

This is a chapter from my PhD, finished in 2009, which in its outline corresponds closely to my presentation. While I have been writing on these themes ever since, the project wherein this chapter is rewritten into article format is not yet ready. The full references can be found in the PhD, which is available at <http://dare.ubvu.vu.nl/handle/1871/15441>

Chapter Four – Gene Regimes (by Eric Deibel)

“the Concern I had been in for my own Preservation had taken off the Edge of my Invention for my own Conveniences; and I had dropp’d a good Design, which I had once bent my Thoughts too much upon; and that was, to try if I could not make some of my Barley into Malt, and then try to brew myself some Beer: This was a really whimsical Thought, and I reprov’d my self often for the Simplicity of it; for I presently saw there would be the want of several things necessary”

Daniel Defoe – *Robinson Crusoe* ([1719] 2007: 142)

Introduction

The quote above from Daniel Defoe’s *Robinson Crusoe* shows a tragedy that is different than the one about a man stranded on an isolated tropical island. What is a tragedy is that after many years of working on crop improvement and fermentation Crusoe loses his edge when he becomes too preoccupied with defending his life and the possessions that he needed for his survival.

This chapter is about a similar predicament – it describes a tragedy that is analogous to how Crusoe survives decades left to himself after his shipwreck by getting involved in breeding and brewing until the day he finds a footstep in the sand. It is only a footstep, as he puts it, that took the ‘edge’ off his inventions. He repeats several times that it is ‘*on the account of the Print of a Man’s foot*’ that he leaves behind his earlier designs (see Defoe 2007: 130-132). Henceforth it is not innovation for his own convenience but his ‘own Preservation’ that preoccupies him, which is to say that he abandons his efforts and instead works on his defenses against the savages that might come to his island. The novel describes in detail how Crusoe begins to plant rings of trees in hedges that become so thick and strong that they are like walls of fortifications wherein he could hide himself and enclose himself, his cattle and his crops – ‘as if no Accident could intervene’. He admits to himself that this ‘Wall I was many a weary Month a finishing, and yet never thought my self safe till it was done’ (ibid: 136, 137).

This is a theme that is familiar to contemporary studies of intellectual property; how Crusoe gets preoccupied with building enclosures echoes the focus of many critical studies on the strengthening and proliferation of intellectual properties over the last three decades. He is building enclosures rather than inventing, which almost literally resembles how James Boyle refers to a ‘second enclosure movement’ and how Christopher May wrote of the ‘new enclosures’ (May 2000; Boyle 2003a). The main difference, however, is that their historical reference point is not a solitary plant breeder – a ‘*would-be-barley inventor*’ that would have wanted to make crop improvements but cannot. The tragedy that they use to investigate intellectual property is the fencing off of common lands in early-modern England. This fencing off is then considered as historically appropriate by comparison with a parallel enclosure

of an ‘intellectual commons’ – either by a metaphorical or by a literal analogy with a negative estimation of the social impacts of the enclosure of the pre-modern commons (see chapter one). By contrast Crusoe is no hero of the commons – how could he be since he chooses to make his own enclosures and to leave behind his inventions because he is too concerned about his security?

Moreover, it is not enclosure that made Crusoe give up on his ambitions as a breeder/inventor. Unlike the ‘enclosure moment’ that fenced off the commons and forced off the commoners, it is only a footstep that makes Crusoe give up his inventions. When Crusoe realizes that his island was accessible by others, he becomes too preoccupied with terror to invent. In other words, it is access that causes his insecurity, which in most studies of intellectual property would be considered to imply in line with Garrett Hardin’s “tragedy of the commons”. Its dictum prescribes that ‘freedom in a commons brings ruin to all’, which is to say that when too many people have access to the commons this is a recipe for disaster (see Hardin 1968). Crusoe, however, does not at all resemble Hardin’s herdsmen that let too much cattle onto the common land, since his problem is not that the common land is overgrazed until nothing is left and neither is it about the depletion of fish stocks, over-population or the pollution of the atmosphere and oceans.

Crusoe’s preoccupation with his survival has very little to do with the plunder of the commons – it is a tragedy only in the sense that he has to give up the inventive-efforts that preoccupied him for two decades on an island by himself. Such a predicament neither illustrates an enclosure of the commons nor does it illustrate a tragedy of the commons and it also differs from the liberal myth of the individual genius. Most strikingly the enclosures that he builds are of no use to a contemporary protagonist of enclosure who advocates that innovation requires more and stronger intellectual property incentives. Obviously Crusoe invented without any intellectual property incentives and neither do his enclosures help with his designs. Furthermore he did not continue because he was interrupted by a footstep – his terror is the consequence of the accessibility of his island. This makes him unsuitable also as the main character for the opposite perspective: the so-called ‘tragedy of the anti-commons’, which is the most popular commons-metaphor in intellectual property studies. There is a tragedy of the anti-commons (as mentioned in earlier chapters) when there are too much property rights and too many different types that obstruct the usage of a resource; in the case of intellectual properties this is about how innovations slow down when too many permissions are necessary (see Heller 1998; Heller & Eisenberg 1998).ⁱ

The anti-commons tragedy has become so popular that it is increasingly considered self-evident that there is too little access to crop materials and that there are too many enclosures that obstruct the necessary innovation in plant breeding and plant biotechnology. What the tragedy of Crusoe the ‘barley-inventor’ shows, however, is that access sets in motion the events that make him give up innovation. His

plant breeding is interrupted by access – by a footstep that shows that his island is accessible and that makes him too preoccupied to continue his innovations. This sequence of events is particularly illustrative for contemporary plant breeding. In brief, how Crusoe loses his edge to his crop improvements shows that it is a false dilemma to consider food security in terms of a choice between enclosure and access (to escape either the tragedy of the commons or the tragedy of the anti-commons); instead it is a triangle of (1) a footstep (access), (2) fear for his life and possessions because of the savages (insecurity) and (3) planting hedges for protection (enclosure).

This triangle makes Crusoe into a most appropriate main character whereby to critically reconsider the great importance that is attributed to inventiveness today in the necessary measures to overcome the catastrophes that threaten the world. Only a footstep set in motion the insecurities that led Crusoe to abandon his crop improvements; only the court ruling (the one that made law the oxymoron that living organisms once modified are no longer free to all men as manifestations of nature) set in motion the many types of enclosures and access that are there and that are under preparation. Like the points of the triangle, access and enclosure are modern innovation myths that are selectively made operational in close relation to a range of insecurities – like climate change and, not so long ago, the rapid loss of the crop diversity of practically all crops in the world.

This is also what the title calls ‘gene regimes’ – the balancing act of access arrangements and intellectual property protections as a tragedy that is similar to how Crusoe lost his edge. Throughout this chapter references will be made to the analogy with Robinson Crusoe that make specific how insecurity gets mobilized in the access arrangements and protections on crop *genetic* diversity. This is a problem because it again shows how the edge to invention is lost because of a mere footstep; the legal process that was set in motion by the Chakrabaty patent regulates crop genetic material as if it were the basic material for biologists and biotechnologists to save ‘island earth’. A footstep set in motion a tragedy for those that live and work with crop diversity and that are considered the victims of catastrophe. These catastrophes are mobilized in such a way that even more access and more enclosures become necessary.

The first section will discuss the various international treaties that aim to regulate plant genetic materials and plant breeding. It elaborates on the different types of intellectual property protections, state jurisdictions and access arrangements. The second section will discuss the arrangement of access to sophisticated biotechnologies under development and intellectual property reforms get presented as humanitarian measures. It argues that such measures are constrained within a juridical framework that is focused on further liberalization of trade. In brief, the on-going legal process enables access to crop genetic material and intellectual property reforms in order to make possible further ‘access to markets’. This is a tragedy especially when considered as a near identical predicament as that of Robinson Crusoe

in the seventeenth century who remained convinced about his innovations that were it not for ‘the terror’ he was in, he would have ‘undertaken it, and perhaps brought it to pass too’ (Defoe 2007: 142).

One: intellectual property and access

1.

Crusoe on his island was one of the farmers that each year selects and saves the seed from the plants in a harvest, those that show the most desirable traits. Of course, Crusoe did not reach what he had in mind – which was to use his barley to brew beer – because he was interrupted by a footstep; however his attempts do illustrate another aspect that is important for global crop diversity. He had salvaged some of his barley from the ship taking it to a tropical island where there was none. This makes his tale an illustration of the many instances that make up the free flow of plant genetic material across the world since the beginning of agriculture.

While over thousands of years there has been a slow but steady accumulation of crop varieties and traits to which farmers continue to contribute in many places in the world, the free flow of these crop materials has notably changed in the twentieth century (see Brush 2005a: 64). So much so that it was considered useful to begin the opening statement of the 1983 treaty the ‘international undertaking on plant genetic resources’ by announcing that it was in accordance with:

‘universally accepted principles that plant genetic resources are a heritage of mankind and consequently should be available without restriction’.ⁱⁱ

This is the only international treaty to have made this claim. Even though it states that it is in accordance with a universally accepted principle, there was very little universal acceptance of the statement. From the moment of its ratification it was surrounded with controversy. This is the only international treaty to have made this claim. Even though it states that it is in accordance with a universally accepted principle, there was very little universal acceptance of the statement. From the moment of its ratification it was surrounded with controversy.

Although the treaty entered into force with the support of many developing and a small number of western countries, others like the United States had objections to the suggestion of plant genetic resources that had to be available ‘without restriction’. It was considered too controversial for international law to designate genetic materials as a resource freely available as a ‘common heritage of mankind’. This concept implies that plant material would become regulated in a way that allows it to remain freely available for use, which would not only cover its availability for scientific research but

also the usage of crop genetic materials in farmers' fields. In other words, it aimed to affirm the historical conditions that resulted in crop diversity such as the open access to crops and non-exclusion from growing crop varieties – as continues to be the norm for farmers in many places around the world. No matter how much it is the norm in farmers' fields, however, the concept is simultaneously quite a provocation in an international treaty as it confirms 'availability free of national sovereignty or private property, management for the benefit of mankind as a whole, exclusive use for peaceful purposes by all states, and free and openly accessible to scientific research' (Gepts 2004: 1295). Furthermore such freedom from private property and sovereignty was already 'historical' at the time. There were already 'plant variety rights' and 'plant breeders' rights' that had been introduced to conventional plant breeding in the mid-twentieth century.

Despite such antecedents, however, it is remarkable how only a couple of years were needed after patentability was extended by the U.S. supreme court decision in the early eighties to persuasively sideline the idea that crop genetic materials were a common heritage in international law. Within a decade after it had been declared that genetic materials were no longer to be 'free to all men and reserved exclusively to none', various private property and sovereignty arrangements had been introduced to international law for the purpose of regulating plant genetic material (see Parry 2004: 85, 86). A provision was added to the Undertaking of the FAO in 1991 that emphasized that there is no incompatibility between plant breeding and the conservation of crop diversity. It made explicit that it is within government jurisdictions that the free exchange of materials can be restricted to conform to its national and international obligations (Brush 2005a: 86).ⁱⁱⁱ

Furthermore, a year later an even more substantive system for the management of genetic materials as national sovereignties was put in place with the Convention on Biodiversity (CBD). The general definition of genetic materials in the CBD refers to 'any material of plant, animal, microbial or other origin containing functional units of heredity of actual or potential value'. This covers crop diversity as well and the CBD specifically refers to the conservation of genetic materials as a 'common concern' rather than a common heritage of mankind (CBD Art 2). The basic assumption of the CBD is that it is necessary to replace the quick financial returns on the destruction of biodiversity with economic incentives that would allow governments to focus on its conservation. At the time of the conclusion of the CBD in the early nineties, pharmaceutical and agricultural biotechnologies were already being patented in many places and an international agreement on intellectual property was under preparation. Article 27 of the 1994 agreement on Trade Related aspects to Intellectual Property rights (TRIPs) – part of the Uruguay Round of General Agreements on Trades and Tariffs (GATT) – legislates for the international level what 'may' be excluded from patent provisions. It is phrased in a typically juridical

way that makes very explicit that nothing rules out that governments have the authority to expand the number of subject matters that are patentable. The article mentions diagnostics, therapeutics and surgical methods as well as plants and animals and ‘essentially’ biological processes for their production.^{iv}

Consequently the TRIPs agreement does not make the patentability of genetic material mandatory but makes it optional. This is an option, however, with notable effects on the legislation of plant breeding. A 1991 amendment had then already been made to the agreement of the International Union for the Protection of New Varieties of Plant (UPOV).^v In UPOV the ‘double protection’ of a plant variety was no longer forbidden (Art. 35 (2)). Like patentability in TRIPs, double protection is not a requirement in UPOV 1991. The trick, however, is in how TRIPs Article 27 requires that plant varieties are protected – either by TRIPs, UPOV or otherwise. While patenting is optional, TRIPs makes it obligatory that plant varieties are protected, which, in turn, requires governments that are a member of the WTO to introduce so-called plant variety rights, also called breeders’ rights.^{vi}

Lastly, most governments have chosen to ratify either UPOV78 or UPOV91 but it should be clear that plant variety protection is not only important for conventional breeders – such an incentive also applies to new and improved crops that have been genetically modified. Genetic modification (GM) is not an alternative to plant breeding – GM does not work unless incorporated in a conventionally improved variety. This is one of the principle reasons for chemical and pharmaceutical corporations to enter into the field of crop breeding and that a handful Ag-biotech multinationals now control most seed companies. For them the “double protection” clause for plant varieties of UPOV91 and the obligation to protect plant varieties in TRIPs were economic incentives, not for the plant breeders or farmers who cultivate conventional varieties.

