CBD does not give guidance on how to address the problem of the allocation of property interests/rights on the genetic resources that are under national sovereignty of contacting parties. Therefore, this matter has been regulated in different ways by different countries within a spectrum that goes from the complete inalienability of genetic resources, which may belong to the state under a regime of public property, to the allocation of private property rights or other interests to different stakeholders, who may control the intangible/informational contents of GRs, the tangible material and/or the area where the specimen is found. M.J. Cabrera and L.C. Silva (2007), Addressing the Problems of Access: Protecting Sources, While Giving Users Certainty, IUCN Environmental Policy and Law Paper No. 67/1, Gland, Switzerland: IUCN, at pp. 40–46.

40 Besides, the CBD Conference of the Parties (COP), at its sixth meeting, adopted the Bonn Guidelines on Access to Genetic Resources and the Fair and Equitable Sharing of the Benefits Arising from their Utilization (the Bonn Guidelines), a non-legally binding instrument that is ‘meant to assist Parties, Governments and other stakeholders when establishing legislative, administrative or policy measures on ABS and/or when negotiating contractual arrangements for access and benefit-sharing’. CBD COP Decision VI/24, April 2002, The Hague, the Netherlands and CBD Website, available at: www.cbd.int/doc/publications/cbd-bonn-gdls-en.pdf (accessed 7 March 2011).

41 As regards the establishment of a system of PIC, the Bonn Guidelines include provisions on: basic principles; key elements; competent authority(ies); timing and deadlines; specification of use; and procedures. An important aspect of PIC is the specification of use, since PIC
As highlighted above, the CBD promotes the development of a regime of contractual rules for the exchange of genetic resources that is based on bilateral contracts. However, the contractual approach of the CBD is inappropriate for genetic resources that have been widely shared across national borders, such as PGRFA. In such a case, it might be very difficult—if not impossible—to identify their country/ies of origin. Besides, the possibility of acquiring these materials from intermediaries or other sources without obtaining PIC means that potential users may in practice avoid undertaking to share the benefits arising from the use of such resources. In the case of crop diversity research, the transaction costs associated with bilateral ABS negotiations may be sufficient to discourage most plant-breeding efforts, as a high number of breeding materials from different sources are necessary to breed new plant varieties. Besides, while no country can be said to be self-sufficient in terms of plant genetic diversity, most countries—if not all—are enormously interdependent.

Part IV of the ITPGRFA establishes a Multilateral System that facilitates access to 64 important crops and forages to ensure worldwide food security. These pooled resources are available under the facilitated access mechanism of the MLS only if access is requested for the purpose of utilization and conservation for research, breeding and training for food and agriculture.

Under the Treaty, access to PGRFA included into the MLS does not require ad hoc negotiations between providers and recipients of PGRFA. Thus, this mechanism will reduce transaction costs in accordance with... should be based on the specific uses for which consent has been granted. While [PIC] may be granted initially for specific use(s), any change of use including transfer to third parties may require a new application for prior informed consent. Permitted uses should be clearly stipulated and further prior informed consent for changes or unforeseen uses should be required.

Ibid. para. 34 of the Bonn Guidelines. Other types of use restrictions for which PIC may be required are the restrictions on the users’ ability to obtain (or file applications for) IPRs over the genetic resources, associated TK and their derivatives, as well as commitments on the exclusivity of the access granted to a particular user. M.J. Cabrera and L.C. Silva (2007), above note 39, at pp. 12–13.

42 The conventional access agreements thus developed are called material transfer agreements (MTAs). Queen Mary Intellectual Property Research Institute et al. (2000), ‘Study on the Relationship between the Agreement on TRIPs and Biodiversity Related Issues’, Final Report, at pp. 54–74.

