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**Governing Agrobiodiversity:
A Framework for Analysis of Aggregate Effects
of International Regimes**

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Abstract

This paper outlines a framework for analysis of aggregate effects of international regimes – and demonstrates its relevance in the case of management of plant genetic resources for food and agriculture (PGRFA) in developing countries. Whereas many regime studies have focused on the effectiveness of international regimes – where effects are measured against the norms and rules of the regimes themselves – aggregate effects of international regimes are here measured against a set of criteria developed independently of the regimes. This approach is considered relevant when two or more regimes interact with regard to an issue area, and none of them cover the totality of measures assumed necessary to solve the problems. It is also relevant when there is scope for regime conflict. The management of PGRFA comprises many issues, and in demonstrating the method, one central issue has been selected: access to PGRFA, which is crucial for food security. The paper identifies the international norms and rules pertaining to access to PGRFA in the period 1992–2004, overlaps in their functional scopes, and the interaction among them. From these regime constellations, assumptions on the aggregate effects for developing countries are derived. These assumptions are in turn tested in case studies from the Philippines, where the aggregate regime effects on access to PGRFA are analysed in terms of policy decisions and goal achievements. Finally, the general relevance of the findings for other developing countries is discussed. A key conclusion is that the aggregate effects of the international regimes in question were largely detrimental to access to PGRFA in developing countries throughout the period studied – despite other intentions behind the individual agreements. The result of these developments is an emerging anti-commons tragedy: a situation where multiple actors have the possibilities to exclude each other from access to these vital resources.

1. Introduction

This paper outlines a framework for the analysis of aggregate effects of international regimes – and demonstrates its relevance in the case of management of plant genetic resources for food and agriculture (PGRFA)¹ in developing countries.

Whereas many regime studies have focused on the effectiveness of international regimes – where effects are measured against the norms and rules of the regimes themselves – aggregate effects² of international regimes are in this paper measured against a set of criteria developed independently of the regimes, based on an analysis of the issue area in focus. This approach is considered particularly relevant in situations where two or more regimes interact with regard to an issue area, and where none of the regimes cover the totality of measures that are assumed necessary to solve the problem. In addition, it is a relevant approach when there is scope for conflict between the rules and/or norms of the respective regimes.

Plant genetic diversity is crucial to the breeding of food crops and is thus one of the central preconditions for food security. Access to diverse genetic resources is vital to modern plant breeding, as it provides the genetic traits required to deal with crop pests and diseases, as well as with changing climate conditions. It is also essential for traditional small-scale farming, on which approximately 1.4 billion people worldwide depend for their livelihoods.³ Without genetic renewal, yields will decrease and quality deteriorates. Thus, plant genetic diversity is an indispensable factor in the fight against poverty.

However, the diversity of domesticated plant varieties is disappearing at an alarming rate. For several major crops, the losses in variety have reportedly been up to 80–90 per cent over the past century.⁴ At the same time, interest in the commercial use of genetic resources has increased with the growing economic stakes of bio-technologies, followed by demands for intellectual property rights. As patent systems are costly institutions, the capacity of developing countries to develop and effectively use such systems is limited. There has been much protest against intellectual property rights from the South, along with demands for protecting the rights of farmers and indigenous peoples and ensuring a fair and equitable sharing of the benefits arising from the use of these vital resources.

The international community has responded with several regimes fully or partly pertaining to agricultural plant genetic resources: The Convention on Biological Diversity (CBD), the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) of the World Trade Organisation, and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). These regimes have emerged from differing rationales and interests,

¹ Plant genetic resources for food and agriculture encompass the diversity of genetic material in traditional varieties and modern cultivars, as well as crop wild relatives and other wild plant species used as food, according to the prevailing FAO definition (FAO, 1998). This paper focuses on the management of domesticated PGRFA.

² Aggregate regime effects have been defined as the sum of the national-level effects of the regimes under scrutiny and their interaction (Sprinz, Hovi, Underdal, Rasch and Mitchell, 2004). Aggregate regime effects may strengthen or weaken the implementation of provisions of the respective agreements, and they may cause unintended conflicts between implementation processes derived from different regimes (Andersen, forth. 2007).

³ Approximately 1.4 billion people live in farm families that are largely self-reliant and self-provisioning as to seeds and other planting materials, according to Cary Fowler et al. (in Brush, 2000).

⁴ There are few exact figures on the extent and pace of genetic erosion in agriculture. However, nearly all the 154 countries reporting to the FAO for the Leipzig Conference in 1996 (FAO, 1998) maintained that genetic erosion was a serious problem. In China an estimated 90 per cent of the 10,000 wheat varieties grown a century ago had been lost. In Mexico an estimated 80 per cent of the maize varieties grown in the 1930s were gone.

resulting in more or less different functional scopes, goals and emphases. What they all have in common is that they affect the management of PGRFA.⁵

The case of regimes pertaining to PGRFA is one example of the increasing number of regime constellations where two or more international agreements have overlapping functional scopes related to one and the same issue area.⁶ With these developments comes the need for an analytical grasp of the interaction between overlapping international regimes and the effects. This paper is based on the manuscript for my forthcoming book *Governing Agrobiodiversity: Plant Genetics and Developing Countries* (Andersen, forthcoming 2007). It provides an overview of the method and how the method was used in the case of PGRFA management, with focus on one central issue area: access to PGRFA.

2 Outline of the analytical framework

The independent variables of this study are international regimes pertaining partly or fully to the issue area in focus – including the interaction between these regimes. As a basis for the identification of the relevant regimes, the issue area as such must be specified. Approaches in this regard are outlined in section 2.1. Here, ways to determine the criteria for analysis of regime effects (dependent variable) are also addressed. The framework for analysing regimes, their interaction and the resulting regime constellations is outlined in section 2.2. The dependent variable is the effects of these regime constellations on domestic policy decisions and goal achievements pertaining to the issue area, which is explained and outlined in sections 2.3 and 2.4. Finally, an approach to identifying the mechanisms of influence through which the international regimes affect domestic policies is briefly indicated in section 2.5.