2.

The double protection clause has created some friction between patents and variety rights because a patent can potentially cover many protected varieties while there is the so-called ‘breeders’ exemption’ that aims to guarantee access to protected varieties.

Even the most competitive high yielding conventional varieties that required great investments can be crossed without permission of another breeder while in the case of varieties that are patented, the owner of the patent has the right to decide. The access to varieties discourages monopoly breeding lines as well as the possibility that many different claims would apply to a new crop species with a combination of traits that are based on various other protected varieties. As a consequence of the

breeders' exemption a wider range of genetic diversity can be incorporated into a variety. However, the problem with 'double protection' is that it makes unclear whether varieties are still available for further breeding (Hughes & Deibel 2006; Ghijssen 2007). Of course double protection works differently in different places. For example the plant variety rights in the U.S. allow for a plant to be patented on the basis of a genetically modified trait as well as protected as an improved conventional variety. In the EU, where plant varieties are expressly not patentable, patents are still allowed as long as these are not restricted to a single variety.^{vii} In other words, when genes are patentable this either has its consequence that single protected variety can carry lots of specific gene patents or that it can carry a patent with a scope that covers lots of other protected varieties.

Furthermore, also most governments outside of the United States or the European Union need to protect variety rights since they have ratified TRIPs when acceding to the WTO. Generally speaking these are awarded to original plant varieties that fulfill the criteria of 'distinctness, uniformity and stability'. This implies that a variety cannot be protected if phenotypic differences are too much like the characteristics of other available varieties – not necessarily protected varieties – or when the traits expressed are too variable or different in respect to an average original. Such criteria are necessarily relative to the reference varieties as well as to particular locations, test periods or observers, which remains the case when DNA techniques are being used to establish thresholds for genetic difference and similarity (Art. 8 to 10 UPOV91; Ghijssen 2007). This relativity in the scope of the protection makes it subject to legal changes, for example those that were regulated in UPOV91.

UPOV91 makes it possible to try and levy charges on farmers that are replanting protected seeds for purposes other than their own subsistence. Reportedly, this is happening in the European Union but not at this moment in the United States (Ghijssen 2007). Moreover another noted example of authority over plants in farmers' fields is the highly contested case wherein Monsanto sued a farmer that replanted modified seed that had come from a neighboring field (Cluis 2007, see Kastler 2008).^{viii} While it is not the case that this last instance shows that Monsanto can sue farmers for damages when these are inadvertently growing GMO crops, it does show how the enlarged legal scope of protections can enclose crop materials that are important to farmers. The protection of a GMO crop applies to crosses with conventional varieties as well as to varieties in farmers' fields that might not even be recognizably distinct, stable and uniform (*ibid*).

The case also demonstrates a further change in the provisions of UPOV91; the treaty made the so-called 'farmers' privilege' optional. On the one hand, the 1978 revisions still affirmed that farmers can save seed from the crops grown with the protected seed that they had purchased, that they can use this seed for replanting and that they can exchange this seed with other farmers. The use of reproduced

protected seeds for further breeding and the marketing of the harvest without authorization were permitted as long as this did not involve the ‘repeated use’ of protected varieties (Art. 5).^{ix} On the other hand, there is no such permission in UPOV91 – this has been reformulated as an option that governments have when deciding on its implementation. Of course this does not forbid farmers to use varieties that are not protected since it does not make it obligatory to use protected varieties but it becomes a matter of government legislation whether or at what rate it is possible to replant seed – protected varieties, GM varieties that came flying on the wind or unprotected varieties that happen to be its consequence.

Especially when TRIPs is ratified in combination with UPOV91 a formidable set of protections is in place. Sell has advised against this combination, and since most countries are already members of the WTO it is the further ratification of UPOV91 that is most inadvisable for those ‘wishing to retain maximum flexibility and discretion to serve the needs of smallholder agriculture’ (Sell 2007: 60). The combination with TRIPs not only implies that the access provisions for conventional breeders can be limited, it also assigned a much greater authority of states over farming and the marketing of harvests. Crop material becomes covered by the principles, obligations and minimal standards that apply to over 140 members of the WTO. Specifically Article 3 and 4 of TRIPs make it illegal to favor nationals over other members’ nationals or certain members over others – the so-called ‘national’ and ‘most-favored-nation’ treatments. Its implication is that intellectual property has become a much more technical topic within international law since the early nineties – TRIPs made ‘significant inroads into the hitherto sovereign ability of countries to establish, govern and regulate IP’ (May & Sell: 2006: 175).

As explained, the TRIPs agreement does not make the extension of patentability of to genetic materials mandatory and neither does it require the ratification of UPOV91. However, the inclusion of intellectual property in a trade round was unprecedented and because it became administered by a council with the authority to investigate compliance and back it up with a trade dispute settlement mechanism. In that capacity the obligatory protection of plant varieties in TRIPs becomes interlinked to other issues of international trade that are also administered by the council of the WTO. Not only intellectual properties like patents and plant variety rights fall under its rules and regulations, for the first time agriculture was included in the Uruguay trade rounds. This is crucial because it is one of the principle themes responsible for the stagnation of the Doha trade round; agricultural policies are much more controversial than intellectual properties like patents or plant variety rights.

In other words: intellectual property reform will take place within the wider context of negotiations about access to markets. This context includes the negotiations over the new Doha trade round that were started with an instruction to the WTO to examine the CBD-TRIPs relationship (par. 19). The

examination of the CBD-TRIPs relationship entails various attempts to reform TRIPs in such a way that the incompatibilities with the CBD are removed. To remove incompatibilities between a treaty on intellectual property and a treaty on biodiversity, however, is quite another matter than making reforms that support those that live and work with crop diversity.

3.

A principle aspect of the examination of the CBD-TRIPs relationship is a stricter revision of patent-applications.

There have been many cases of patents where the active ingredient clearly pre-dates the 'invention'. Most noted are probably RiceTec Inc.'s patent on Texmati, a variant on the Indian staple basmati rice and the W. R. Grace's patent on the *neem* seed, also from India (Shiva 2002, Sheridan 2005). While many of these were challenged, withdrawn or not granted on the basis that they were not novel or inventive, a related complaint is also that patent systems function without notification or compensation of the provider of genetic materials – as the CBD requires. The CBD affirmed the sovereignty of governments over their natural resources, emphasized genetic resources as tradable commodities and referred to an obligation of 'prior informed consent' to the provider which means governments have the authority to determine access to genetic resources (CBD Art 2 & 15).

In line with the CBD, many governments have put in place regulatory frameworks for 'the exploration of biodiversity for commercially valuable genetic and bio-chemical resources' (Reid et al. 1993). Most illustrative, however, is the group of seventeen so-called 'mega diverse countries', which claim to represent between 60 and 70% of biodiversity. These include Bolivia, Colombia, Ecuador and Venezuela, that formed the Andean Pact, which includes the 'Andean common system on access to genetic resources'. Also other South American and more recently European governments have passed laws on access and benefit sharing. In 2004, Safrin reported 12 governments while in late 2006 the CBD database on 'access and benefit sharing' reported that 26 governments had such legislation in place.^x One such proposal is the so-called 'disclosure of origin' that is being considered at the WTO and the World Intellectual Property Organization (WIPO). This would make patent grants conditional on the disclosure of the source of the genetic materials used in the invention as well as requiring informed consent and evidence of benefit sharing with the relevant national regime (see Hoare & Tarasofsky 2007).

On the one hand, such a mandatory disclosure clause would make 'benefit sharing' possible; on the other hand, there are some notable limitations to such access-restriction to genetic materials on a certain territory that make its success rather doubtful. Most importantly it would require the

enforcement of government authority and control over the movement and replication of genetic material, which would be pushing sovereignty to its limits – as Sabina Safrin argues. Governments that want to halt unauthorized and uncompensated commercialization of the genetic material on their territory are operating on the assumption that such authority can be exercised similar to the regulation of other tradable resources like timber, oil and minerals. On condition of such authority, the unauthorized and uncompensated use of genetic materials could be prevented or access could be taxed – for example with the aim of redistributing some of the wealth that is being generated in modern biotechnology. However, it is only an assumption since crop genetic material has as one of its characteristics that it is very mobile – it moves on the wind from field to field, for example, and birds migrate while some of the more commercially valuable samples are microscopic life forms.^{xi}

Of course this does not rule out legislation – you cannot control the resource under your jurisdiction, but you can still prosecute. In this regard, Safrin goes further than many in arguing that as a consequence of such regimes there will be too many parties with exclusive rights over access to the genetic material commons. She recognizes such regimes as a response to the strengthening of intellectual property protections in the United States arguing that ‘the easier it is to patent genes in the United States, the harder it will be to obtain genetic samples that contribute to biotechnological innovation from genetically rich countries’ (Safrin 2004: 674). She goes as far as arguing that access for scientists from developed countries is made more difficult and ‘fights are likely over which gene originated where and which nation should rightfully capture any benefits arising from its use’ (ibid: 643-647).

In her view disclosure provisions are ‘broad and unenforceable regimes that will increase tensions between states’; they will deter innovation because researchers cannot access certain genes for their applications (ibid). In brief, there would be a tragedy of the anti-commons for genetic materials. Safrin argues that not only the proliferation of gene patents is an instance of enclosure, there are simultaneously ‘raw genes that are legally enclosed’ by developing nations (ibid). Consequently the introduction of patenting and the extension of the sovereignty principle to genetic materials are both examples of enclosures.

What she proposes to amend this tragedy is another kind of benefit sharing. Its most typical illustration is the Merck – INBio deal from 1991 wherein a substantial amount of money was paid to an NGO that managed a park in Costa Rica where Merck hoped to identify natural compounds with interesting gene candidates for pharmaceuticals.^{xii} Safrin calls the INBio example ‘a value-added approach’ (ibid: 643-7). However the decisive factor, as Brush explains, had been that the NGO had the authority to negotiate directly with Merck on behalf of the government which fully owned the land and

resources. This very direct and decentralized model with flexible norms allowed the company to pay a lump sum up front, hire the highly qualified personal of INBio and to educate locals to do the bio-prospecting (Brush 2005b: 19, 20). Brush is very clear about what sets ‘the INBio example apart from other bio-prospecting programs’ – it is the special position of INBio as a non-governmental institution with high scientific and administrative capacity that reduced the complexity of the negotiations (ibid). In other words, INBio is quite an isolated instance because much more frequently there are problems with the identification of clear cut contractual relationships.

While the ability to negotiate contracts is the key factor for successful benefit sharing of this kind, it can be expected that this is not easy in much of the areas in developing countries where the world’s remaining biodiversity is concentrated. Precisely in the most diverse environments numerous parties are likely to be involved and it is going to be politically sensitive to define and determine which communities to involve in the deal and which government agencies has the jurisdiction over the matter. Even if an agreement is reached, there might be other researchers or NGOs to contest it. Moreover, the value of a sample is rarely obvious at the moment of access and negotiation – it usually takes a long time after its initial extraction and if it is patented this is likely to happen in other jurisdictions.

It is to amend such limitations, it could be argued, that intellectual property reform is necessary at an international level. The CBD which is based on an affirmation of state sovereignty over genetic materials could be interpreted to support such a position and, as mentioned, there have been many governments that already have specific legislations in place. Notably, this also includes Costa Rica, which left behind the decentralized approach despite of the INBio example when it legislated ‘a centralized process of issuing permits’. Brush explains that the national law was formulated in line with the mandate of the CBD to incorporate access and benefit sharing into national legislation (Brush 2005b: 19). Furthermore the Costa Rican decision can also be understood by how Parry breaks down its benefits. She shows that almost all of the payment that INBio received was expended on the training and equipment necessary ‘to access, identify classify, and collect biological materials on Merck’s behalf’ (Parry 2004: 120-122, 216).

Consequently, Parry demonstrates that even the most noted success of benefit sharing at a more decentralized level it is not a effective in its contribution to biodiversity conservation. She argues that ‘it is difficult to underestimate’ how significant these new rationales about the economic incentives to conserve endangered environments were’ and how ‘by 1995 the dual rationale for undertaking bioprospecting (..) had become canonical, taking on the force of fact on the basis of little more than hypnotic reiteration’ (ibid). Not only, therefore, are there serious drawbacks and limitations to benefit sharing on a contractual basis or with individual governments, Parry adds another dimension: the role of

benefit sharing as new rationales about economic incentives. Whereas Parry reveals the INBio example as rhetoric, Safrin does the same for the idea that a disclosure of origins would make benefit sharing possible, which takes the topic beyond the practical difficulties of recognizing any realistic potential for sharing of benefits in regard of biodiversity conservation.