43 The species of included crops are listed in Annex I of the ITPGRFA.

44 This means that national ABS laws that are consonant with the CBD may apply if recipients intend to make use of PGRFA for other purposes, ‘such as chemical, pharmaceutical and/or other non-food/feed uses’. Article 12.3(a) of the ITPGRFA.
Article 12.3(b), which states that: ‘access shall be accorded expeditiously, without the need to track individual accessions and free of charge, or, when a fee is charged, it shall not exceed the minimal cost involved’. In particular, the tracking requirement of this provision needs to be interpreted in conjunction with Article 12.4, which envisages the use of standard material transfer agreements for any transfer of PGRFA within the MLS.\textsuperscript{45}

These provisions indicate that the ITPGRFA does not require a burdensome mechanism to track individual accessions, as providers of PGRFA do not have the obligation to keep track of all subsequent transfers of the material. However, the conclusion of SMTAs will be automatically recorded to ensure that some benefits flow back to the Multilateral System when a product based on MLS materials is commercialized on the market.\textsuperscript{46} Therefore, the SMTA is an important legal instrument, which may enable to follow the chain of transfers between individual providers and recipients of PGRFA.

1.3.4 The concept of benefit sharing under the CBD and the ITPGRFA

Under the CBD, the implementation of legal mechanisms to control access to generic resources and their subsequent use is inextricably linked with benefit sharing, as access restrictions usually provide the most powerful motivation to potential users for engaging in the negotiations of the MAT, including the form, amount and modalities for benefit sharing. In particular, Article 15.7 of the CBD states that

\begin{quote}
each Contracting Party shall take legislative, administrative or policy measures, as appropriate, … with the aim of sharing in a fair and equitable way the results
\end{quote}

\textsuperscript{45} Article 12.4 of the ITPGRFA states that:

facilitated access … shall be provided pursuant to a standard material transfer agreement, which shall … contain the … the benefit-sharing provisions set forth in Article 13.2(d)(i) and other relevant provisions of this Treaty, and the provision that the recipient of the [PGRFA] shall require that the conditions of the MTA shall apply to the transfer of [PGRFA] to another person or entity, as well as to any subsequent transfers of those [PGRFA].

\textsuperscript{46} Besides, in the case of non-compliance by recipients with the SMTA, the latter provides for binding international arbitration and confers upon the FAO so-called third party beneficiary’s rights to represent the interests of the Multilateral System. All the relevant ABS features of the ITPGRFA are explained in Chapter 4.
of research and development and the benefits arising from the commercial and other utilization of genetic resources with the Contracting Party providing such resources.

This provision further specifies that ‘such sharing shall be upon mutually agreed terms’, which ‘could cover the conditions, obligations, procedures, types, timing, distribution and mechanisms of benefits to be shared’.47

The benefit-sharing mechanism of the ITPGRFA differs from the CBD since benefits are shared on a multilateral basis in the MLS. Article 13.1 of the Treaty provides that facilitated access to PGRFA that are included in the Multilateral System constitutes itself a major benefit of the MLS. This Article also envisages four different tools through which benefits can be shared, namely: the exchange of information; access to and transfer of technology; capacity building; and the sharing of monetary and other benefits from commercialization. Besides, the Benefit-sharing Fund of the Treaty provides funding for the operationalization of the above tools to implement activities, ‘plans and programmes for farmers in developing countries, especially in least developed countries and in countries with economies in transitions, who conserve and sustainably utilize PGRFA’.48

In June 2006, with the adoption of the SMTA, the Governing Body of the ITPGRFA established the level, form and manner of mandatory payments to be made by users of PGRFA to the Benefit-sharing Fund of the Treaty.49 If certain legal requirements are met, compulsory benefit sharing of 1.1 per cent of incomes, which derive from the sale of seeds, must be paid by recipients to the Multilateral System.50 The first

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47 See paras 44 and 45 of the Bonn Guidelines. The Bonn Guidelines also specify an indicative list of typical MAT, which may comprise inter alia: type and quantity of genetic resources, and the geographical/ecological area of activity; limitations of use; capacity-building measures; renegotiations of terms under specified circumstances; third party transfers; references to TK aspects associated with the genetic resources; confidential information; and ‘provisions regarding the sharing of benefits arising from the commercial and other utilization of genetic resources and their derivatives and products’.