2.1 The issue area, problem analysis and criteria for problem solving

The specification of the issue area constitutes the cornerstone of the analysis. This specification follows four steps:

1. Delimitation of the issue area
2. Specification of its components
3. Problem analysis of the issue area and its components
4. Definition of criteria for the assessment of the regime effects

The latter indicates a normative stance that is considered necessary to establish fixed points against which policies and goal achievements can be measured, and subsequently against which the aggregate effects of international regimes can be analysed.

As this part of the analysis requires a multidisciplinary approach, there are basically two avenues: (a) generally recognized literature that provide these inputs is taken as point of departure, or (b) a research team representing the required disciplines and qualifications conducts the specification. In the case of PGRFA management, it was possible to use existing literature. A widely respected and comprehensive study was published in 1998 (FAO, 1998), which defines the issue area (see footnote 1), provides an in-depth problem analysis based on input from more than 150 countries, and derives problem solving measures which were used as points of departure to define criteria for the assessment of regime effects. In Table 1, the components of PGRFA management are identified and specified, based on this study.

⁵ Following from the TRIPS Agreement, Article 27.3.b, also the international Union for the Protection of New Varieties of Plants, UPOV, has become relevant in this context, as will be further explained below.

⁶ Regime overlap has been defined by Oran Young (1996) as a situation that occurs when individual regimes, formed for more or less different purposes, intersect on a *de facto* basis. It implies that the functional scope of one regime extends into the functional scope of at least one other regime.

Table 1: Components of PGRFA management

| Components: | Definitions and explanations: | Indications of conduciveness: |
|--------------------------------------|---|--|
| <i>In situ</i> management of PGRFA | <p>On-farm maintenance and enhancement of genetic diversity between and among crops.</p> <p><i>PGRFA also refers to wild relatives of crops which are found in in situ conditions – in other habitats than in agriculture – but this study will focus mainly on domesticated resources, i.e. on-farm, for the purpose of feasibility of the analysis.</i></p> | <ul style="list-style-type: none"> • The number of plant varieties per crop grown in the country is stable or increasing. • The amount of land devoted to modern cultivars which are genetically uniform is not increasing without compensating measures. • The number of farmers engaged in <i>in situ</i> management of PGRFA is stable or increasing. |
| <i>Ex situ</i> conservation of PGRFA | <p>Maintenance of seeds and other propagating material outside their natural habitats or on-farm conditions, normally in gene banks</p> <p><i>Ex situ conservation can take place at the local, national and international levels. Co-operation across scales helps to spread the risk of loss.</i></p> | <ul style="list-style-type: none"> • The share of crop varieties conserved <i>ex situ</i> is high and/or increasing, as compared to the total amount of crop varieties. • The number of <i>ex situ</i> samples per variety enables distribution from active collections. • The samples have passport data, are kept under correct temperatures and conditions, and are regenerated as required. |
| Access to PGRFA | <p>Legal entitlement or permission to obtain and use available PGRFA, or in countries or cases where this is not required, the free admission to acquire and use such resources</p> <p><i>The two forms of legislation which normally regulate access are laws on bioprospecting and on intellectual property rights.</i></p> | <ul style="list-style-type: none"> • Access is facilitated so expeditious that it enables breeding response to pests, diseases and other demand. • Bureaucratic hurdles are kept to a minimum for farmers and breeders. • Farmers can afford access to the plant varieties they need, and can save, reuse and exchange them according to their customary practices. |
| Utilisation of PGRFA | <p>The utilisation of a wide spectre of crop species and varieties, covering a broad genetic base</p> <p><i>The difference between this element and in situ management is not distinct in practice. In analytical terms, the former is aimed at conservation and the latter at active use, which is considered the best guarantee against genetic erosion.</i></p> | <ul style="list-style-type: none"> • The number of traditional food crops still in use – other than the staple crops – is stable or increasing. • The number of varieties of traditional crops – including staple crops – used in food production is stable or increasing. • There are efforts to broaden the genetic bases of crops with narrow genetic bases. |
| Benefit sharing | <p>Sharing of benefits from the use of PGRFA with the respective community /ies and the national government by the collector.</p> <p><i>Benefit sharing can also be understood in a broader sense, as sharing between beneficiaries at large and populations of custodians of PGRFA, e.g. in the form of development co-operation. This approach has attracted little attention so far.</i></p> | <ul style="list-style-type: none"> • Farmers are provided with access on preferential terms to improved varieties of plants by recipients of PGRFA. • Participatory plant breeding is taking place in the context of benefit-sharing arrangements. • Monetary transfer is taking place in the context of benefit-sharing arrangements. • Development co-operation supports PGRFA management. |
| Farmers' rights | <p>The rights that farmers have to maintain their practices as custodians and innovators of PGRFA, to be rewarded for their contribution, and to participate in relevant decision-making</p> | <p>In addition to the above indications on access (customary practices) and benefit sharing (reward to farmers), a further indication is:</p> <ul style="list-style-type: none"> • Farmers' representation and participation in relevant decision bodies |

The components listed in Table 1 are considered vital for the maintenance and continued use of PGRFA. The core problems were indicated in the introduction. Due to the page limits for this paper, it would lead to far to elaborate more on problem analysis here. In the right column, criteria on conduciveness pertaining to each of the components of PGRFA management are outlined, based on the problem analysis – as basis for the analysis of effects.

A contentious topic with regard to PGRFA is intellectual property rights, such as patents and plant breeders' rights. The topic is not explicitly included in the list for two reasons. First, the list sets out the elements necessary to provide for sustained management of PGRFA. Intellectual property rights are not required for this purpose, but are more of an influencing factor. This leads us to the second reason: intellectual property rights affect several of the listed topics, and should therefore be analysed within these contexts. For example, intellectual property rights directly affect access to PGRFA, as will be further discussed below, and the scope for farmers' rights. In the following, our focus will, due to the complexity of the issue, concentrate on access to PGRFA.