Hence, it can only be concluded that it is better not to make a choice when the options are an overreach of sovereignty over genetic materials or ineffectual agreements with Merck or any other pharmaceutical corporations. Concerns over biodiversity conservation as well as access restrictions on research will need to be addressed differently, which was recognized already when crop materials came under the provisions of the CBD. Crop traits are genetically very complicated and therefore there are hardly any financial benefits to be shared by restricting access. The new rationale about bio-prospecting would not apply (see Brush 2005b). Therefore it was affirmed, shortly after the ratification of the CBD, that agricultural biodiversity required special consideration in regard of the sovereignty principle that was recognized in the CBD (CBD COP decision II/15 1995, see Coupe & Lewins 2007).

4.

In 1993 the FAO initiated an intergovernmental round of negotiations to harmonize its approach with the CBD by way of a multilateral agreement. In the CBD it was affirmed that states have the right to assert their authority over crop genetic resources, which is why the negotiations initiated by the FAO organized a broad guarantee of the access to the international system for plant genetic material on the basis of its sovereignty principle. The negotiation of the “International Treaty on Plant Genetic Resources for Food and Agriculture” (henceforth “the Seed Treaty”) was concluded in 2004.^{xiii}

The Seed Treaty is remarkable as it made access to crop materials the main benefit to be shared. The treaty notably differs from the CBD in how it refers to access to crop materials as a common interest. Moreover it designates the existing system of the Consultative Group for International Agricultural Research (CGIAR) as the international framework that facilitates the access to materials that are in the public domain – either held by governments or in the collection managed by the CGIAR. When the CBD and TRIPs entered into force, the collections of crop materials that already existed at the CGIAR and the FAO had been merged to keep them outside of the jurisdictions of these treaties. The CGIAR would manage the collection under the FAO’s mandate on agriculture, who holds it ‘in trust for the benefit of the international community’, which was to prevent the collection from being claimed either by patent holders or states (see Pistorius & van Wijk 1991, Coupe & Lewins 2007).

At the time, this collection was the only remaining instance where crop materials were legislated as a common heritage – the Seed Treaty, however, arranges access to some of the most important food

crops like rice, banana and potato which are important for food safety. What is on the list of crops, Coupe & Lewins explain, is largely a political compromise rather than motivated by dietary intake or production quantities (Coupe & Lewins 2007: 28). Many crops, such as rubber, coffee, tea and peanut, have been left out for commercial reasons, while others like groundnuts, oil-palm, soybean, cassava, sugar cane, tomato, peppers and onions are not on the list despite their importance for food security. Most curiously some crops are on the list even though it is doubtful that these are essential for food security, like asparagus and strawberries.

Although this makes the list (and the political compromise) look rather arbitrary, it does cover quite a number of important crops for food security.^{xiv} Furthermore, the Seed Treaty's notion of access to the crop material that it covers comes with a compensation scheme that obligates the payment of 1.1% of net sales into the Global Crop Diversity Trust. A 'standard material transfer agreement' (SMTA) enforces its terms (art. 6). Like the list of crops, however, it should be understood that this 'obligation' is no more than a declaration to legitimize a working compensation scheme. What limits the feasibility of this compensation scheme is the requirement that the Seed Treaty is compatible to TRIPs and UPOV.

Firstly, the Seed Treaty requires compensation for using the crop genetic materials covered in the treaty when these are incorporated in products that are being sold. However this obligation is made conditional on these not being made 'available without restriction to others for further research and breeding'. This is the 'breeders' exemption' that was already discussed; there is no obligation in the Seed Treaty to compensate seeds that are protected as conventional plant variety rights. There is no restriction on further research and breeding on new and improved plant varieties that are protected by UPOV91 and hence no requirement to pay compensation.

Secondly, it is not entirely clear whether compensation needs to be paid when patenting makes crop material unavailable for further breeding or research. The Seed Treaty arranges access to plant genetic materials that cannot be restricted 'in the form received'. The phrasing is crucial because it implies that any genes, advanced lines, cells, DNA sequences and compounds could be patented without any obligation to pay compensation. The patent is not granted on the genetic material in the form received, it is granted on another form and this patent happens to cover the usage of the sample. Only if the patent does not make the conventional seed available for breeding or research might it possibly be obligated to pay compensation.

Consequently the formulations – 'available without restriction' and 'in the form received' – guarantee the availability of crop material for research and breeding but not the availability of crop

material to farmers. The Seed Treaty, like UPOV91, explicitly makes so-called ‘farmers’ rights’ a matter that governments decide on. While the terms whereby farmers’ rights were to be realized were never set in any international agreement, they refer to a collective right to save and select seed, to replant and market protected seeds and the inclusion of farmers in decision making processes (see Brush 2005a, b). Until the Seed Treaty, the FAO had referred to farmers’ rights as ‘vested in the International Community, as trustee for present and future generations of farmers’ (FAO resolution 5/89). Since the 2004 FAO Seed Treaty, however, farmers’ rights are ‘subject to national law’ (see art. 9.3 below).

Box 1 - Article 9 of the 2004 Seed Treaty

- 9.1 The Contracting Parties recognize 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 plant genetic resources which constitute the basis of food and agriculture production throughout the world.
- 9.2 The Contracting Parties agree that the responsibility for realizing Farmers’ Rights, as they relate to plant genetic resources for food and agriculture, rests with national governments. In accordance with their needs and priorities, each Contracting Party should, as appropriate, and subject to its national legislation, take measures to protect and promote Farmers’ Rights, including: (a) protection of traditional knowledge relevant to plant genetic resources for food and agriculture; (b) the right to equitably participate in sharing benefits arising from the utilization of plant genetic resources for food and agriculture; and (c) the right to participate in making decisions, at the national level, on matters related to the conservation and sustainable use of plant genetic resources for food and agriculture.
- 9.3 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, *subject to national law* and as appropriate.

(emphasis added)

The main consequence of the Seed Treaty is therefore that access to crop materials gets defined in terms that are extra-compatible to patented or double protected plant varieties. There is no incompatibility between UPOV91 and TRIPs with the Seed Treaty’s access arrangement because access needs to be limited further for the coffers of the FAO fund to fill. When such funds are made available it would become possible to begin conserving crop genetic diversity and promote its sustainable usage.

The assumption, of course, is that compensation to the FAO is the same as realizing farmers’ rights. On the one hand, FAO representatives can always insist that the Seed Treaty does advocate farmers’ rights approaches and that it tries to fund them as well as provide access to everyone: to breeders, seed companies, biotech multinationals as well as to farmers. Indeed the access arrangement could hardly be broader since neither its compensation scheme nor the so-called farmers’ rights are requirements. Its only condition is that the request is made in the jurisdiction of a country that is a member to the treaty – that is the only condition that might imply that access is not made available. On the other hand, it is questionable whether farmers’ rights are compatible to the Seed Treaty. While the

Seed Treaty is compatible to patenting, breeders' rights and state sovereignty over genetic materials, the NGO GRAIN observes – farmers' rights get realized 'if governments feel like it and if their patent or plant variety rights laws don't already preclude it'.^{xv}

In fact, the Seed Treaty hereby illustrates how enclosures and access are being interlinked in a manner that is highly particular in comparison to the previous designation as a common heritage. While farmers' rights are now strictly limited to the decision making of governments, there are at once guarantees for broad access to crop materials and provisions to encourage enclosure in the various international treaties. In other words, such broad access arrangements are the grease for the incompatibilities of the CBD, TRIPs and UPOV. Access is arranged with breeders and biotechnologists in mind with little to offer for those that live and work with crop diversity.

5.

It is at this point where the analogy with Robinson Crusoe becomes important again. The Seed Treaty is most illustrative for the analogy with Crusoe's barley (his innovation tragedy is about how he becomes a 'would-be-barley grower') because barley is one of the 35 crops that are considered so important for global food security that access needs to be guaranteed by a binding international agreement of its own.

It was explained in the introduction already that Crusoe's breeding efforts were interrupted by a footstep and by analogy there is the court ruling that upheld the oxymoron that living organisms once modified are no longer free to all men as manifestations of nature. It is the Chakrabaty patent that set in motion a legal process which Safrin calls '*hyperownership*'. She describes it as the 'corrosive interplay between the patent-based and the sovereignty-based systems of ownership' (Safrin 2004: 642 – 7, also 679). Most specifically she argues that negotiations on access to crop genetic materials at the FAO 'exemplify' hyperownership. What is exemplary is how the Seed Treaty demonstrates that the main characteristic of the 'interactive spiral of increased enclosure, or hyperownership, is a suboptimal utilization, conservation and improvement of vital genetic material' (ibid: 680). Indeed the representatives of countries began the negotiations by 'asserting state sovereignty over them' and then 'spend seven grueling years developing distinct carve outs for a more open system'. In brief, 'enclosure is the rule. Access is the exception' (ibid).

However this exceptionality is not so much about an anticommons for crop material that require access provisions and decentralized benefit sharing – as Safrin proposed. What she calls hyperownership is not only about the tragedy of too many enclosures, it also comprises how access is being arranged. The corrosive interplay at work on the Seed Treaty does show that carve-outs are

possible; or rather it shows that access and enclosure are being made into two sides of the same coin. Furthermore, it is this particular alignment of access and enclosure that resembles Robinson Crusoe's predicament with a footstep (access) that has been put earlier on; like he was interrupted trying to grow barley and brew beer, catastrophes like food insecurity are being mobilized without addressing how the innovation of those that live and work with crop diversity is being interrupted.

It is important to recall that there is a difference between crop genetic materials as a common heritage at the international level and other examples like Antarctica, outer space, the oceans, the deep sea-beds and so forth. These latter remained freely available for as long as they could not be claimed in any practical sense until there were polar expeditions, satellites, submarines and so forth. GM, however, is different because innovation with crop genetic materials was widespread everywhere as a collective process over centuries. Instead of the crop improvement that was already there – whether that of farmers who save and select seeds or conventional breeding programs – the encouragements of innovation appear as measures against insecurity that are constrained within the legal process that was set in motion in the previous decades.

It is crucial to make the distinction between measures motivated by the fear of a footstep and measures that support the innovation of those that live and work with crop diversity. Without this distinction an economic rationale becomes possible that prescribes genetic modification and the spiral of hyperownership as measures to alleviate threatened livelihoods and possessions. In other words: farmers and conventional breeders need access to crop material but what is being arranged at an international level is access of the kind that is demonstrated by the so-called 'Arctic Vault' as well as the usual take on agricultural innovation for climate change.

Firstly, the 'Arctic Vault' is the nickname of a seed depository not too far from the North Pole. While at this place crops are not cultivated – at least until the poles actually melt – since late 2007 the vault ensures the conservation and availability of millions of seed samples. The press release of the Global Diversity Trust announces that it was established as an independent international organization under international law in 2004, as a joint initiative of the FAO and the CGIAR. 26 countries have signed up, and donations came from government agencies, international organizations, multinationals and foundations.^{xvi}

What it does is to store copies of the samples from the major crop diversity collections of gene banks around the world. Because of its location it has a guaranteed temperature of -2 degrees Celsius because of the permafrost, even without electricity. With electricity the temperature is -18 degrees Celsius. The self-declared purpose of this storage facility is to function as a backup for seeds and crops

lost in natural catastrophes. Its examples include tsunamis and hurricanes and wars like that of Sierra Leone, Iraq and Afghanistan wherein gene banks and crops were destroyed. Moreover, many collections are inadequate because they are badly catalogued, mismanaged or underfunded by irresponsible or bankrupt governments that do not make crop genetic diversity their priority. Most commentary from the popular press speaks about the arctic vault in biblical terms as a 'doomsday vault' and the 'ark of Noah'. The President of the European Commission called it a 'frozen garden of Eden', Carry Fowler the director of the Global Crop Diversity Trust mentioned it as an insurance policy for the world's food supply, while GRAIN has called it a 'giant icebox' with 4,5 million seeds.

At the moment the vault mainly secures the collections of crop genetic diversity managed by the CGIAR centers and a few governments. It is not allowed to put in seeds that are already stored in the vault and only depositors can access or give permission to access the deposit. This implies that the CGIAR, whose collection is largest, decides on access to samples that might, once upon a time, have been collected from a country or a community which for some reason, catastrophic or not, needs it back. It is important, however, to realize how unlikely it is to replace crop genetic diversity that is no longer in use in the field by farmers. When local varieties disappear – either when disaster strikes or because of a switch to high performance crops – it no longer makes much of difference that a local seed variety is in storage somewhere. GRAIN goes as far as to argue that the logic of the Vault is to: 'remove crop genetic diversity from farming: as people's traditional varieties get replaced by newer ones from research labs – seeds that are supposed to provide higher yields to feed a growing population – the old ones have to be put away as "raw material" for future plant breeding' (Grain 2008).

Indeed, other than a compensation fund managed by the FAO, the access arrangements and the safe storage of crop genetic diversity in case of catastrophe offer little as an incentive for farmers to continue working with crop diversity. Moreover, the compatibility of the Seed Treaty with TRIPs and the CBD is about saving crop *genetic* diversity from catastrophe rather than farmers that live and work with crop diversity. What is to be saved is the crucial raw material for commercial breeders and biotechnologists in the face of future threats to food *security*.