48 Article 18.5 of the ITPGRFA. Emphasis added.

49 Under the SMTA, recipients are free to transfer received materials to third parties without the need to seek the providers’ PIC. However, they must ensure that subsequent recipients are bound by the same benefit-sharing conditions. Thus, a chain of SMTAs ensures that benefit-sharing obligations are passed onto any ‘other person or entity’ that receives materials (e.g. seeds) derived from the Multilateral System.

requirement is that the commercialized ‘Product’ must incorporate ‘the Material’ received from the Multilateral System. The second requirement is that payments are due only if the ‘Product’ (i.e. seeds) is not freely available for further research and breeding. Thus, Article 6.7 of the SMTA not only seems to legitimize the patenting of seeds that incorporate materials accessed from the MLS, but also creates a strong link between benefit sharing and the patenting of biotechnological products and processes. To conclude, it seems that under the ITPGRFA and the CBD the existence of IPRs, which restrict access to a product based on genetic resources/PGRFA, is a precondition for the sharing of the monetary benefits arising from the commercialization of such a product.

Given that the development of a new plant variety may take more than ten years, during this period recipients are not normally required to make payments. Therefore, the SMTA also envisages an alternative payment scheme, which may provide an immediate flow of financial resources to the Benefit-sharing Fund. This is because it derogates to both requirements of Article 6.7 of the SMTA. In sum, the alternative payment scheme provides that recipients may voluntarily choose to make crop-based payments at the discounted rate of 0.5 per cent of the overall sales of seeds pertaining to the same crop species obtained from the MLS by the recipient.

51 The definition of ‘Product’ which is given in Article 2 of the SMTA excludes products other than PGRFA and other products used for food, feed and processing. Hence, the commercialization of bulk goods that are ‘sold or traded as commodities’ shall not be considered.

52 In essence, this requirement entails the existence of a patented product (legal restrictions) or restrictions deriving from particular technologies, such as Genetic Use Restriction Technologies (GURTs), or certain licensing practices.

53 Article 5(d) of the SMTA provides that intellectual and other property rights must be respected. However, interpretative problems may arise because the SMTA prohibits recipients to claim ‘any intellectual or other property rights that limit the facilitated access to the Material … or its genetic parts or components, in the form received from the Multilateral System’. Thus, it is questionable whether patent claims to the ‘material’, its ‘progeny’ and ‘unmodified derivatives’ should be allowed. This is because such claims can restrict access to germplasm, genome sequences and their functional characterizations, which ‘may be deemed to be international public goods’. R. Fears (2007), ‘Genomics and Genetic Resources for Food and Agriculture’, Background Study Paper No. 34, FAO, Rome, Italy.

54 Article 6.11 of the SMTA.
1.3.5 Farmers’ rights under the ITPGRFA

It is important to introduce the concept of Farmers’ Rights as they interact with most issues analysed in this book. While there is no agreed definition for farmers’ rights in international law, the Farmers’ Rights Project by the Fridtjof Nansen Institute has elaborated the following working definition:

Farmers’ Rights consist of customary rights that farmers have had as stewards of agrobiodiversity since the dawn of agriculture to save, grow, share, develop and maintain plant varieties, of their legitimate right to be rewarded and supported for their contribution to the global pool of genetic resources as well as to the development of commercial varieties of plants, and to participate in decision making on issues that affect these rights.55

This definition is based on Article 9 of the ITPGRFA, which recognises:

… the enormous contribution that the local and indigenous communities and farmers of all regions of the world, particularly those in the centres of origin and crop diversity, have made and will continue to make for the conservation and development of [PGR] which constitute the basis of food and agriculture production throughout the world.