The specification of the issue area enables the precise identification of international regimes that may affect the issue area, as well as their norms and rules pertaining to the issue area.

2.2 Analysing regimes, their interaction and constellations

When analysing the individual international regimes and their interaction with regard to the issue area in focus, we will take their norms and rules as points of departure.

Several scholars have investigated the interaction between overlapping international environmental regimes.⁷ Rosendal (2001) suggests a method for identifying whether and how overlapping regimes are conflicting or synergetic. She distinguishes between norms and rules of international regimes, and develops a typology for analysing the overlap between the functional scopes of norms and rules of such regimes. This typology is not only useful to identify conflicts and synergies and their significance, but also to enable the analysis of individual international regimes. It is used in a slightly modified version here.

The foundation for applying the method is the *definitions of norms and rules*. The overall policy objectives and principles of an international regime are often formulated in general terms, as a result of long negotiations between parties with differing interests and often also due to interaction with other regime processes. This may make it difficult to grasp the precise contents of the norms contained in these policy objectives and principles. In our context, *norms* are defined as expectations to the behaviour of the Contracting Parties to an international agreement pertaining to the overall objectives of the agreement, and shared by most of the Contracting Parties. As Rosendal (2001) indicates, we can distinguish between core and secondary norms – referring to whether the norms prescribe core or secondary aspects of the regimes.

To grasp core and secondary norms, it is useful to distinguish between different imperative levels. According to Dahrendorf (1964),⁸ norms have an imperative dimension which determine their strength: The expectations converging around a norm may represent a 'must', a 'should' or a 'could'. These three levels of imperative are in fact stages on a gradual continuum between the 'must' and the 'could' options, where the 'should' expectations

⁷ See, for example, Gehring and Oberthür 2004; Rosendal 2001 and 2000; Stokke 2000, 2001a and 2001b; and Zhang 1998.

⁸ In Henecka, 1985, p. 60.

comprise several levels of imperative. We will therefore operate with four levels of imperative, divided into two groups of norms: *Core norms* are defined as expectations concerning what the Contracting Parties ‘must’ or ‘ought to’ do, whereas *secondary norms* refer to what the Contracting Parties ‘should’ or ‘could’ do, pertaining to an overall objective of an international agreement. The latter category would also apply if there are diverging expectations among the Contracting Parties as to the contents of an objective. If it is difficult to distinguish between levels of imperatives, we may also understand secondary norms as clearly subordinate to core norms.

Rules are specified as regulations for state behaviour in terms of implementation. Rosendal (2001) distinguishes between programmatic and regulatory rules: regulatory rules prescribe implementation measures, whereas programmatic rules refer to efforts to enhance knowledge about the issue-area. This distinction is less relevant in our context, since there are few programmatic rules in the regimes under study, and it will therefore not be applied. We will distinguish between core and secondary regulatory rules, where the core rules are the mandatory rules and the secondary rules are formulated as more or less optional to the Parties to the respective agreements.

The most important sources of information for determining norms and rules are the texts of the international agreements themselves. However, although these agreements have been adopted and have entered into force, the content of their norms and rules is in a continuous process of further definition and specification. This in turn means that the identification of norms and rules will have to take into account the decisions from all relevant sessions of the decision-making bodies of these international agreements in a time perspective.

Identifying norms and rules cannot be based on a pure text analysis of provisions and decisions. Interpretation is essential. In the process of interpretation, both the historical and the institutional contexts are central – in addition to analysing the effects of regime interaction:

- The *historical context* reveals the background to the rules and norms – and thereby the background against which they must be interpreted – and provides an account of the time dimension in regime development, which is especially important in analysing regime interaction (Andersen, 2002). The historical context is also important for identifying the driving forces behind regime formation, i.e. the actors who initiate regime formation and who influence the processes most significantly.
- The *institutional context* in which a regime is embedded – or to which it is tied – can be expected to influence the interpretation of the content as well as the strength of enforcement. International regimes are often part of larger institutional frameworks, or they may be single regimes with their own web of ties to various international institutions. Using the classification model on regime types elaborated by Oran Young (1996) as a point of departure, pattern matching between the observations and the classification model is analysed, and inferences as to implications for regime formation and development derived.
- *Regime interaction* refers – in this context – to the effects of other international regimes on the norms and rules of the regime in question. It is analysed partly as an element in the historical context (see above), and partly in the context of mechanisms of influence (see Section 2.5 below).

Once we have identified the norms and rules of the individual international regimes in question through this analysis, the next question will be how to identify the overlaps between them, and the effects for the overall regime constellations.

Rosendal (2001) suggests that regimes can be compatible in terms of norms and rules – a situation with synergetic potentials. They can also diverge with regard to norms and rules – a situation with potentials for conflict. If the overlapping functional scopes are compatible in terms of norms, but diverging as to rules, the potential for conflict is considered high. Conversely, if overlapping functional scopes are compatible as to rules, but diverging as to norms, the conflict is not expected to have serious effects. The worst case is if the overlapping functional scopes of two regimes are diverging with regard to both norms and rules – meaning a case of full conflict. If they are compatible in both respects, on the other hand, there are good potentials for synergies. This is illustrated in Table 2.

Table 2: Overlapping norms and rules of regimes: Scopes for synergy or conflict

| Regime A: | Overlap with norms | Overlap with rules |
|-------------------------------------|--|---|
| Regime B: | | |
| Overlap with norms | <i>Least</i> consequential overlap between the two regimes in terms of synergy or conflict | Quite consequential overlap between the two regimes in terms of synergy or conflict |
| Overlap with rules | Quite consequential overlap between the two regimes in terms of synergy or conflict | <i>Highly</i> consequential overlap between the two regimes in terms of synergy or conflict |
| Overlap with norms and rules | <i>Most</i> consequential overlap between the two regimes in terms of synergy or conflict | |

Rosendal (2001) suggests a further framework for analysing the contents of diverging norms and rules. This framework may as well be used to analyse the contents of compatible norms and rules. In a slightly modified version of her approach, we distinguish between core and secondary norms and rules. The most conflicting case will be if the regimes diverge with regard to core norms and core regulatory rules, whereas the case with the greatest synergetic potential will be when core norms and core regulatory rules are compatible.⁹ This, and the assumed effects of further combinations of overlap, are illustrated in Table 3.