Secondly the same focus on crop genetic diversity as a food security matter is particularly visible in how concerns about food security and climate change are being linked. A report from the invitation-only Bellagio Conference on '*the conservation of global crop genetic resources in the face of global climate change*' can illustrate how crop genetic diversity is being linked to food insecurity.

In the wake of the Nobel prizes and international conferences on the theme and headlines on a global food crisis of rising prices on the world market, selected representatives were brought together to

think through the common assumption that agriculture will shift in response to climate change. If its impact on the food supply is to be minimized, its summarizing statement explains, it needs to be understood that ‘crops will shift only with extensive genetic manipulation through breeding’ (Naylor, Falcon & Fowler 2007: 1). On the one hand, it identifies as its problem that much of the crop genetic diversity is not stored at all in gene banks and the quality of the data on globally traded crops is not very high; on the other hand, the ‘breeding challenge’ – as the conclusion puts it – is about the mismatch of breeders’ incentives with efforts that are focused on crop diversity.

The document observes that ‘the genetic material at the extreme ends of landrace diversity and within wild population is likely to be essential for successful breeding in the face of global climate change’ (ibid 15-17). However, the crop diversity that will be lost because of climate change will result:

‘in extreme hardship to some of the poorest of the poor as their varieties steadily lose their productivity and resilience. Absent suitable replacement varieties for such fragile economic and environmental settings, substantially increased food insecurity could result’ (ibid: 13).

While this need of suitable replacements is accurate, what drops out of such consideration is the tension with conventional plant breeding. It is a problem that there is only a limited incorporation of native crops, local cultivars, landraces and wild relatives into improved plant varieties. As the authors of the document on crop resources and climate change explain: it requires time, effort and focus to incorporate crop material that has evolved in response to many different forces in more variable circumstances into the elite breeding lines of scientific breeding programs. Usually a limited segment of the genetic collection is preferred, that performed well in the past and that contains sufficient variation for successful release of high performance varieties. Little crop genetic diversity gets incorporated into improved varieties and just as a plant variety right is relative to other protected varieties, these improved seeds are at a greater distance from the dynamic breeding resources of farmers and the locally specific improvement trajectories that are important for the maintenance of crop genetic diversity.

This is to say that breeding efforts overwhelmingly aim at those few plant species that represent sufficiently sizeable markets and cultivation under relatively controlled conditions, for instance through intensive land use, irrigation facilities and pesticide use. With UPOV 1991 and TRIPs there are more incentives for commercial breeders to improve more crops than the few that until now represented sufficiently sizeable markets and cultivation. However there is little reason why the improvement of resistances and the increase in yields for a greater variety of crop types will somehow not displace crop diversity in farmers’ fields. It is questionable whether commercial breeders will help many of those that do not grow commercial crops in adapting their livelihoods to changing conditions.

The assumption is that there is reciprocity between breeders and farmers, this is mentioned in the FAO Undertaking, but this should also not be exaggerated. While many farmers are dependent on improved varieties, breeders are not dependent on open access to crop diversity in farmers' fields. There is very little reason why breeders in the private sector would contribute to the conservation of crop diversity in farmers' fields. Paul Gepts refers to the 'paradox of plant breeding', which is to say that crop improvements for conventional agriculture have 'historically undermined the very genetic basis on which it rests' and that as a result of using improved varieties those farmers that continue to live and work with crop diversity will become increasingly scarce in many more places (Gepts 2006: 2281).

To put the paradox differently, there is not only a 'carbon footprint' – for example when attending invitation-only conferences on climate change by airplane – there is also the paradox of a *crop genetic footprint*. New and improved plant varieties intensify the kind of agriculture that is the primary threat to the survival of crop diversity in farmers' fields. *Crop genetic footprints* are left in farmers' fields that make them give up their own varieties which are to be enclosed in patents, in banks, vaults or otherwise – exactly like the footprint in the sand that Crusoe found and that set in motion how he began to build enclosures and gave up on his barley-innovations. Furthermore, this also applies to new and improved crops with humanitarian purposes, as will be explained in the next section; in that case the paradox is that new varieties are needed to address insecurities like food and climate change but that the innovations that are acknowledged are only those that are the consequence of a footstep. What is deemed necessary are new and improved crops, both GM and non-GM, that – give or take a couple of exceptions – are protected by new enclosures.

6.

There are quite a few examples of intellectual property donations that present sophisticated biotechnologies as gifts to the poor – both by multinational corporations and universities that are actively patenting their inventions. The most known example of such a donation is Golden Rice. This is a specially developed technology whereby modified crop traits are added to rice that express enhanced levels of vitamin A with the aim of curing the deficiencies of poor populations that causes blindness.

Some criticisms emphasize that the technology is far from ready, since this donation and many other similarly humanitarian biotechnologies do not work. For example Golden Rice does not yet express sufficient quantity of the relevant substance 'beta-carotene'.^{xvii} This would not be the main problem, however, if its future improvements were not subject to the commercial rights of the corporations that hold the patents. Notably the inventors of Golden Rice are public scientists who

negotiated a deal with AstraZeneca – now Syngenta – which holds the commercial rights. The deal was motivated in particular by how the Golden Rice technology was covered by too many patents for its further development, reportedly it involved some 70 process and product patents held by 32 companies and universities (Kryder et al. 2000). In exchange for ownership, the company guarantees that it allows for the distribution of the rice on a royalty-free basis to marginal farmers that live in developing countries and it allows for sublicenses to public research institutions.

However, its invention trajectory and its humanitarian usage is conditioned by several terms – it must involve public germplasm, no surcharges are permitted and export is not allowed. These same terms also apply to the additional technologies that Syngenta added and those that are controlled by other companies like Bayer and Monsanto.^{xviii} In any case, the conditioned character and the ownership clauses of the future development trajectory of Golden Rice are particularly curious, considering that the observation by the NGO ‘ECT group’ that few of the patents were at the time recognized in developing countries.^{xix} In other words, Golden Rice’s humanitarian license presents the technology as a donation and as an exception to intellectual property protection while in principle researchers in most developing countries could have continued its development (if they wanted) and farmers could have planted the modified variety (if they so wished and if allowed by bio-safety regulations).

Perhaps the humanitarian license was useful in getting support from multinationals for further development, but since the exemption it arranges was not necessary it simultaneously projects its patent and regulatory obstacles onto its potential users. In case they need it, this gift – as gifts sometimes do – comes as a curious exception to property rules and incentives that are not in place. It already anticipates these and conditions the terms for further research and development at its local project level as well as at a global level.

Furthermore the donation of sophisticated biotechnologies on humanitarian grounds also draws in the research of the CGIAR.

There is no clear policy on biotechnology in the CGIAR because of the strong reservations about molecular biotechnology among the international representatives that constitute its board. As a consequence the CG centers do not hold the relevant intellectual property and do not have the necessary patent portfolio to negotiate access to biotechnologies. What it does is to start collaborations like the so-called ‘Generation Challenge Program’. This program illustrates the way wherein the individual centers can work together with each other and with public research institutes on crop improvement that involves functional and comparative genomics.

Its aim is to increase the ‘efficiency, speed and scope’ of crop improvement of plant breeders in the

developing world on behalf of farmers in marginal environments.^{xx} It takes the already extensive sets of sequences on the major crop varieties in the CGIAR mandate – like varieties of rice, sorghum, maize, barley, millet, wheat and others – and tries to extend their genome maps. Consequently, it integrates a range of genetic diversity into existing standardized datasets that can be analyzed with micro-arrays and molecular markers from multiple laboratories anywhere at anytime. Hereby these crops can become a part of already on-going comparisons of various crop genomes and it would supposedly become possible to identify gene candidates that are expressed under those specific conditions that are particularly important to subsistence farmers – like those resulting from climate change. Ultimately the aim of the toolkit is to allow for more specific selection of genotypes for the breeding lines of molecular programs.^{xxi} As already mentioned, crop traits are genetically complex, and particularly so when investigating the more diverse varieties. Consequently it is highly ambitious to presume that predictive genes or gene functions could - as well as more complex interactions like protein expression and regulatory pathways – be identified. Similarly, the assumption is that these could be used in specific crop improvements against drought and stress tolerance.

Like Golden Rice, also the CGIAR's Generation Challenge involves a 'humanitarian use license'. This is a legal provision whereby any future technologies are designated as available to 'subsistence users' around the world and to researchers on subsistence crops who cannot afford to license biotechnologies. Its description says that such a technology can be used, made, and sold without royalties for trade or business that results in monetary income of less than €10,000 per year per business. While this sounds nice, this is a curious policy provision from the viewpoint that the Generation Challenge is a shared project of the CGIAR centers that have a policy to make its germplasm, technologies and research results available in the public domain. As such, the composite sets of information on drought and stress tolerance of the different crop species and their wild relatives would have had to be released in the public domain – freely available in line with the general policy of the CGIAR.

Consequently it is not so strange to ask what difference a humanitarian licenses would make to the research of the CGIAR. The answer, of course, is that they are a necessary ingredient whereby to be able to collaborate and enter into public-private partnerships with the main research institutes and universities whose policies by now, as mentioned, usually prescribe that they have to apply for patents. Lastly, a humanitarian license also appears in terms of how public research, particularly in the US and perhaps in the future also in Europe, is trying to arrange for a '*freedom to operate*'.

The Public Intellectual Property for Agriculture (PIRPA) has declared that it aims to make its

patents available for research on subsistence crops. Notably this is a consortium of important public research institutes and universities in the US that have decided to pool the 24% of patents in agrobiotechnology. It uses its patents defensively in the sense that since with each generation the exchange of germplasm gets more restricted – through the proliferation of intellectual properties held by seed companies, biotechnology corporations as well as by universities. The patent pool is to be used to cross license with the private sector in order to have guaranteed access to germplasm and basic technologies (Atkinson et al. 2003).

While PIPRA admits to having very little demand so far from developing countries (perhaps for the same reason as with the Golden Rice patent problems), their attempt at a patent waiver would be relevant for the CGIAR centers that aim to make their varieties available globally. It would be useful for them to negotiate a freedom to operate, since they do not have a patent portfolio whereby to collaborate with corporations that hold most technology. Of course such a molecular biology exemption on humanitarian ground assumes that the further usage of sophisticated biotechnologies is necessary. Furthermore this gives the look of a humanitarian addition to the reform of the breeders' exemption in UPOV91. On the one hand commercial breeders only make available finished varieties for further breeding and do not have any obligation to make available their own research, intermediate material crosses, backcross population, progenies and selection (see Hughes et al. 2006). On the other hand, collaborations with the CGIAR – whether companies or universities that hold patents – deliver seeds with genetically modified traits that are available for further research on subsistence crops only. They are only available with that aim; otherwise the varieties are patented as usual.

Such “humanitarian licensing” has as its flipside the need for secrecy. A ‘secrecy clause’ is necessary for the companies and universities with a policy oriented at patent applications to enter the collaboration. Whereas the CG centers release their research results and standardized datasets into the public domain, patenting requires confidentiality as to not make patent-strategies public or undermine the novelty criterion for patenting. Consequently a secrecy clause is needed for collaborative research that might otherwise make confidential data available in the public domain before patents got granted. This would, however, require a revision of CG policies, which in 2008 was under discussion with the private sector.^{xxiii} More importantly, such a further collaborative turn towards research on crop *genetic* diversity would be further illustration of the on-going renegotiation of the terms of patents – both privately and publicly held.

In this way it might be that the germplasm and the genome maps are made public but crop traits that are being grafted into the seeds would remain proprietary. In other words: the discussion over the collaborations – of golden rice, the generation challenge or the CG collections – centers on the

possibility to give traits and seeds away as a *humanitarian exception* to enclosure that are already in place as the general rule. What is important is that this is not so much a practical concession in regard of how pro-poor innovation is otherwise not possible; what is conveniently ignored (as instructed in international treaties) as a part of its problem is how *crop genetic footprints* are being put down when more seeds and crops are released in line with the uniformity of mono-crop agriculture.

Like Crusoe gave up his innovation out of fear of savages that might come to his island, similarly catastrophe is mobilized to arrange exceptions to patents as a general rule. In fact the state of affairs in the year 2080 is mobilized to arrange highly specific exceptions to patenting.

Climate Change in the far future and Biotechnology for the Poor

Premise 1: let's all agree that in 2030 or 2070 weather conditions have radically changed

Premise 2: crop genetic diversity is essential to adapt to radically altered 'agro-climatic conditions'.

Premise 3: it is necessary to improve the varieties of farmers if we are going to be able to feed the 'poorest of the poor'.

Premise 4: this implies that those traits are needed that exist at 'the extreme ends of landrace diversity and within wild populations'

Premise 5: intensified breeding efforts require newer biological techniques and the improvement of gene bank collections.

Conclusion: request for more funding and compensation for the agricultural mandate in the name of climate change or whatever what not kind of catastrophe is going to require adaptation of crop productivity. But do not forget the disclaimer: always mention a few times that on-farm conservation and the realization of farmer's rights is also really important.