Article 9 provides that ‘the responsibility for realizing Farmers’ Rights, as they relate to PGRFA, rests with national governments’ and specifies three possible elements of these rights, namely: the protection of traditional knowledge relevant to PGRFA; the right to equitably participate in sharing benefits arising from the utilization of such resources; and the right to participate in making decisions on matters related to the conservation and sustainable use of PGRFA. Finally, it states that ‘nothing in this Article shall be interpreted to limit any rights that farmers have to save, use, exchange and sell farm-saved seed/propagating material’. Thus, all the above elements constitute a bundle of rights, which states can confer upon the farmers to preserve and promote their traditional practices, knowledge and innovation that help conserving and developing crop diversity.

1.4 THE COMMODIFICATION OF CROP DIVERSITY

Three global trends are shaping a new complex institutional environment within the paradigm of a privatized science, which has remarkable implications for agricultural research and plant breeding.56 First, in 1994, the successful conclusion of the Uruguay Round of trade negotiations led to the integration of world markets into the World Trade Organization (WTO) framework, developing countries included. Second, the strengthening of uniform market conditions for trade and investment fostered the emergence of a highly concentrated private sector as a major player in creating and commercializing biotechnological inventions and proprietary research tools. Third, over the last 30 years radical changes have occurred in the legal framework that applies to the exchange and use of genetic resources.57

Since the adoption of the Brundtland Report by the World Commission on Environment and Development in 1987, the idea of sustainable development has conveyed the fundamental lesson that ‘the world’s environment and its economy are so closely linked that policies in one area that ignore the other are bound to failure’.58 The concepts of ‘inter’ and ‘intra-generational equity’, the principles of ‘common but differentiated responsibilities’ and ‘common concern’, as developed in the Rio and Johannesburg Declarations, have become essential elements of sustainable development.

The imperatives of economic growth, including industrial food production, and biodiversity conservation have dramatically influenced PGR laws and policies. Nevertheless, sustainability principles have been

57 ‘In recent years the CGIAR’s activities have been increasingly conditioned by a rapidly changing intellectual property rights environment and the issue of Farmers’ Rights.’ See the ‘Guiding Principles for the Consultative Group on International Agricultural Research Centres on Intellectual Property and Genetic Resources’, Washington DC 1996, in SGRP (2003), Booklet of the CGIAR Centre Policy Instruments, Guidelines and Statements on Genetic Resources, Biotechnology and Intellectual Property Rights, Version II.
largely ignored as the commodification of crop diversity has prevailed over the need to promote diversified seed systems to preserve diversity in agriculture and in people's diet.\(^59\)

However, there seems to be an increasing awareness of the potential problems arising from the commodification of crop diversity. The UN Special Rapporteur on the Right to Food has recently expressed concerns about corporate marketing practices and corporate lobbying that are contributing directly both to forms of malnutrition and forms of obesity. … Industry lobbying … has increasingly become stronger in those forums where standards aimed at contributing to the protection of the right to food are discussed and adopted.\(^60\)

In relation to the impact of trade agreements on global food security, the lack of clarity as to the links between intellectual property policy-making, biodiplomacy and sustainable agricultural development is a crucial problem.\(^61\) In the related field of medical biotechnology, the argument that has persuaded policy-makers to enact the first permanent amendment to the WTO Agreement on Trade-Related Aspects of Intellectual Property, Agriculture and Global Food Security

\(^{59}\) On the differences between formal and informal systems of seed provision see below section 2.2.5 and N.P. Louwaars (2007), 'Seeds of Confusion: The Impact of Policies on Seed Systems' (Wageningen University), at pp. 7–8. The author argues that:

Current seed laws and IPRs cater for the needs of a relatively small segment of the total seed supply sector. … Legislation based on disconnected and inconsistent policies lead to problems with implementation, to confusion, and—in the field of genetic resources and seeds—to juridification and 'hyperownership' when proponents of national, communal or individual rights systems are caught in an increasingly dense thicket of rights.