Table 3: Core and secondary norms and rules: Overlaps and scopes for conflict or synergy

| Regime A: | Core rules | Core norms | Secondary rules | Secondary norms |
|------------------------|-------------------|-------------------|------------------------|------------------------|
| Regime B: | | | | |
| Core rules | 1 | 1 | 2 | 4 |
| Core norms | 1 | 2 | 3 | 4 |
| Secondary rules | 2 | 3 | 3 | 5 |
| Secondary norms | 4 | 4 | 5 | 5 |

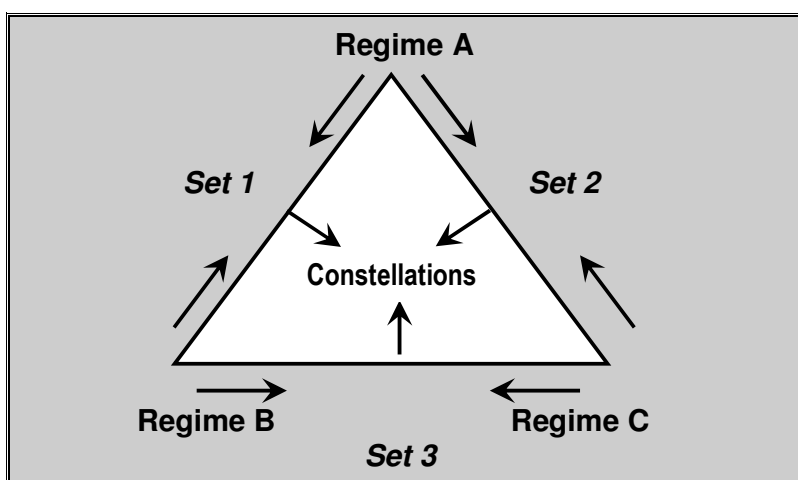
⁹ Whether these potentials are utilised depends on interaction.

Here the potentials for conflicts or synergies are indicated numerically on a scale from 1 to 5, where 1 is the highest and 5 is the lowest potential for conflict or synergy. These numbers express the assumed strength of the effect, whether conflict or synergy.¹⁰

Regime overlap is not static. It evolves and decreases, depending on developments within the regimes in question. In order to understand the effects of regime interaction on the regime constellations, the time dimension is of great importance (see Andersen 2002). In this context, the driving forces behind the interaction, and their mechanisms of influence appear central. This is further elaborated in section 2.5.

In identifying the resulting regime constellations, we will carefully identify all instances of regime overlap between the three regimes according to rules and norms, as they pertain to the management components of PGRFA. This will yield a complex picture of overlapping core and secondary norms and rules pertaining to a range of PGRFA management components. To approach this picture systematically, we will have to analyse the overlaps between two and two regimes, three sets of analyses, before bringing together the findings to the final regime constellations:

Figure 1: Sets of analysis of regime constellations



For each set of analysis, the overlaps will be analysed systematically in terms of core and secondary norms and rules. If we can assume that each regime has two core norms, two secondary norms, two core rules and two secondary rules pertaining to PGRFA, that yields altogether 64 potential items of regime overlap. If we in addition can assume that the figures are the same for all three sets of analysis, we get a total of 192 potential items of regime overlap. However, reality is different. First, not all norms and rules are overlapping between regimes, which reduces the number of items. Second, often more than two norms and/or rules pertaining to PGRFA management can be identified, in turn increasing the number of items. All in all, the systematic analysis of regime overlap appears to be a challenging task: thus, while following the method, we simplifications will have to be sought where possible.

For each of the identified items of regime overlap we will compare the respective norms and/or rules and analyse their contents and scope for conflicts or synergies. Where the overlaps, their contents or scopes for conflicts or synergies have changed during the period under study, this will be addressed.

¹⁰ The table is for purposes of illustration, and cannot be applied on a mathematical basis.

The PGRFA management components are taken as points of departure for analysing the regime constellations pertaining to each of them – i.e. the constellations of norms and rules following from all the regimes in question, and their interaction – with which developing countries have been faced throughout the period under study here. By analysing these regime constellations in the light of the identified mechanisms of influence (see Section 2.5), conclusions can be derived as to the assumed aggregate regime effects for developing countries.

2.3 Dependent variables and the Six Cs Model

The dependent variable is in fact two interconnected variables. Here this decision will first be explained, before the method for tracing aggregate regime effects is highlighted. On this basis, we will outline the framework for analysing the state of policy decisions and goal achievements pertaining to PGRFA management. In Section 2.4 we turn to the question of how to measure effects.

When the purpose is to explain the aggregate effects of international regimes in developing countries, we are interested in effects on policies as well as on the actual situation in the country. This leaves us with two options: either to define the variable as implementation at different levels, or to split them in order to mark the difference between decisions and actual deeds. The first option would be simpler. There are, however, two arguments against using this approach:

- There is often a substantial discrepancy between policy decisions and enforcement in developing countries, and the analytical framework should be able to reflect such observations.
- Second, we are interested in more than the implementation of policies, e.g. initiatives or processes that unintentionally correspond with policy decisions.

Therefore, the dependent variable has been split in two. The first dependent variable is defined as aggregate regime effects on the state of domestic policy decisions pertaining to the management of PGRFA in the case country. The second one is defined as aggregate regime effects on the state of domestic goal achievements pertaining to PGRFA management.