In other words, it is a consequence of a footprint (the Chakrabaty patent) that certain innovations but not those of farmers are proposed as necessary to save 'island-earth'. The problem is not that these innovations could not have a humanitarian purpose, the problem is different. Such seeds are pro-poor in typical fashion – they are an improvement relative to genetically engineered mono-cropping and the worst kinds of chemical fertilizers. Indeed why not take it to a next stage: making available carbon credits for having the poor use slightly less polluting but otherwise patented, overpriced and industrial seeds and their inputs? In such a scenario everyone outdoes each other in being very preoccupied with the various insecurities that face humanity without being concerned about the 'crop genetic footprints' that are kept outside of the legal process that has been set in motion.

More seriously, there are exemptions being made for breeders and biotechnologists but it is treated as the slightest of details that a few companies are very much in the process of claiming broad patents that cover the crop traits that are closely related to climate change – like drought tolerance, water resistance, cold and salinity.^{xxiii} What this amounts to is a paradox that is also a tragedy; exceptions to patents are possible to allow scientists to address the various insecurities by way of new crops for the

poor but what is not confronted are efforts to restrict the availability of exactly those crop traits that might be in demand by farmers when climate change or other insecurities become even more acute.

Two: intellectual property reforms

1.

To most, the balancing act of enclosures and access is rather a technical or policy specific matter; unlike, for example, much more controversial debates on the freedom of speech. The endless discussions on the limits to freedom of speech are considered essential for free societies while it is for some reason not equally obvious to also consider the debate over intellectual property rights in those terms; that is to say as integral to the wellbeing of modern societies. Indeed few would deny that also innovation is intricately related to the many catastrophes that threaten humanity as a whole – whether as its cause or as its solution. And, if innovation is that important for food, health, wealth and so forth, then this includes intellectual property protection.

On the other hand, it is notable that those that would claim their freedoms of speech without restrictions and those that would claim protection are often referring to each other. At least polemically speaking they are two sides of the same coin. In many societies, particularly in Europe, it is everyday stuff that those that would maximize their right to insult others and those that would claim maximum protections encounter each other on a wide range of topics. They encounter each other on topics that are usually closely related to the most classical insecurity themes such as war, terrorism and religious fundamentalism. By analogy a similar sort of confrontation could be imagined over the demands for even more intellectual property protections or over scientists that claim their freedoms. Also in this case the terms of the debate are kept narrow – liberties and protections again presuppose each other. More specifically, the matter defined in line with how the private sector has claimed their protections in the recent past and with their contenders: those scientists who claim their freedoms to operate on humanitarian grounds – innovating and inventing for the global good.

Obviously, however, discussions over more or less protections are not only the prerogative of public or private sector scientists. Similar to the discussions over more or less freedoms of speech wherein themes that are not about maximum protection or liberty are crowded out, what disappears when considering intellectual property protection is the eventuality that others – for example the usual suspects of food insecurity – could be as innovative or even more innovative.

This is nothing too new, of course; it has, in fact, constantly been pointed out since the time of the negotiations over TRIPs and the CBD. An example that shows this is the 1993 Bellagio declaration whose

authors already knew that those:

‘who do not fit this model -- custodians of tribal culture and medical knowledge, collectives practicing traditional artistic and musical forms, or peasant cultivators of valuable seed varieties, for example -- are denied intellectual property protection’.

The declaration is not particularly important but what is interesting is that this argument in the early nineties emphasized the importance of the public domain in regard of how intellectual property is selectively blind. Because intellectual property cannot recognize the scientific and artistic contributions of many of the world's cultures, it is explained in that declaration that the importance of ‘the public domain’ is overvalued. Consequently its emphasis is not only on scientific freedoms but on how intellectual property fences off the commons that is necessary for future creation. It points out that the basic assumption of intellectual property is undermining this by operating on an ‘inventor paradigm’, which is kept implicit. The declaration observes that ‘the international community seems unaware of the fact’.^{xxiv}

A similar viewpoint also reappears in James Boyle’s description of a ‘second enclosure movement’. He is well known for his opposition to the myth of the ‘romantic author/inventor’ that would reward heroic individuals with intellectual properties for their inventions (Boyle 1996, 2003a). His critique of the strengthening of intellectual property has been among the most influential in revealing the importance of the public domain – as the unrecognized domain from which the raw material of invention come into existence. However also with Boyle the problem remains the same: the selective blindness of the inventor paradigm – also when innovation becomes more collaborative and less tied to intellectual property protections there are still those that do not fit within the innovation paradigm to begin with.

In this regard Boyle’s defense of the public domain has attracted the criticism that it is blinded by its own inventiveness. Madhavi Sunder has argued that the defense of the public domain is trapped in a ‘*romance of the commons*’. Also this is a tragedy but different than that of a second enclosure movement – it is about the mistaken and persuasive belief that if a resource is open to all it will be equally exploited by all (Sunder 2007: 106, Chander & Sunder 2004, see also Boyle 2003a). Sunder warns that a ‘binary view of intellectual property versus the public domain may not be to the benefit of the world’s poor’ as it also presents ‘poor peoples’ knowledge as the raw material of innovation – ancient, static, and *natural* – rather than as intellectual property that is about modern, dynamic, *scientific*, and *cultural invention* (Sunder 2007: 100-106).

Moreover Sunder does not only argue that the public domain is undervalued – she also stresses that

the poor should and can pursue their own enclosures. In fact she sees this as an on-going development because: ‘the traditional advocates for preserving the public domain have flipped’ since:

with the imbalance of TRIPs being more and more apparent, advocates of the poor are turning their attention to securing affirmative intellectual property rights for their own cultural and scientific innovations’ (Sunder 2007: 106)

Not only is it in question whose knowledge is protected by intellectual property and whose knowledge is not – Sunder proposes that those that are not deemed eligible should seek ‘to own copyrights, trademark and patents in their own cultural and scientific inventions’ (ibid).

Indeed why should the contemporary commoner not be demanding or making his or her own enclosures? There is no reason why the poor – as Sunder suggests – should not claim their special protection where they can and she is right to argue that this is not impossible, as will be discussed in the observations that follow. The point, however, remains the same also when demanding intellectual property reforms in name of the poor. There is a crucial distinction to be made: not all reforms that affirm the innovation of the poor help much in gaining recognition that much more comprehensive reforms are needed. This is the same point that was already made for how access was arranged in UPOV91, the Seed Treaty as well as the examples of seed banks and freedoms to operate. These all illustrate what Sunder calls the ‘romance of the commons’. The same applies to intellectual property reforms; it is necessary to recognize that only certain accommodations can be made while others cannot. Most specifically those reforms that are not compatible to a further liberalization of agriculture are not on the agenda of the Doha round. The examples of intellectual property reform also demonstrate the removal of the developmental issues from the on-going trade negotiations.

This will be argued next: the liberties and protections that are being equilibrated with such tremendous efforts and precision only get to live up to the many declarations on the importance of encouraging the innovation of the poor *on the condition* that these are kept within the bounds of a comprehensive push for more of the same mono-cropping.

2.

There are also various attempts at intellectual property reforms to consider alongside the access arrangements that were discussed previously. Also these reforms are specifically defined as exemptions of patenting as a general rule.

A principle source of intellectual property reform is a brief sub-article of the CBD. In article 8J it is stated that benefit sharing should be made possible in regard of the contribution of the:

‘knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for consideration and sustainable use of biological diversity’.

A typical way to define the concept of “traditional knowledge” is to emphasize that traditional lifestyles of a community or people, codified or not, passed between generations, embody intellectual activity and insight.^{xxv} Moreover the protection of traditional knowledge would apply to cultural expressions as variable as songs, dances, stories and artworks as well as symbols, marks and other recurring expressions of traditional concepts. Specifically for farming such protections would include crop diversity, like soil types, irrigation techniques, pest control methods, planting patterns, tenure arrangements (see also Brush 2005a: 102).

Their protection is not impossible. Exceptions to patenting are possible – for example by making access arrangements – and similarly it can be no objection that it is impractical to make a potentially tremendous range of new subjects eligible for intellectual property protection. Why would this be any different than with existing patent law? It is not possible to define very precisely what traditional knowledge is, but neither is this necessary; also patent law does not define what exactly constitutes an invention. Patent law is operational even though it has remained debatable whether a business method or a gene expression is an invention or a discovery. These can still be patented on the basis of the criteria whereby they are recognized as inventions (e.g. novelty/ non-obviousness/ usefulness). Similarly it would be possible to consider the protection of particular expressions of traditional knowledge – along the lines of the CBD article on the subject. This would require a similar sort of arbitration as with patents, on the ‘methods of making’ traditional knowledge.

Important in this regard is that what is traditional does not refer to age or to the longevity of the management of crop genetic materials in farmer communities as static entries, like in some gene bank. Rather it refers to dynamic and changing informal rules and customs. As such Pires de Cavalho points out that it would be nothing short of miraculous if cultural expressions would stay the same throughout millennia rather than referring to the dynamic character that involves particular rules, protocols and customs of communities everywhere (Pires de Cavalho 2000: 6, 7).^{xxvi} This endless variation also appears when looking for traditional knowledge in farming. Stephan Brush has elaborated at length for crop diversity that that neither its management as a common heritage nor as a common property ‘imply a lack of rules’ – it only appeared this way because the dynamic management of crop evolutionary processes had been invisible until efforts were made to restrict and privatize the exchange and use of germplasm (Brush 2003: 8, 2005). Although there are no particular set of farmers that have control over crop evolution, many individual farmers or specific communities regularly make specific contributions.

It can therefore not be a substantial objection that it is unfeasible to reward a collective process. There is no *a-priori* ground why it would be impossible to expand intellectual property to cover the traditional knowledge that was already referred to in the Seed Treaty.

While this is not impossible, the problem is one of another magnitude – it is crucial to recognize how a combination of access arrangements in name of usual suspects of food insecurity are combined with certain intellectual property reforms rather than others. The proposed reforms are not principally about the innovations of those that are most threatened by the ‘crop genetic footprint’ that others are putting down. On the contrary, these reforms are kept in close alignment with a specific political context: the negotiations over access to markets, including a further liberalization of agriculture in the trade negotiations.

The most suitable example is the so-called ‘geographical indicator’, which refers to goods that are protected with an intellectual property that is granted on the basis of their geographical origin. On the one hand, the example is important because it shows that it is not impossible to interpret this clause of the TRIPs agreement in such a way that it would back up the protection of traditional knowledge and support those that live and work with crop diversity. On the other hand, it would be a misunderstanding to also think that such aims are what the on-going reform efforts are about.

Already regions, rather than individuals or communities, are the subject of protection in many places and even already a part of TRIPs. Most notably, Article 22.1 of TRIPs is about ‘geographical indications’, which

‘identify a good as originating in the territory of a Member, or a region or locality in that territory where a given quality, reputation or other characteristic of the good is essentially attributable to its geographical origin’.

Member states are required to prevent references to geographical origins that are intended to mislead consumers or as an unfair advantage in the market (Art. 22.2) and there is a higher level of protection for wines and spirits (Art. 23.4). In particular for the EU, geographical indicators are important for the protection of goods or services whose quality and reputation is linked to the geographical origins – in particular for wines and spirits but also for other products. The EU has already renegotiated bilateral treaties with non-member countries to mutually protect a number of geographical indicators (Grant 2007: 181).

A critique by the US delegation and related lobbyists is that unlike trade marks that are protected in the market and are marketable, a geographical indication already has market recognition and value among producers worldwide but serves to limit its usage to a small subsection of exiting producers (*ibid*). Along similar lines the geographical indication can be seen as disguised protectionism by the EU

– the extension of geographical indicators would then not only protect Champaign or Scottish Whiskey (as well as Tequila and Bourbon) but also Roquefort and Parma ham. At least some of the EU’s motivation for seeking the establishment of a multilateral registration and notification system rests on the assumption that this would aid less competitive farmers to make the shift from quantity to quality agriculture, helping EU farmers to move into the production of value added products of niche markets.

Consequently, the very same reforms that play a role within Europe’s own agricultural reform are also some of the concessions that the EU made to developing countries in the stagnated Doha Trade Round. The geographical indicator is then presented to developing countries as one of the mechanisms to ‘empower local communities which can continue to commercialize without displacement by global mass production’ (Sunder 2007). As such it is prohibited to sub-license a geographical indication to elsewhere – it only applies to goods that are exclusively local or regional and this requires a broad proof of origins and historical records. Therefore it might recognize the quality and reputation of particular local communities – which would become authorized producers. Of course many others would be denied the use of the name – for example Gouda cheese is not necessarily made near the city of the same name, it is also made in Wisconsin as well as in Ethiopia. It could therefore be argued that protections for local areas would be obstacles to access and innovation and that such protections encourage inappropriate authenticity claims – for example leading into a dispute over Gouda, like Parma, in fact being a local product or one that necessarily still involves the original craftsmanship.