\(^{60}\) UN (2007), ‘Report of the Special Rapporteur on the Right to Food’, A/62/289, by Jean Ziegler (22 August 2007), at paras 9 and 64(b). In particular, he has recommended that ‘all States should ensure that their international political and economic policies, including international trade agreements, do not have a negative impact on the right to food in other countries’.

\(^{61}\) G. Winter, for instance, argues that patent law policies should focus on the question of ‘the benefits and desirability of scientific and technical progress’, including not only the competitiveness of the economy, but also the environmental and social implication of technological change. A regards the agricultural sector, the author adds that risk factors increase when high-yielding varieties ‘are employed on the basis of agricultural methods which seeking economies of scale prefer monoculture’. G. Winter (1992), ‘Patent Law Policy in Biotechnology’, *Journal of Environmental Law*, 4(2), 167–87; See also G. Tansey and T. Rajotte (eds) (2007), above note 15.
Introduction and overview

Intellectual Property Rights (the TRIPs Agreement)—to allow compulsory licences for exports of generic medicines to countries with no manufacturing capacity—is based on evidence that shows that patent protection may seriously impinge on the effective possibility to have access to life-saving drugs at affordable prices.62

By contrast, food security concerns are largely decoupled from issues of access to PGRFA and IPR protection. For instance, while the European Parliament expressed ‘concern about the consequences of higher rice prices, particularly for poorer households in rice-importing ASEAN countries’, this statement does not have the prescriptive strength of the European commitment on access to medicines, which should prevent the introduction of drugs-related TRIPs-plus standards into the EU-ASEAN FTA.63

Notwithstanding the increasing awareness of the potential problems that derive from restrictions on access to PGRFA, including their impact on the provision of international public goods, which contribute to food security and pro-poor agricultural research, countries have not

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62 C. Pérez-Casas (2000), ‘HIV/AIDS Medicines Pricing Report. Setting Objectives: Is There a Political Will?’ Campaign for Access to Essential Medicines and Médecins Sans Frontières. This report ‘compares institutional prices of 10 essential drugs for HIV/AIDS in 8 countries and examines the effect on prices of generic availability and patent status’. See also: WTO (2003), ‘Implementation of Paragraph 6 of the Doha Declaration on the TRIPs Agreement and Public Health—Decision of 30 August 2003’, WT/L/540, WTO, Geneva; and D. Matthews (2006), ‘From the August 30, 2003 WTO Decision to the December 6, 2005 Agreement on an Amendment to TRIPS: Improving Access to Medicines in Developing Countries?’, Intellectual Property Quarterly, 10, 91–130. To some extent, public health concerns have been reflected in the international legal regulatory framework to preserve access to medicines, including by preventing that IPRs-related flexibilities, which are agreed at the WTO level, are restricted through bilateral or regional agreements. However, this seems to be an exception rather than the general rule. In negotiating a free trade agreement with the ASEAN countries, the European Parliament pointed out ‘that nothing in the agreement should create legal or practical obstacles to the maximum use of flexibilities set out in the Declaration amending the … TRIPs Agreement and access to medicines’, and recalled ‘the EU commitment to support the Doha Declaration and the use of TRIPs flexibilities in favour of public health and of access to medicines in developing countries’. European Parliament (2008), ‘European Parliament resolution of 8 May 2008 on Trade and Economic Relations with the Association of East Asian Nations (ASEAN)’, A6–0151/2008/P6_TA-PROV(2008)0195, Brussels (8 May 2008), at paras 13–14.

63 Ibid. at para. 17.
consistently responded with legislation to address these problems at the multilateral, regional and national levels.\textsuperscript{64}

1.5 LEGAL, TEMPORAL AND GEOGRAPHICAL SCOPE AND LIMITATIONS

As mentioned at the outset, the subject matter of this book is the study of legislations and related law-making processes that concern the commodification of crop diversity, in particular, the adoption, harmonization and implementation of laws, including international law instruments, that determine the allocation of legal entitlements to manage and control plant genetic resources, their derivatives and the benefits thereof. The focus on ownership regulation derives from the paramount importance that both the design and allocation of rights in plant genetic resources might have for global food security.