In order to identify the relative aggregate effects of international regimes, the case study approach has been selected as a basic strategy. The method is designed to determine the conditions under which the findings from the case study can have general relevance. The point of departure for determining regime effects is the state of management of the issue in focus. In the example of PGRFA management, we start out by identifying the state of domestic policy decisions and goal achievements pertaining to each of the identified issue components (see Table 1). On this basis, we can trace the processes back to their origins,¹¹ and identify whether, the extent to what, and how, the international regime constellations contributed to the situation. I call the method for these investigations *inductive process tracing*. This is a modified form of what is otherwise known as *process tracing*, which was first described as a method by George and McKeown (1985:35). The way in which process tracing is described in the literature indicates a deductive method. Interviews are undertaken (where necessary) to provide evidence for already established theoretical assumptions or hypotheses on causation or correlation. For the purpose of our analysis, such a procedure

¹¹ *Origin* is in this context a relative term. Probably process tracing can go on forever, as there will always be another reality behind the situation one traces. For practical reasons, in our context *origin* refers to the more immediate sources of explanations, such as international regimes.

could result in a ‘map’ that would not ‘fit with the landscape’, since the ‘landscape’ is a highly complex one. Therefore, we will apply process tracing in an inductive manner, asking open questions to a large number of stakeholders from all sides, in order to reveal all the decisive paths of influence. This means we are not at the outset seeking to establish a causal relation between the international regimes and the identified policies and goal achievements. Instead, we are open for all possible explanations which can enable us to determine the *relative* influence of international regimes.

Before we can trace the relative effects of international regimes in the case country, we need to establish a firm understanding of the state of policy decisions and goal achievements pertaining to PGRFA management during a defined period of time. For this purpose we need to define values; and in a study based largely on qualitative methods – like this one – measurement is a challenge. Values are required for policy decisions and goal achievements with regard to all the identified components of PGRFA management, as illustrated in Table 4.

Table 4: Distinguishing values of the dependent variables

| Core elements in the management of PGRFA: | State of policy decisions pertaining to PGRFA management: | State of goal achievement pertaining to PGRFA management: |
|--|--|--|
| <i>In situ</i> management | (value) | (value) |
| <i>Ex situ</i> conservation | (value) | (value) |
| Access to PGRFA | (value) | (value) |
| Utilisation of PGRFA | (value) | (value) |
| Benefit sharing | (value) | (value) |
| Farmers’ rights | (value) | (value) |

The crucial question is how to determine the values to be filled in. How, for example, can we measure the state of policy decisions pertaining to *in situ* management? A simple point of departure would be to determine whether there are policy decisions pertaining to that (*yes* or *no*). But such a value would not indicate how comprehensive these regulations are for the management of PGRFA *in situ*. Are, for example, all aspects of *in situ* management regulated – or only a few? Nor would it account for the quality of regulation with regard to the particular issue: Is it a case of regulation to protect or even improve *in situ* management of PGRFA, or does it imply a deterioration of the *in situ* management? Furthermore, it would tell us nothing about whether diverging policy decisions pertaining to the respective management elements might be pulling in different directions.

Likewise it is difficult to measure the state of goal achievement. We could distinguish between low, medium and high goal achievement, but applying these values would imply a considerable degree of subjectivity, since what I myself regard as high goal achievement could be medium or low in other eyes. Nor can such a system account for the possibility of negative goal achievement, i.e. a development detrimental to the goals. Therefore we need other measurements.

In the search for a strategy for measuring not only PGRFA management, but the effects of international agreements on the domestic management of PGRFA, it appeared necessary to

develop a model. This model, which I have called the *Six Cs Model on the Measurement of Aggregate Regime Effects*, will be presented and applied in two parts. Part I (the first three Cs) is devoted to measurement on the dependent variables. Part II (the last three Cs) addresses the measurement of the links between the independent and dependent variables (Section 2.4).

The first three Cs in the Six Cs Model on the Measurement of Aggregate Regime Effects stand for *coverage*, *compatibility* and *conduciveness*. These are parameters that will be applied in analysing policy decisions as well as goal achievements in the management of PGRFA. Analysing coverage is necessary to find out whether the policy decision or goal achievement pertains to the whole issue-area or only to parts of it. Analysing compatibility is necessary to find out whether the policy decisions or goal achievements pertaining to the issue-area are pulling in the same direction or in different ones, and whether policies that pull in different directions are conflicting. Analysing conduciveness is necessary to find out whether policy decisions or goal achievements are conducive to the management of the different components of PGRFA. For each of the parameters, a set of values has been developed, highlighted with symbols. An overview is provided in Table 5.

Table 5: Values and symbols of the Six Cs Model, Part I

| Coverage | | |
|---|---------------|--|
| State of policy decisions: Values | Symbol | State of goal achievements: Values |
| Policy decisions cover the respective PGRFA management area highly or fully | A | The goals set out in the policies were achieved to a large extent or fully |
| Policy decisions cover the respective PGRFA management area partially | B | The goals set out in the policies were partially achieved |
| There are marginal or no policy decisions pertaining to this issue-area | 0 | The goals set out in the policies were not achieved – or there were no goals |
| Compatibility | | |
| State of policy decisions: Values | Symbol | State of goal achievements: Values |
| Policy decisions pull in one direction fully or largely, i.e. they are compatible | ⇒ | Goal achievements pertaining to the issue-area pull in the same direction |
| Policy decisions pull in opposite directions, i.e. they are incompatible | ⇔ | Goal achievements pertaining to the issue-area pull in opposite directions |
| Policy decisions pull in different but non-conflicting directions | = | Goal achievements pull in different but non-conflicting directions |
| Conduciveness | | |
| State of policy decisions: Values | Symbol | State of goal achievements: Values |
| Decisions are largely conducive to the management of the issue-area | + | Achievements are largely conducive to the management of this issue-area |
| Decisions are largely not conducive to the management of this issue-area | ÷ | Achievements are largely not conducive to the management of the area |
| Policy decisions are neutral in terms of conduciveness | ≈ | Goal achievements are neutral in terms of conduciveness |

Coverage of policy decisions may refer to two distinct aspects of policies: (1) to their scopes, in terms of the range of regulated sub-issues, or (2) to the degrees of freedom as to the regulation. Which of, and how, these forms of coverage are applied in the analysis is to be explained in detail along the way. In measuring the goal achievement, we will take the policy decisions as our point of departure and ask whether the goals set out in the policies were achieved. In measuring the compatibility of policy decisions, we will seek to identify whether they pull in the same direction. Compatibility of goal achievement will be measured along the same lines. When measuring the conduciveness of the policy decisions, we will again assess all of them, asking whether they are compatible or not, and seek to determine whether the policy decisions, taken together, are conducive to the management of this issue-area. The analysis of goal achievements will follow the same lines.