The point is, however, that geographical indicators show that intellectual property reform could be possible within the reform of TRIPs and it could even be interpreted in line with the protection of traditional knowledge such as the protection of crop varieties as cultural expressions. It shows that the protection of the traditional knowledge of individuals, communities and regions could be possible; that is not the problem. The problem is the underlying assumption that it is by way of such measures as well as access arrangements and freedoms to operate that the claims of those excluded from protection for their farming-innovations are to be acknowledged. This is what is questionable; the innovations of the poor are being affirmed separately from more controversial demands for legal reforms – like rights-based approaches to the dispossession of land or the aspirations for self-rule of groups with different ethnic identities.

In other words: the debate on intellectual property reform also demonstrates how easily affirmations of local innovations of farming communities could come in place of the much more comprehensive reforms that are required for communities to be able to adapt to outside threats such as the uniformity of crops used in industrial agriculture or the effect of climate change. This will be discussed in the next section.

3.

It is particularly notable that the examination of the CBD-TRIPs relation – which was instructed at the beginning of the Doha Trade Round – was conveniently delegated to the WIPO.

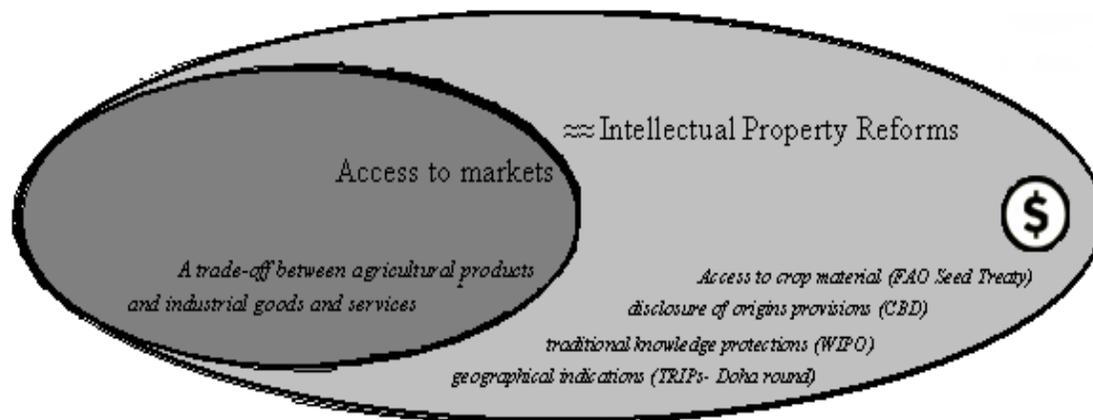
The WIPO mandate, Sell explains, is ‘particularly intriguing given the audacious shifting of intellectual property out of the WIPO and into the GATT in 1986 at the outset of the Uruguay Round’ (Sell 2007: 67). At the time the WIPO, like the FAO, was sidelined because it was too focused on development issues; it now reappears as a discussion forum on the development agenda for intellectual property. Many of the proposed intellectual property reforms that involve traditional knowledge are debated primarily at the WIPO, which is a consequence of developing countries that threatened to block negotiations on its ‘substantive patent law treaty’. They insisted on a development agenda for intellectual property reform, which includes traditional knowledge, custodianship and cultural responsibility in conservation efforts although very little agreement exists on what such an agenda would be about.

Therefore intellectual property is designated as a possible concession on traditional knowledge but simultaneously it is a theme that has been separated from the main negotiations of the trade round. The examination of the compatibility of TRIPs and the CBD was removed from the main negotiations on agricultural liberalization, which has become the principle demands from developing countries. In 2005 at the Hong Kong meeting of the Doha Round the so-called Group of 20 allied itself with other developing countries forming the Group of 110, to push for greater liberalization on agricultural trade and the reduction of subsidies. This was too unstable an alliance to represent the developing world as a whole but still resulted in an uncomfortable isolation of the EU, the US and Japan.^{xxvii} While the EU and the US demand that developing countries open their markets to services and industrial goods, they only have minor reductions in agricultural subsidies to offer to developing countries.

Although trade rounds usually take longer than their deadlines, the Doha Round should have been finished in 2004 and by 2008 there was still little indication that a conclusion might be possible in a few years. Therefore themes that might otherwise stagnate the negotiations of the Doha Round have been diverted to elsewhere; this is the case for themes like food security, small farmers and genetic resources, as well as a reform of intellectual property centered on traditional knowledge. These are still being discussed but outside of the scope of the Doha Round – as sideshows of possible packages of special and differential treatment for developing countries that get staged without complicating the trade negotiations. On the one hand this removal also implies that it is to some degree possible to negotiate

over objections to intellectual property protection and to call for international regulation on behalf of farmers and indigenous peoples. For example it makes it possible to demand for stricter revisions of the patent system, proof of origins, and geographical indicators (Dutfield 2005, Safrin 2004: 642, Sunder 2007). On the other hand such proposals for the reform of intellectual property take place within a wider context of a liberalization of agriculture and this also sets much of the terms under which its expansion is debated.

This is the reason for the dollar sign in the image below.



The elements listed in the light grey area that says “intellectual property reforms” have been discussed. The dark grey area says “access to markets”. It shows that the balancing of intellectual properties and access is relative to the negotiations of the Doha Round, that there is an interrelationship between such reforms and the emphasis on access to markets in the trade negotiations. In fact the list of intellectual property could also be described as a “liberalization of protection mechanisms”. This is a compromise that is supposed to make further liberalization of agriculture possible – in exchange for market access.

The image shows that intellectual property reform is possible as a trade-off. The reforms are secondary to the trade deal, which does not stagnate because it aims to help the poor in claiming their own inventions but its aim is to facilitate further access to markets. It is highly doubtful whether a more comprehensive intellectual property reform will still be politically convenient for developing countries also when these would be successful in their push for the liberalization of agricultural markets. If their demand would be met, then this would ultimately have as its consequence even more uniformity in agricultural crops. To compensate it might be that even more reforms and access arrangements are negotiated; that is not the problem – the problem is the underlying assumption that those excluded from protection for their farming-innovations can be accommodates by way of protections of local products and traditional knowledge.

This is questionable; intellectual property reforms represent only one normative vocabulary that

selectively accommodates a few claims among others. It might reform who gets to be an inventor and which inventions are eligible for protection but the image above does not show a framework wherein intellectual property reforms could encourage a more lively production of new and improved varieties and to protect a wide range of related cultural expressions. This requires more substantial references to farmers and indigenous peoples and these are not on the agenda of the Doha round. What is on the agenda is a further liberalization of agriculture accompanied by a liberalization of reform proposals.

The distinction made in the oval image between access to markets and intellectual property reform also corresponds to Crusoe's dual preoccupation with access and enclosure. It is the particular alignment of both sides that is the tragedy – both types of reforms are kept in line with a legal process that was set in motion by the Chakrabaty patent. Furthermore this predicament with a footstep was already captured by Jack Kloppenburg when he wrote about the separation of 'the agricultural sector from the capitalist mainland' in the conclusion of *'first the seed'* (1989). Instead of a footstep in the sand found by Crusoe on an isolated island he observed that biotechnology makes it possible to construct a bridgehead from the capitalist mainland whereby to control the seed. As Kloppenburg argued in the late eighties, the techniques that are generally grouped as biotechnology are at the core of how 'capitalism's engineers have tried to bridge those straits', making it possible 'to build bridges to the island empire' (Kloppenburg 1989: 280-290).

Most literally biotechnology is about constructing bridgeheads to the 'island-empire', which with Kloppenburg was about the biological obstacles to a further commodification of the seed. However such an 'island-empire' is a lot like the footstep that has been set on the beaches of Crusoe's 'island-empire' that makes it necessary for Crusoe to build fortifications and to find caves to hide himself. What is tragic about the figure of Crusoe as a '*would-be*-barley inventor' is that he wanted to work on his crop improvements and fermentations but has become preoccupied with a footstep in the sand. His insecurity makes him protect his livelihood and his possessions and give up his innovations because after the initial stage of worry he begins to build more and more enclosures. This process is now well on its way – the sophisticated biological techniques that are being introduced motivates plant breeders and biotechnologists as well as governments to enclose their possessions. On the one hand, this is about new abilities to access genetic materials and the markets that this access represents; on the other hand, this implies that they have to be protected by patents, in banks, vaults or otherwise.

This is the next stage – where there are bridges to the island-empire and when what was enclosed needs to be made available again.

While some sort of intellectual property reform might be useful in allowing local communities to be able adapt to the insecurities that affect them, it should be clear that the support for scientists to patent their innovation is much greater than the support for farmer communities and indigenous peoples. It was already explained how farmers' rights were made into national responsibilities – in UPOV91 as well as in the Seed Treaty. Furthermore it can also be observed that the international recognition of indigenous peoples is much more substantive than that of farmers ever was even though it remains contested and constrained within the limitations of the mandates of international organizations.

Since the early nineties there has been quite some progress in the negotiations over indigenous rights. Indigenous peoples have an international status that has limits and is contested but is nonetheless a rare and solitary instance in international law of recognition for individuals, communities and peoples that do not have clear national or international legal personalities (see Kingsbury 1998, Meijknecht 2001). In 1991, Convention No. 169 by the International Labour Organization (ILO) referred to 'peoples' rather than populations for the first time in an international agreement while also making the provision that the question of self-determination is not within its competency. It explicitly writes that indigenous peoples are 'only users of the object of protection and [...] cannot constitute an entity which threatens the unity of the state'.^{xxviii}

Until then the term 'indigenous' had been used in ILO Convention No. 107 in the fifties that refers to the quick disappearance of indigenous groups. At that time governments were made responsible for their effective integration into national communities. For three decades this had been the only agreement that involved any kind of special rights for minorities by its reference to the protection of 'indigenous populations', which avoided any connection to the right of self-determination.^{xxix} Consequently, the ILO agreement from the early nineties is remarkable as: 'one of the rare examples of a convention in which special attention is paid to peoples, as groups, living within independent states' (see Meijknecht 2001: 149–169). What makes the agreement different is that it does not refer to the rights of the citizens or peoples that are generally recognized as occupants of nation-states. The recognition for indigenous rights can make it more difficult for governments to define on their own terms who get to be the subject of the non-discriminatory articles of such agreements. In many places a designation as an indigenous peoples is, for example, closely related to contestations over the property titles over traditional lands and resources.^{xxx} Furthermore, it is intricately related to references in international law to the right to preserve cultural heritage and languages. This includes the non-substantive references to traditional knowledge – like article 8J, the Seed Treaty and in regard of some of the proposed intellectual property reforms.

What the ratification of articles and treaties on indigenous peoples makes possible is that

international organizations can incorporate and elaborate these in their mandates. Since the nineties, for examples, indigenous peoples became part of the development strategies of the major development banks that began to single out some of the most isolated areas and marginalized indigenous peoples in the developing world for their anti-poverty programs. In late 2007 a non-binding agreement became operational called the ‘Declaration on the Rights of Indigenous Peoples’, which notably refers to peoples and their self-determination. It has been signed by most countries other than the developed countries with indigenous peoples within their jurisdictions like the US, Australia and New Zealand. While some countries might not sign it, the new treaty makes it increasingly likely that some of its articles will become adopted and incorporated throughout the UN system as well as the development banks.

However the long process of the negotiation of this new treaty – from the early eighties onwards – shows that the claims and demands of groups, communities and peoples that aspire self-rule are set against the background of concepts like peoples, nations, sovereignty, the right of self-determination and citizenship. The references to indigenous peoples in international mandates are also indicators of the constraints on recognition. Whatever gets to count as traditional knowledge and innovation is subject to the limitations that are shown in the long and contested process leading up to the wording ‘indigenous peoples’ rather than ‘indigenous populations’. The international legal personality that indigenous peoples have – and that farmers do not – does make it more likely that certain measures will be taken in their name but also this recognition is no basis for a more concentrated effort to support those that live and work with crop genetic materials.

In brief: the acknowledgement in international mandates is limited by the need for compatibility with treaties that operate on faulty premises and that are for all practical purposes mutually exclusive to their own self-defined aims. What is eligible for protection is kept in close alignment with the bounds set by the sovereignty-based negotiations over reforms and of international mandates wherein only certain sorts of knowledge, traditions and types of social organization are acknowledged when protecting innovations. This is cause for concern because there is only a precarious balance to be struck between the possibility of encouraging local innovations of farmer communities and indigenous peoples and the more comprehensive insecurities that are the reason why they are regularly mentioned in an entire range of legal provisions. The point is not that there is no urgency to reform intellectual property but that these reforms will at most accommodate a limited number of aspects from a multiplicity of cultural differences and identities. The demands of farmers and indigenous peoples for more recognition at the international level – which might or might not include crop genetic materials – involves singularly complex historically negotiated identities and cultures that are contested, imagined and re-

imagined by themselves and by interactions with others.