This book considers two specific sets of policies and legal instruments that are not being addressed in mainstream discussions about food security, and it intends to fill this gap. Therefore, its scope is limited to private exclusion rights, such as patents and plant variety rights, as well as state ownership, government regulation and private contracts, which arise primarily from the implementation of the access and benefit-sharing pillar of the UN Convention on Biological Diversity.

This book also discusses the issue of farmers’ rights as they relate to crop genetic resources under the ITPGRFA. In particular, attention is devoted to the analysis of the legal provisions and mechanisms concerning the recognition of the rights that indigenous and local communities and farmers have to participate in benefit sharing and

\textsuperscript{64} The FAO ITPGRFA is the most remarkable exceptions to this trend. Besides, general efforts are underway in the context of the WIPO Development Agenda to ensure that ‘WIPO’s norm-setting activities’ are ‘supportive of the development goals agreed within the UN system, including those contained in the Millennium Declaration’. In particular, under Recommendation No. 22:

The WIPO Secretariat … should address in its working documents for norm-setting activities … issues such as: (a) safeguarding national implementation of intellectual property rules (b) links between intellectual property and competition (c) intellectual property-related transfer of technology (d) potential flexibilities, exceptions and limitations for Member States and (e) the possibility of additional special provisions for developing countries and LDCs.

decision making, and to provide access to their PGRFA-related traditional knowledge in accordance with PIC and MAT.

The North–South dimension of international law-making processes relevant for the protection of crop diversity will provide a useful background to understand relevant treaties. However, such dimension is not further analysed because this book focuses on positive law and on the discussion of how the law can be improved for international equity and sustainability.

Seed legislation, which plays an important role in the development of seed systems, is not covered by this book, because neither does it regulate the ownership of PGR nor is its implementation at the national level driven by developments at the international level. Similarly biosafety legislation, which regulates the approval and commercialization of transgenic seeds, is outside the scope of this study because it does not influence the assignment of legal entitlements to control PGR. Finally, relevant legal and policy instruments are analysed here as a matter of economic and sustainable development policy rather than from the standpoint of bioethics.65

In theory, future negotiating outcomes from World Intellectual Property Organization (WIPO) discussions on genetic resources both in the Intergovernmental Committee (IGC) on Intellectual Property, Genetic Resources, Traditional Knowledge and Folklore and in the context of Substantive Patent Law Treaty (SPLT) negotiations could be relevant for crop diversity.66 However, such negotiating processes are outside the scope of the book because the above WIPO bodies have not yet adopted binding IP protection standards applicable to member states.

The temporal scope of this study spans from the advent of plant-related IP in the US during the early twentieth century up to the analysis of present-day law-making processes. In terms of geographical scope,
particular attention is paid to international law due to the global dimension of food security concerns. However, this study covers developments at various levels, including: national, bilateral, and multilateral instruments. Selected national and regional experiences are analysed. The plant-related IP laws of the European Union and the US are studied because of these countries’ influential status as trade partners, technology and technical assistance providers, and for their continuing importance as legislative models for the drafting of international norms.

The case study of Viet Nam receives particular attention in Chapter 5. This is because Viet Nam has undergone a profound modernization of its economic and legal systems, which has remarkable implications for the regulation of crop diversity. Therefore, it exemplifies the potential outcome of the national implementation of international norms through the interaction between public and private actors, including technical assistance providers. In Viet Nam, the study of the transition between property regimes provides the scope to investigate the extent of the capacity deficit that needs to be matched to deliver appropriate assistance in the implementation of global institutional reforms governing the present and future allocation of wealth from crop diversity.