This first part of the Six Cs Model enables us to grasp the key variables relevant to determining the state of the management of PGRFA within each management area. A range of combinations of values is possible. Some of these combinations indicate that PGRFA – within the respective management area – are taken well care of in the case country; others indicate that they are not. Between these ‘best case’ and ‘worst case’ scenarios there is a range of possibilities. These are outlined in the following table:

Table 6: Combinations of values of The Three Cs Model, from ‘best’ to the ‘worst’ case

| COVERAGE: From the ‘best case’ to the ‘worst case’: COMBINATIONS OF VALUES | Full or high coverage of policy decisions/goal achievements | Partial coverage of policy decisions/goal achievements | Low or no coverage of policy decisions/goal achievements |
|---|---|--|--|
| COMPATIBILITY and CONDUCTIVENESS: | | | |
| ‘BEST CASE’: Policy decisions/goal achievements pull in one direction which is <i>conductive</i> to PGRFA management | $A \Rightarrow +$ | $B \Rightarrow +$ | 0 |
| Policy decisions/goal achievements pull in different non-conflicting directions which are in sum <i>conductive</i> | $A = +$ | $B = +$ | 0 |
| Policy decisions/goal achievements pull in conflicting directions but are in sum <i>conductive</i> | $A \Leftrightarrow +$ | $B \Leftrightarrow +$ | 0 |
| Policy decisions/goal achievements pull in one direction which is <i>neutral</i> in terms of conduciveness | $A \Rightarrow \approx$ | $B \Rightarrow \approx$ | 0 |
| Policy decisions/goal achievements pull in different non-conflicting directions which are <i>neutral</i> in terms of conduciveness | $A = \approx$ | $B = \approx$ | 0 |
| Policy decisions/goal achievements pull in conflicting directions which are in sum <i>neutral</i> in terms of conduciveness | $A \Leftrightarrow \approx$ | $B \Leftrightarrow \approx$ | 0 |
| Policy decisions/goal achievements pull in conflicting directions which are in sum <i>negative</i> in terms of conduciveness | $A \Leftrightarrow \div$ | $B \Leftrightarrow \div$ | 0 |
| Policy decisions/goal achievements pull in different non-conflicting directions , but <i>negative</i> in terms of conduciveness | $A = \div$ | $B = \div$ | 0 |
| ‘WORST CASE’: Policy decisions/goal achievements pull together in one direction which is <i>negative</i> in terms of conduciveness | $A \Rightarrow \div$ | $B \Rightarrow \div$ | 0 |

The exact order of these combinations of values from the ‘best’ to the ‘worst’ case will depend crucially on the contents of the values. As the table combines quantitative and

qualitative measurements, it is not possible to determine the exact order of the value combinations.

The right column has no values because there are no policies or goal achievement to assess, or because these are infinitesimal. A situation without policies may, however, be conducive or less conducive to PGRFA management. (For example, it is better to have no policy than one which is negative to PGRFA management.) Our focus, however, is on the effects of international regimes in the case country. In analysing the context, we will therefore account for the state of PGRFA management regarding the ‘no policy option’.

Exactly how the values are to be determined, ‘grey zones’ interpreted, and the approach be applied in the analysis, need to be explicitly stated along the way.

When determining the state of art, it is not possible simply to fill in the symbols in the first table presented above and draw an average. The different elements of the management of PGRFA have different qualities, and cannot be measured against each other on a mathematical basis. Also the qualitative assessments leading to the choice of the different values in the various settings rule out using such quantitative methods. Instead, we will need to rely on reasoning in order to make conclusions as to the overall state of policy decisions and goal achievement pertaining to PGRFA management in the case country. However, this reasoning will have a solid basis in the measurements undertaken, and will provide a richer picture of the management of PGRFA in the case country.

The *Six Cs Model of Aggregate Regime Effects* does not express the potential variation during the period in question. Seeking to express also the time dimension in the model would have made it too complicated and blurred the main intention, which is to show whether and how the international regimes – and their interaction – affect the case country. We will address the time dimension at three levels: First it will be analysed at the outset of the case study, where all legislation and policies are presented; second it will be dealt with in the analyses of policy decisions and goal achievement pertaining to each of the PGRFA management issues; third, we will include sub-values in cases where policies have clearly changed or where there is a marked change in performance as to goal achievements.

2.4 Tracing aggregate regime effects across scales with the Six Cs Model

The greatest challenge in developing a qualitative case-study design is to provide for causal inferences – linking the dependent and independent variables. In our case, we need to establish causal links between the relevant international regimes, i.e. the regime constellations resulting from the single regimes, their overlap and interaction, and our findings from the case country. Thereby the purpose is to determine as precisely as possible the aggregate effects in the case country, and in order to do this, we need to define exactly what to measure. Again, the definition of values appears necessary in order to provide for optimally exact analysis and for transparency. The effects of international regimes will be identified according to the defined values as shown in Table 7.