Some farmers conserve biodiversity while others do not, some own their lands other do not, some would approve of GM substance crops others would not and some are engaged in breeding while others are not. Sometimes entire communities are dependent on a global collective management system for genetic material, while at other times individuals or entire peoples contribute. Similarly not all indigenous peoples are suppressed ethnic groups that contribute to biodiversity – some are not necessarily ethnicities, others have not been colonized, some have no particular historical relation to their land and it might be hundreds of years that have passed wherein a community lives alongside the settlers that once colonized the area.^{xxxix} In fact many farmers and indigenous peoples are inventive while some are much less so. To put it differently: the reforms that can be proposed within the context of the trade negotiations isolate very specific characteristics that are only at the most superficial level indicative of the demands of farmer communities and of indigenous peoples. The ways wherein cultures that are internally diverse, transform, overlap with other groups and cultures can be accommodated are being aligned with an inventor paradigm and they are not being aligned with more comprehensive reforms that are required to be able to adapt to the insecurities.

It is therefore only too understandable that indigenous peoples as well as farmers remain suspicious of proposals to make available the crop diversity that they live and work with. The constraints of such a framework are reminiscent of historical experiences with many forms of appropriation, including how access ends up making possible the ‘exploitation of some more than others’ and there is no reason to consider on-going reforms to be different. Of course there are many insecurities that are real enough and it might be useful in that regard to acknowledge many more innovations in the on-going reorganization of crop genetic materials, like geographical indicators, traditional knowledge protections as well as more open access arrangements and collaborative innovation trajectories. However it is even then still a tragedy that more substantial recognition of those that live and work with crop diversity is impossible in international treaties when there is the slightest hint of any incompatibility with the existing commitment of states to mono-crop varieties and access to markets.

5.

What was enclosed in the previous decades is being made available again as a necessity for future inventions that are to save humanity. Also this is a tragedy. It is not tragic because innovation in general is frustrated; what is tragic is the highly particular alignment of access and enclosures that makes up the specific analogy with Robinson Crusoe and his crop improvements. Enclosure is being made into the

general rule by legislating only humanitarian exemptions like seed banks that make available crop *genetic* diversity as a resource that is a matter of the freedom to operate of crop scientists. As the report on climate change illustrated, such exceptions are possible by mobilizing population pressures, food scarcities and population increases caused by temperature rise, changing weather patterns and so forth. These insecurities seamlessly bring together the demand for broad access provisions like the Seed Treaty with the freedom to operate for crop scientists in name of humanity –unconstrained by how patents became the general rule.

In brief, access, insecurity, and enclosure. These are the three points of the triangle that in Crusoe’s case began with a mere footstep and these demonstrate what is “anti” about an anti-commons for crop material. The problem is not only about too many protections that interrupt access; the problem is about how too many intellectual property protections and humanitarian exceptions are being defined in such a way that it supports a further intensification of the focus on modified and uniform crop traits. What Safrin describes as ‘hyperownership’ only refers to enclosures like patents and sovereign authority over genetic materials; what this ignores, however, is how the terms of the discussion about access and enclosure are where there is a difference – the current negotiations are being held on very different terms and against a very different background than in the eighties and nineties.

It is in this regard also that James Boyle’s sympathetic proposal to rename the World Intellectual Property Organization (WIPO) as the ‘World International Wealth Organization’ is relevant as well as the useful listing of the ‘Geneva Declaration on the future of the WIPO’ (see below).^{xxxii}

Geneva Declaration on the Future of the World Intellectual Property Organization

Humanity faces a global crisis in the governance of knowledge, technology and culture. The crisis is manifest in many ways.

- Without access to essential medicines, millions suffer and die; (..)
- Anticompetitive practices in the knowledge economy impose enormous costs on consumers and retard innovation;
- Authors, artists and inventors face mounting barriers to follow-on innovation;
- Concentrated ownership and control of knowledge, technology, biological resources and culture which harm development, diversity and democratic institutions; (..)

At the same time, there are astoundingly promising innovations in information, medical and other essential technologies, as well as in social movements and business models. We are witnessing highly successful campaigns for access to drugs for AIDS, scientific journals, genomic information and other databases, and hundreds of innovative collaborative efforts to create public goods, including the Internet, the World Wide Web, Wikipedia, the Creative Commons, GNU Linux and other free and open software projects, as well as distance education tools and medical research tools.

See <http://www.cptech.org/ip/wipo/genevadeclaration.html> (last checked August 2008)

The declaration mentions the concentrated ownership of biological development alongside such themes as access to medicine and barriers to the next generations of innovation. Furthermore it highlights when and where intellectual property provisions do not offer protection alongside references to access arrangements and the collaborative character of innovation. It even emphasizes open source in informatics and ‘hundreds of innovative collaborative efforts’ – as do other declarations of a similar view like the Adelphi Charter and the proposed A2K treaty from 2006 that seeks to ‘protect, preserve and enhance the public domain, which is essential for creativity and sustained innovation’.^{xxxiii}

However the tragedy is that such a public domain approach remains tied to an ‘inventor paradigm’ that limits the access arrangements and humanitarian exemptions that are made possible. The contribution that such exceptions to enclosure might make is relative to the efforts to keep the ‘inventor paradigm’ defined in line with the existing rules for intellectual property protections. Such lists of access arrangements and collaborative innovations show the dual predicament with access and enclosure, neither of which ends up supporting the work and inventions of those that live and work with crop diversity. It is in this sense that the story from the eighteenth century adds to Kloppenburg’s ‘island empire’ of the late nineteenth century. The point is not that Kloppenburg’s ‘island-empire’ has been bridged in its entirety – only footsteps have been set. These were, however, enough of a threat to Crusoe to make him give up on his inventions, which, as will be discussed next, also came to characterize the very last period on his island when, long after he gave up his innovations when *Friday* makes his appearance. There is no reason why Crusoe might not have shared his island-empire with Friday on equal terms. What happened, however, is that Friday appears in Crusoe’s tragedy long after he has already begun building his enclosures after he was saved by Crusoe from captivity by other savages.

With his head on the ground from gratitude – ‘with all the possible Signs of a humble thankful Disposition’ – Crusoe makes ‘him know his Name should be Friday’ in memory of the day that his life was saved. After a short while his savage servant Friday - who Crusoe considers like a ‘child to a father’ – wants to tell his fellow savages ‘*to live Good, tell them to pray God, tell them to eat Corn-bread, Cattle-flesh, Milk, no eat Man again*’ (Defoe 2007: 189). In brief, Friday is fortunate to have come to Crusoe’s island to be rescued and converted to a more civilized way of life. This is when the tragedy becomes really tragic – not only does Robinson Crusoe lose the edge to his barley innovations because of a mere footstep, which might be characterized as ‘a pity’, he also puts to work those that access his island in order to prevent greater insecurity. Crusoe proceeds to enclose more land and to plant more crops and he gets Friday to beat and sift corn. He observes with approval that Friday

‘soon understood how to do it as well as I, especially after he had seen what the Meaning of it was, and that I was to make Bread of; for after that I let him see me make my Bread and bake it hot, and in a little Time *Friday* was able to do all the Work for me, as well as I could do it my self’ (Defoe 2007: 179).

Not only is this supposedly in *Friday*’s best interest, it requires *Friday* to assimilate and become like *Crusoe*, which is to say wanting to build enclosure and worry about the same predicament. This is the tragedy of having the poor demand their own enclosures – they are to behave in line with something that was set in motion by nothing but a ‘footstep’ which is expected to convince the latecomers about what they need to work on. In other words, when *Friday* arrives to his ‘island empire’ and access to the island gets to be established, the footstep is already set in the field and the enclosures (patents – UPOV91 etc.) are in place on which *Friday* gets to make his contribution to the shared insecurity. Within that trajectory the solution appears to be that of putting crop *genetic* diversity in storage for further science-based breeding to save the poor that get to work on enclosures to protect themselves.

Is it not this that is most ‘anti’ about a tragedy of the anti-commons for crop genetic materials? Surely there are too many property rights that obstruct access but it would be even more tragic when a few corporations could come to own the technologies whereby to make crop improvements that would adapt farming to climate change. Certainly it is possible that the rights to biodiversity, traditional knowledge and the labor of the poor would be recognized in terms of access and in terms of enclosures. Yet it is still a tragedy because these acknowledgements are the consequence of a footstep that has been put and do not discourage the constant inflow of commodified seed and bio-chemical inputs or more mono-cropping.

Lastly, it is a tragedy how self-evident it is that more comprehensive demands for farmers’ and indigenous rights are not possible while it is possible to engage in a comprehensive balancing act of exceptions and reforms that help conclude the trade negotiations centered on a further liberalization of agriculture. However, such a tragedy does not mean that nothing can be done.

It was not the case that within the trespassed boundaries of *Crusoe*’s island-empire it had become impossible to continue working on crop improvements – it is, after all, nothing but a ‘footstep’ that made *Crusoe* a *would-be-barley-inventor*. It is not the case in the novel that *Crusoe* could not innovate any longer after the access of savages to his ‘island-empire’. He remained convinced, as was mentioned before, that were it not for ‘the terror’ he was in he would have ‘undertaken it, and perhaps brought it to pass too’ (Defoe 2007: 140-150).

Consequently the analogy is not finished. *Crusoe* was turning malt into beer and could have made it if he had not gotten too preoccupied with his own wellbeing and would it not have been possible therefore to save *Friday* in order to let him to work on the planting of barley, rice and grapes to make raisins or

turning his barely into malt and beer?

Conclusion

The predicament of Crusoe and Friday relevant as an analogy because it shows a sequence of events that might be circumvented. However this chapter began with a triangle of “access-insecurity-enclosure” wherein Crusoe’s dual problem with access (to his island-empire) and with his need for enclosures came together in how he feels that his safety and his possessions are being threatened by savages coming to his island. As a consequence Crusoe has to give up his innovation-trajectory.

Crusoe worries about his supply of grain as well as the cattle that is his immediate supply of milk and meat. He fears a footstep because it demonstrates that others might access his island and threaten his life and his possessions. After he finds the footprint in the sand, he ask himself: ‘[what] if it should happen so that they should not find me, yet they would find my Enclosure, destroy all my Corn, carry away all my Flock of tame Goats, and I should perish at last for meer want’ (Defoe 2007: 132). He ‘could think but two Ways to preserve them;

‘one was to find another convenient Place to dig a Cave Under-ground, and to drive them into it every Night; and the other was to enclose two or three little Bits of Land, remote from one another and as much conceal’d as I could, where I might keep about half a Dozen young Goats in each Place: So that if any Disaster happen’d to the Flock in general, I might be able to rise them again with little Trouble and Time’ (Defoe 2007: 137).

Consequently Crusoe’s fear makes more and more enclosures necessary – planting thick rings of trees as fortifications and digging caves that are not unlike the proliferation of intellectual property provisions as well as seed banks and vaults against the insecurities of climate change.

The point of the story of Crusoe is that it can be re-read as a much needed warning about the kind of tragedy that is being staged today. Crusoe’s tragedy resembles the monocultures that make contemporary breeding into a tragedy because of how they are outside of the scope of the reform programs that are to save ‘island-earth’ from catastrophic food *insecurities* and other catastrophes – like disease, empty fuel tanks, the weather and so forth. More and more enclosures become necessary but these are no obstacles to the sort of innovation that mobilizes the persuasive insecurity of island-earth as an anti-commons tragedy. The problem with the new enclosures is relative to the dependence on a type of innovation that set in motion such hyperownership in the first place.

Instead of an enclosure of the commons and the tragedies of the commons and anti-commons, what is tragic is a specific alignment of access and enclosures that demonstrates how Hardt & Negri observe that ultimately security ‘is an absolute logic of the common or, really a perversion that conceives the entire common as the object of control’ (Hardt & Negri 2004: 203). It is not for nothing that many of the measures to save the earth are about problems that are happening near to the end of the

twenty-first century; only the food insecurities that happen then require large scientific efforts that need to be exempted from hyperownership at this very moment. This line of argument resembles the suspension of civil law in times of insecurity – the focus on crop *genetic* diversity requires ‘extra-technological’ and ‘extra-legal’ conditions whereby to aim at man’s adaptation to climate change. There is a gene vault that keeps valuable treasure at maximum security in name of humanity and a state of exception for inventors with well-intended humanitarian aim for the world’s problems. This is much like Crusoe who had been hiding in his new enclosures from the savages until he rescued Friday – similarly humanitarian-minded scientists can be mobilized to work on strategically isolated and aligned problems that are global, high-tech and are compatible to patents that are supposed to address the problems of the usual suspects of whatever-what-not insecurity.

If innovation is needed to be ready for when the catastrophes of the future have arrived then it should be of primary concern that every other international treaty is even more complimentary to the already intricate balancing act of access and enclosures. Such attempts to try and rearrange the international organization of genetic materials by way of a balancing act of legal exceptions and reforms that prioritize high-tech science are very problematic because there is no similar humanitarian state of exceptions for the inventions of those that continue to live and work with crop diversity. It might be that more innovation is needed to face the insecurities; its form and shape, however, appears as closely related to the complex and governmental networks around international organizations that are not addressing but transforming demands. They can only acknowledge some demands rather than others and end up re-aligning these in such a way that ‘liberal governance confronts a major problem: the poor cannot always be trusted to make the right decisions’ (Duffield 2002: 129).