1.6 OUTLINE OF THE BOOK

Following this introduction, Chapter 2, *Patents, Agricultural Innovation and Sustainable Development*, provides a critical analysis of mainstream normative approaches to the privatisation of crop diversity and challenges the assumption that the internalisation of externalities from plant breeding and biotechnology is the panacea to fostering private investments in agricultural research. In particular, it examines the economic theories that have been used to justify the function of the patent system and places the current debate about the optimum scope of IP protection within the broader theoretical discussions concerning the question of how innovation can promote agricultural development.

Since the legal history of the commodification of crop diversity and the scientific history of the life sciences go hand in hand, this chapter also presents the fundamental steps of the transition from traditional plant breeding to modern agricultural biotechnology.67 Finally, it considers the nature of PGRFA and tests the proposition that they are ‘non-traditional infrastructural resources’, which form part of the technological infrastructure that underpins agricultural research. Against this backdrop,

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67 On the reasons why technology matters see section 2.3.
it highlights the fact that strong economic arguments exist, which point to the conclusion that PGRFA should be managed in an openly accessible manner, because they can generate high social value and positive externalities in the form of public goods.

Chapters 3 and 4 provide the legal and historical background and describe the evolution of the international legal framework that is applicable to the management of PGRFA. They introduce the relevant international agreements and associated negotiating processes: in particular, those that have taken place within four multilateral institutions. Such institutions are: the World Trade Organization, the Union for the Protection of New Plant Varieties (UPOV); the Conference of the Parties of the Convention on Biological Diversity; and the Food and Agriculture Organization of the United Nations.

The resulting agreements constitute what Raustiala and Victor have termed the *Regime Complex for Plant Genetic Resources*. The history of the progressive expansion of exclusion rights in PGR, including both ‘patent-based’ and ‘sovereign-based systems of ownership’, reflects the development of this regime complex.

Thus, the understanding of the applicable international legal framework is a fundamental step, which is necessary to appreciate its cumulative effects on the acquisition and management of science and technology relevant for plant breeding and agriculture, including the use of genetic materials and their ‘bio-informational’ contents. Such understanding is also important not to disregard crucial equity issues that may be associated with such uses and to assess the effective margin for manoeuvre that governments might have to comply with international obligations and standards, while promoting their national interests in agriculture and crop improvement.

68 In particular, they argue that all such agreements: contribute to define some elements of the regime; partially overlap in scope, subject matter, and time; and have no clear hierarchical order to solve potential conflicts of norms between them. K. Raustiala and D.G. Victor (2004), ‘The Regime Complex for Plant Genetic Resources’, *International Organization*, spring 2004.


70 P. Bronwyn notes that ‘It is particularly important to understand how this new (resource) economy (in bio-information) will operate, as it has the capacity to create not only new dynamics of biological-resource exploitation but, more importantly, new geographies of justice and injustice.’ P. Bronwyn (2004), *Trading the Genome: Investigating the Commodification of Bio-Information*, New York: Columbia University Press, at p. xx of the preface.
The relevant agreements, which are analysed in this book, may differ markedly in nature, scope and objectives. However, in broad terms, they can be distinguished between IPR-related agreements and biodiversity-related agreements, in accordance with their principal subject matter.

On the one hand, the first category of agreements includes: 1) the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights; 2) the Acts of the Union for the Protection of New Plant Varieties; and 3) bilateral and multilateral free trade and investment agreements, which expressly provide for so-called TRIPs-plus standards. Chapter 3, Plant Intellectual Property Protection: Patents and Plant Variety Rights, focuses on the above IPR-related agreements and explains the substantive patent standards relevant for the protection of genetic resources, as well as the possible overlap between biotechnological patents and plant variety rights at the national level.

On the other hand, the UN Convention on Biological Diversity and the FAO International Treaty prominently figure in the second category. In addition, other international instruments pertain to the same group, such as the FAO International Undertaking on Plant Genetic Resources (IUPGR), and the Agreements between FAO and the Centres of the Consultative Group on International Agricultural Research (CGIAR).