The great challenge is to define the values. Again, there are no shortcuts to one value that covers all the aspects of regime effects, as these are multifaceted. The degree to what an international regime affects a particular component of PGRFA management does not indicate whether the effect is in accordance with its norms and rules. For example, provisions of one international regime (regime A) can be developed especially strongly in domestic policy as a response to another regime (regime B). In that case, regime B has a strong effect on the

development of this policy as well, but the policy will probably not correspond with the provisions of regime B. Furthermore, we do not know whether the regime effects are conducive¹² to the management of PGRFA, according to the indications set out in Table 1. It is important to distinguish between correspondence and conduciveness, since international regimes or single provisions under these regimes are not necessarily conducive to the management of PGRFA. There are obviously several dimensions to account for when defining values.

Table 7: Measurement of aggregate effects of international regimes on PGRFA

| Relative effects: ... pertaining to: | Relative effects of the IU/ITPGRFA on the state of: | | Relative effects of the CBD on the state of: | | Relative effects of TRIPS (27.3.b) on the state of: | | Aggregate effects of the international regimes |
|---|---|-------------------|--|-------------------|---|-------------------|--|
| | Policy decisions | goal achievements | policy decisions | Goal achievements | policy decisions | Goal achievements | |
| <i>In situ</i> PGRFA Management | (value) | (value) | (value) | (value) | (value) | (value) | Inference |
| <i>Ex situ</i> PGRFA Conservation | (value) | (value) | (value) | (value) | (value) | (value) | Inference |
| Access to PGRFA | (value) | (value) | (value) | (value) | (value) | (value) | Inference |
| Utilisation of PGRFA | (value) | (value) | (value) | (value) | (value) | (value) | Inference |
| Benefit sharing | (value) | (value) | (value) | (value) | (value) | (value) | Inference |
| Farmers' rights | (value) | (value) | (value) | (value) | (value) | (value) | Inference |

On this background, Part II of the *Six Cs Model of Aggregate Regime Effects* has been developed, addressing the following three dimensions (three Cs) of regime effects:

- *Causation* refers to the degree to which we can ascribe a policy decision or a goal achievement to an international agreement. It is measured against other factors which explain these findings, and which will be identified as we proceed in tracing the causes.
- *Correspondence* refers to the degree to which the identified effects are in accordance with norms and/or rules of an international regime.
- *Conduciveness* refers to the degree to which the effects can be described as positive for management of the particular PGRFA area. It is determined on the basis of the indications of conduciveness set out in Table 1.

How to determine the values within each of these dimensions is the subject of the rest of the section. For the purpose of overview, the values are presented in Table 8 together with symbols which illustrate their contents.

¹² The conduciveness of *regime effects* should not be confused with the conduciveness of the PGRFA management in the country as addressed in the previous section. The effects of the international regime may comprise only a small fraction of the factors explaining the particular policy or goal achievement, and might lead in another direction than the overall conduciveness of PGRFA management in this area.

Table 8: Overview of values and symbols of The Six Cs Model, Part II

| Causation | | |
|--|---------------|---|
| Regarding policy decisions: Values | Symbol | Regarding goal achievements: Values |
| Most lines of influence can be traced back to the respective regime | III | Most lines of influence can be traced back to the respective regime |
| Some lines of influence can be traced back to the respective regime | II | Some lines of influence can be traced back to the respective regime |
| Marginal or no lines of influence can be traced back to the respective regime | 0 | Marginal or no lines of influence can be traced back to the respective regime |
| Correspondence | | |
| Regarding policy decisions: Values | Symbol | Regarding goal achievements: Values |
| Full or substantial match between the policy decision and the regime in question | ≡ | Full or substantial match between the goal achievements and the regime |
| Partial match between the policy decision and the regime in question | - | Partial match between the goal achievements and the regime in question |
| Low or no match between the policy decision and the regime in question | ≠ | Low or no match between the goal achievements and the regime in question |
| Conduciveness | | |
| Regarding policy decisions: Values | Symbol | Regarding goal achievements: Values |
| The effect on the policy is largely conducive to PGRFA management | + | The effect on the goal achievement is conducive to PGRFA management |
| The effect on the policy is largely not conducive to PGRFA management | ÷ | The effect on the goal achievement is not conducive to PGRFA management |
| The effect on the policy is neutral in terms of conduciveness | ≈ | The effect on the goal achievement is neutral in terms of conduciveness |

Exploring in depth all effects of international agreements on policies and goal achievements pertaining to all management areas of PGRFA in the case country would be a demanding task. To delimit the task, a two-level approach has been selected:

- Level 1: Brief assessment of all effects according to documentation of attribution, but without thorough tracing of the lines of causation.
- Level 2: In-depth analysis of the effects with regard to two central policies and their implementation in order to trace the lines of causation in detail (two embedded case studies).

To identify causal relations between international regimes and PGRFA management at the domestic level is basically about tracing lines of influence. By lines of influence, we refer to the stream of influence from an international regime, or a constellation of international regimes, via the actors who transform these impulses into various kinds of action, and to the effect of this action in terms of policy decisions and goal achievements. Distinct lines of influence are, in other words, the streams of influence that can clearly be traced back to their sources, whether these are international regimes (including the actors behind these regimes), or other sources, for example at the domestic level.

For our Level 1 assessment of causation in management areas, however, we need a shortcut to make the investigations feasible. Instead of tracing the lines of influence, we will seek to identify documentation which reveals whether a policy can be ascribed to an international regime. For example, the preamble to an act of legislation may reveal such an ascription. We will also seek to identify documentation on the extent to which goal achievements are ascribed to international agreements. It is important to distinguish between policies and goal achievements in this regard. Whether a policy derived from an international agreement is implemented in a developing country will normally depend on a host of other factors. Also there is the possibility that a grassroots initiative is ascribed to an international agreement, whereas the national policy to which it contributes is not. A crucial question in this regard is to what extent information on ascription is a reliable source for determining causation. Whereas a regulation may be 'marketed' as CBD implementation, there can be several factors explaining why it came to the surface. This means it is important to cross-check documentation with central stakeholders in the form of interviews, and to express uncertainties explicitly.

In measuring correspondence between international agreements and domestic policies, we will simply compare the texts of the international agreements and the national policies as expressed in rules and regulations or in other policy documents.