More comprehensive farmers’ rights as well as the demands of indigenous peoples are, unlike intellectual property reform, not possible. This is in line with how Friday is staged in Crusoe’s tragedy. When Friday comes along, the footstep has been set, and the three corners of the triangle (access, insecurity and enclosure) are in place. Friday gets to make even more enclosures because his very arrival signals that there is more access to his island, other savages might arrive and threaten both Crusoe and Friday. The point is not that the different types of access and enclosures could not enable the innovation of other groups than scientists – the novel at least suggests that Friday is very inventive in making enclosures and is a most effective companion for Crusoe. Accordingly it is not necessary to get as preoccupied with catastrophes as is decreed by international mandates or to be entirely spellbound by the intricacies of the balancing of access to markets and the enclosures whereby genetic materials are governed. Who’s to say that Crusoe’s breeding and brewing efforts are already off the table because of a footstep and the enclosures that were built afterwards? To put it differently, it is a counterbalance that is

needed – an alternative system whereby to support those that live and work with crop diversity.

After all, Crusoe’s plans were far-fetched to begin with he was missing several of the core ingredients and supplies like yeast and hops as well as a cattle and containers, which is similar to the sort of innovation that is interrupted when modern biological techniques and intellectual property protection are already in place. Also after he had become preoccupied with his life and his possessions Crusoe remained convinced about his innovations. He could have improved his barley and ferment it, and the same applies to the precarious balance between the local innovations of farmer communities and their need to adapt to outside threats like the uniformity of crops used in industrial agriculture and the effects of climate change. In fact the main difference with Crusoe’s predicament is the possibility for a strategic intervention in the tragic sequence of events.

In that regard a ‘freedom to operate’ approach in biotechnology aims to make available ‘crop *genetic* materials’ and the techniques for genetic modification and not the incremental innovations and adaptations of usage, selection, replanting, further breeding that would benefit those that live and work with crop diversity. A counterbalance to this would be to move away from the ‘gene regimes’ – as is the title of this chapter –, which are the various international mandates that aim to regulate genetic materials. This counterbalance requires a move away from a ‘freedom to operate’ for crop scientists to a ‘*free as in freedom*’ approach – analogous to how ‘free software’ and ‘open source code’ make their basic resource freely available to be shared, copied and improved by anyone *on condition that it is released under similar terms*.

Such a ‘free as in freedom’ approach for crop material is not only about open access requirements and collaborative projects that can be frustrated by intellectual property rights. Crusoe as a ‘*would-be-barley*’ grower personifies that the premise for crop materials is somewhat different – to paraphrase the dictum of Richard Stallman of the Free Software Foundation (FSF) – today’s biotechnology is *neither free as in freedom, nor as in free beer*. By analogy to open source in informatics, an approach to plant genetic materials might be possible that could go one step further – to try and support those individuals and communities that would face the insecurity and would continue to live and work with crop diversity *on their own terms*.

This is the topic of the next chapter.

i

See endnote 6.

ii

International undertaking on plant genetic resources for food and agriculture. Nov 23, 1983, Art. 11, available at <http://www.fao.org/ag/cgrfa/IU.htm> – Resolution 8/83 22d Session, Nov 5-23, 1983 hereafter Undertaking.

iii

See <ftp://ftp.fao.org/ag/cgrfa/Res/C4-89E.pdf>

iv

Agreement on Trade Related Aspects of Intellectual property Rights, April 15 1994 Marrakech Agreement Establishing the

World Trade Organization http://www.wto.org/english/docs_e/legal_e/27-trips.pdf see art. 27.

v UPOV is the French acronym for “union internationale pour la protection des obtentions végétales”. See

http://www.upov.int/index_en.html

vi TRIPS art. 27 (b) see footnote 46.

vii Ghijssen (2007: 87-90) refers to the Novartis case wherein a plant variety contained a patented gene. The final decision of the enlarged board of appeal of the EPO in 1999 rule that although the variety as such cannot be patented, because of the prohibition on patents for plant varieties of article 53b in the European patent convention, plants containing a patented gene will be patentable if the gene is not restricted to a particular variety. He also reports that the examination of a plant patent in the US has a lower requirement but a greater scope, in particular on ‘novelty or distinctness’. He makes the interesting observation that ‘the USPTO still grants broad process claims in the case of utility patents on conventional plant varieties which cover the method of crossing the patented plant with any other plant until the 8th breeding generation, which in fact block the breeder’s exemption on the patented varieties. This is the more peculiar in the light of the factual lower requirements for variety patents’.

viii Kastler (2008) reports on a law that passed the French Senate whereby all crop species would follow the example of the collection of royalties on wheat - the Compulsory Voluntary Contribution (CVC). Compensation is then paid by farmers that cannot prove that they purchased certified seeds – that cannot show the receipt; seed companies pick up royalties collectively and split in proportion to their sales. The bill has not been approved by parliament yet but it might imply that ‘any French farmer saving seeds is now vulnerable to prosecution for violating PR, except where a CVC has been paid’ (p. 9).

ix UPOV 1978 Article 5 makes the exception that authorization is required when ‘the repeated use of the variety is necessary for the commercial production of another variety’. See

<http://www.upov.int/en/publications/conventions/1978/content.htm>.

x Hoare & Tarasofsky (2007) report that law on disclosure of origins took effect with the Andean community decision 486 in 2000. Brazil passed laws in 2001, Costa Rica in 1998, Denmark in 2002, Norway and Sweden in 2004 and Belgium in 2005. Hoare & Tarasofsky report that Norway, Switzerland, the European Commission and Brazil have submitted proposals to the WTO and WIPO on the disclosure of origins. Safrin (2004: 666) observes that Bolivia, Brazil, Cuba, the Dominican Republic, Ecuador, India, Peru, Thailand and Venezuela as well as the African Group, China, Pakistan, Zambia and Zimbabwe have at different times made similar proposals. See WTO doc. IP/C/W/403 & 404 at www.wto.org.

xi Safrin goes as far as writing: ‘a rough analogy would be if sovereigns decided to take control of the removal of written words from their countries, under the theory of sovereign rights over the paper within their borders, so that information conveyed by those words could not leave their territory’ (see Safrin 2004: 664).

xii Parry mentions an amount of \$1.135.000 (Parry 2004: 216).

xiii See <ftp://ftp.fao.org/ag/cgrfa/it/ITPGRe.pdf>.

xiv The list seems quite arbitrary and I have tried to find out what made some crops be included rather than others. Of course it is sometimes explicit that certain crops were not included out of perceived national interests in trade but it is rather a mystery to me why strawberries are on the list. Perhaps it is of food safety interest in a way that I do not understand, perhaps it is the result of some political compromise. Nothing more specific is mentioned in the book by Coupe et. al with as its title: Negotiating the Seed Treaty.

xv See “the FAO seed treaty: from farmers’ rights to breeders’ privileges” in Seedling 2005 at

<http://www.grain.org/seedling/?id=411>.

xvi <http://www.croptrust.org/main>

xvii See Hisano (2005) for a more detailed discussion of various examples like Golden Rice, donations of western biotechnologies for African crops and BT cotton.

xviii http://www.goldenrice.org/Content2-How/how9_IP.html see also Kryder et. al 2000.

xix ISAAA stands for the International Service for the Acquisition of Agri-biotech Applications; ETC Group - Erosion Technology and Concentration Group. See ETC Group 2000 at

http://www.etcgroup.org/en/materials/publications.html?pub_id=307

xx See the mission statement of the generation challenge program at www.generationcp.org/.

xxi The initial consortium consisted of: three CGIAR centres, (CIMMYT, IPGRI, and IRRI); two NARS (CAAS, China; and EMBRAPA, Brazil); and five advanced research institutes (Cornell University, USA; AGROPOLIS, France; John Innes Centre, UK; National Institute of Agrobiological Sciences, NIAS, Japan; and Wageningen University and Research Centre, the Netherlands). Later five additional CGIAR centres were added to the consortium: CIAT, CIP, ICARDA, ICRISAT, and IITA as well as WARDIA (sub-Saharan Africa), ICAR (India) and ACGT (South Africa), Centro de Investigación y de Estudios Avanzados (Cinvestav, Campus Guanajuato of Mexico), Instituto Agronomico per l’Oltremare (IAO, Italy), Institut National de la Recherche Agronomique (INRA, Morocco), National Center for Genetic Engineering and Biotechnology (BIOTEC, Thailand) see

<http://www.generationcp.org/gcppartners.php?da=0646141>.

xxii see <http://www.ifpri.org/pubs/newsletters/IFPRIForum/IF200506.htm>,

http://www.cgiar.org/eneews/july2005/story_14.html as well as

<http://www.ifpri.org/themes/ppp/SKEPCoverNote.doc> - which is most illuminating on how negotiations between the CGIAR institutes and multinationals over secrecy clauses because it is available on the internet by accident and was intended only for personal use.

xxiii see ETC (2008) *Patenting the "climate genes"... And capturing the Climate Agenda*. At

<http://www.etcgroup.org/en/materials/publications.html>.

xxiv See <http://www.case.edu/affil/sce/BellagioDec.html> for 'the Bellagio declaration from the 1993 Rockefeller conference 'cultural agency / cultural authority: politics and poetics of intellectual property in the post-colonial era'.

xxv The term "traditional knowledge" refers to "the content or substance of knowledge that is the result of intellectual activity and insight in a traditional context, and includes the know-how, skills, innovation, practices and learning that form part of traditional knowledge systems, and knowledge that it embodies in the traditional lifestyle of a community or people, or is contained in codified knowledge systems passed between generations. It is not limited to any specific technical field, and may include agricultural, environmental and medicinal knowledge, and knowledge associated with genetic resources". See WIPO/GRTKF/IC/5/8, Annex, article 3(2) qt. in Leidwein 2006.

xxvi Pires de Cavalho (2002) distinguishes traditional knowledge in ideas and expressions. The former is about ideas developed by 'traditional communities and indigenous peoples, in a traditional and informal way, as a response to the needs empowered by their physical and cultural environments and that serve as a means of cultural identification'. In addition 'expressions of folklore' might be verbal, musical or active (e.g. tales, music and dance or ritual).

xxvii Originally the G20 was composed of Argentina, Bolivia, Brazil, Chile, China, Colombia, Costa Rica, Cuba, Ecuador, el Salvador, Guatemala, India Mexico, Pakistan, Paraguay, Peru, the Philippines, South Africa, Thailand and Venezuela. Its current membership is 21 and is made up of five countries from Africa (Egypt, Nigeria, South Africa, Tanzania and Zimbabwe); six from Asia (China, India, Indonesia, Pakistan, the Philippines and Thailand); and ten from Latin America (Argentina, Bolivia, Brazil, Chile, Cuba, Guatemala, Mexico, Paraguay, Uruguay and Venezuela) (see Taylor 2007: 155).

xxviii See articles 11, 18 (2), 23 of ILO c. 107 at: <http://www.ilo.org/ilolex/english/newratframeE.htm>.

xxix Art 1b2 and 1b3 ILO c.107 see Sanders 1983: 19 at: <http://www.ilo.org/ilolex/english/newratframeE.htm>.

xxx See articles 11, 18 (2), 23 of ILO c. 107 at: <http://www.ilo.org/ilolex/english/newratframeE.htm>.

xxxi For example there are people in the Amazon that do not identify as a single group or people among other peoples but are still considered indigenous peoples on the basis of sharing common beliefs about culture, an ancestry and religion many indigenous peoples in Africa and Asia have not been colonized and sometimes indigenous peoples have moved or were moved. Rather than defining indigenous peoples with any strict or universal criteria, the moral and liberal philosopher Will Kymlicka's refers to 'an intergenerational community, which is more or less institutionally complete, occupying a given territory or homeland and sharing a distinct language and history' (Kymlicka 1995: 18). Alternatively, the working definition the first special representative at the UN, Martinez Cobo acknowledged at the start of the UN Decade on Indigenous Peoples that any definition should include a 'determination to exist' and others have called this the 'wish to retain a separate identity' (Martinez Cobo 1983: § 379 Kingsbury 1998: 238 & Meijknecht 2001: 87). Its definition reads: 'Indigenous communities, peoples and nations are those which, having a historical continuity with pre-invasion and pre-colonial societies that developed on their territories, consider themselves distinct from other sectors of the societies now prevailing in those territories or parts of them. They form at present non-dominant sectors of society and are determined to preserve, develop and transmit to future generations their ancestral territories, and their ethnic identity, as the basis of their continued existence as peoples in accordance with their own cultural patterns, social institutions and legal systems' (Martinez Cobo 1983: § 379). As Kingsbury argues: 'not only must these criteria be interpreted flexibly; they should be regarded as indicia whose presence strongly supports categorization as an indigenous people' (see Kingsbury 1998: 455).

xxxii See James Boyle, a manifesto on the WIPO and the future of intellectual property Duke L. & Tech rev. 0009. 11

<http://www.law.duke.edu/journals/dltr/articles/2004dltr0009.html>.

xxxiii Treaty on access to knowledge, preamble at http://www.cptech.org/a2k/a2k_treaty_may9.pdf and http://www.sitoc.biz/adelphicharter/adelphi_charter_document.asp.htm.