Chapter 4, The International Legal Framework of Access to Plant Genetic Resources and Benefit Sharing, presents the relevant biodiversity-related instruments and associated negotiating processes. In particular, it focuses on their potential impact on the ownership and use of PGRFA in agricultural research and plant breeding, including relevant aspects concerning the protection of farmers’ rights and PGRFA-related traditional knowledge under the ITPGRFA. After having introduced the ITPGRFA and explained the coverage of its Multilateral System, this chapter focuses on the provisions of the Standard Material Transfer Agreement. In particular, it considers the links between its benefit-sharing provisions and the treatment of IPRs, which is important to understand the extent to which the ITPGRFA can make a contribution to international equity through benefit sharing.

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71 In theory, future negotiating outcomes from WIPO discussions on genetic resources both in the IGC and in the context of Substantive Patent Law Treaty (SPLT) negotiations on the harmonization of substantive legal standards relevant to biotechnology could also be included in this category of agreements.

72 CBD, Joint Web Site of the Biodiversity Related Conventions, available at: www.cbd.int/cooperation/joint.shtml (accessed on 10 April 2008). Biodiversity-related conventions are a subset of so-called multilateral environmental agreements (MEAs).
Finally, with the recent adoption of the ‘Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization’ to fulfil the third objective of the Convention on Biological Diversity, the relationship between the former and the ITPGRFA and assesses the extent to which the Protocol ‘could be in harmony and mutually supportive of the mandates of and coexist alongside … the ITPGRFA’.

In the face of concerns regarding food security, genetic erosion, and the need to provide equitable accesses to seeds and strengthen the domestic plant-breeding sector, Chapter 5 presents a case study on The Regulation of Crop Diversity in Viet Nam. This case study describes relevant national legislative processes and their outcomes, and analyses the effectiveness and limitations of such reform processes in the area of PGR.

Viet Nam is one of the richest countries in the world in terms of agro-biodiversity and the most important source of income is agriculture, which employs two-thirds of the population. The do moi reform process, which began in the mid-1980s, has greatly contributed to a shift from subsistence farming to commercial agriculture. Thus, the country has an economy in transition, which has undergone deep economic and legislative changes to modernize its national innovation and trading system. As part of this process, it has recently acceded to both the WTO and the UPOV Convention.

The Biodiversity Law, which was passed in November 2008, is meant to reorganize all national legal environmental instruments related to biodiversity protection, including access to genetic resources and benefit sharing. With the Law’s entry into force in July 2009, its implementing
provisions will have an impact on domestic and transnational agricultural research, because these activities will need to comply with national ABS standards and procedures.

Viet Nam is also a member of the FAO Commission on Genetic Resources for Food and Agriculture. While the country has not yet ratified the ITPGRFA, the Government of Viet Nam is currently considering this, and has expressed its interest in becoming a party. Against this backdrop, there is a concern that the Biodiversity Law should possibly provide the scope to implement the ITPGRFA in the future.

Viet Nam has received a great deal of development and trade-related technical assistance. This makes it an interesting laboratory to observe how the interests, priorities and goals of different actors have played out in shaping the outcomes of the described law-reform processes. In sum, the case study of Viet Nam shows that such reform processes neither have recognized the need to afford a special treatment to PGRFA nor have strengthened the important role that informal seed systems still play in the country. Besides, it explains why this course of action has taken place as the result of tensions between IPR and ABS policies, interest group activities, and the interaction between public and private actors, including the role of technical assistance and the negotiation of free trade and investment agreements. Finally, it draws some lessons learnt, conclusions and recommendations.

Chapter 6 concludes that global institutional reforms, that govern the present and future allocation of wealth from crop diversity, disregard the important role of informal seed systems and, therefore, they are insufficient—and in some respects inappropriate—to achieve international equity in terms of the way PGR are transferred, how agricultural research is conducted and its benefits shared. It also suggests ways forward to improve existing legal instruments and benefit-sharing mechanisms to facilitate access to agricultural knowledge, science and technology for sustainable agricultural development, and draws key lessons learnt for the developing countries.