A similar approach will be used for measuring the correspondence between international regimes and goal achievements. Here we will have to compare provisions of the international agreement with the action that has taken place – not with formulations in documents – in order to determine match. Correspondence does not provide any indication of causation. Whether correspondence is an effect of an international regime will depend on whether there are causal links between the regime and the policy or goal achievement in question. The values suggested in this section can therefore be understood in the context of regime effects only when linked with the values of causation.

The identified effects of international regimes on policy decisions and goal achievements pertaining to PGRFA management can be considered positive, negative or neutral to the management of the issue-area, as compared with the indications of conduciveness set out in Table 1. It is analytically important to distinguish the conduciveness of these effects from the conduciveness of the policies and goal achievements (Part 1 of the Six Cs Model), as the effects may point in another direction than the overall level of conduciveness of the policies and goal achievements. Measuring the conduciveness of various effects will yield a complex picture. For example, one and the same effect can be conducive as to policies on benefit sharing but be negative as to policies on access to genetic resources. When differentiating as to management areas and international regimes, this complexity will unfold, in turn giving rise to the question of how to draw conclusions on the aggregate effects of international regimes.

As in all qualitative analyses, it is difficult to determine the concise values of the variables and of their links. The methodology outlined above seeks to capture the richness and complexity of the situation and the developments under study. Thereby it will serve as a guideline. The quality of the analysis will depend on the explicit expression of all the important considerations determining its use along the way.

It will not be possible to draw inferences from the sets of values indicated above and to aggregate regime effects for PGRFA management on a mathematical basis. Rather, the determined values will serve as basis for inferences and conclusions to be spelled out in detail with regard to contents and importance. The values are solely means to reveal the richness and the complexity of the picture in a consistent, systematic and transparent matter, and thus to ensure the validity of the analysis.

Having analysed the aggregate regime effects as to PGRFA management, we will compare our findings with the assumed aggregate regime effects set out in the analysis of regime constellations and assess pattern matching, in order to verify or falsify these assumptions with regard to the case country. We will also discuss the conditions under which the findings can have relevance in other developing countries, and based on available documentation assess what the findings tell us about the aggregate effects of the international regimes on PGRFA management in developing countries.

2.5 Explaining the findings: Mechanisms of influence

As international regimes do not affect domestic policies through their mere existence, a central challenge is to explain how influence takes place, i.e. how relevant actors influenced the processes, and how this can be explained. Thus we need to identify pertinent mechanisms through which such influence takes place, the *mechanisms of influence*. Only with a precise analysis of the mechanisms of influence is it possible to identify the entry points for improvements or change.

For the analysis of aggregate regime effects on PGRFA management in developing countries, three mechanisms of influence were selected:

- *Structural power*: the ability to shape and determine the structures of the global political economy within which other states, their political institutions, their economic enterprises and their professional people have to operate (Strange, 1988)
- *Learning and norm diffusion*, with emphasis on the influence of *advocacy coalitions*: coalitions of actors sharing a set of policy core beliefs and advocating policy decisions based on these beliefs (Jenkins-Smith and Sabatier, 1993 and 1994)
- *Institutional capacity*: the capacity of the domestic system to respond to international regimes, as well as to pressure and initiatives from various actors in this regard, to balance pressure and initiatives against other interests, to develop policies and to implement them (based on Hanf and Underdal, 1998: 163 and Jänicke 1995).

There are two basic distinctions between the first two mechanisms and the third one. Whereas the first two represent a continuum from the international level to the domestic, the third is limited to the domestic level. In addition, the first two mechanisms are expressions of influence on the system, whereas the third is an expression of, *inter alia*, the system's response to such influence. Thereby, the first two mechanisms are assumed to influence the third in various ways and *vice versa* – in that the response of the political system provides new points of departure for action by influencing actors.

Due to the limits of this paper, it is not possible to present these mechanisms of influence in further depth here, and neither can we elaborate on the findings in this regard. A thorough discussion is provided in the forthcoming book (Andersen, 2007).

As the presentation of the analytical framework for the analysis shows, analysing the effects of international regimes on the management of PGRFA in developing countries is a challenging task – due to the high level of complexity in terms of number of international regimes and their interaction, number of interrelated sub-issues of PGRFA management, the analysis of relative aggregate effects across scales from the international to the national level, and the identification of mechanisms of influence. Probably, analyses of aggregate regime effects on other environmental issue areas will prove similarly challenging. We will now turn to the analysis regarding PGRFA management and show how the method was used. Due to the limits of the paper, only main features can be highlighted.

3. International Agreements pertaining to PGRFA

Three international agreements which pertain to the management of PGRFA in developing countries were identified, a fourth agreement is indirectly relevant, and all are presented briefly in this chapter – as basis for the analysis in the next chapters.

3.1 The IU and the ITPGRFA

The International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) was adopted at the Thirty-first session of the Conference of the Food and Agriculture Organisation of the United Nations (FAO) in Rome on 3 November 2001. It entered into force on 29 June 2004, and is the first legally binding agreement to deal exclusively with PGRFA management. Its objectives are the conservation and sustainable use of these resources, and the fair and equitable sharing of the benefits arising from their use – in harmony with the Convention on Biological Diversity (CBD) – for sustainable agriculture and food security. The most important benefit to be provided from the use of PGRFA is that of access to these vital resources for food and agriculture. The predecessor of the ITPGRFA was the International Undertaking (IU), which aimed at conservation of, and access to, PGRFA. It was adopted in 1983 but was not legally binding.

3.2 The CBD

The Convention on Biological Diversity (CBD) was the first international treaty to address the conservation, sustainable use and equitable sharing of benefits derived from the utilisation of biological diversity in general. It was opened for signature at the UN Conference on Environment and Development in Rio in 1992, and entered into force on 29 December 1993. In its general approach to biological diversity, it did not differentiate between types of biological diversity, such as terrestrial and marine biological diversity or domesticated and non-domesticated biological diversity. Later, the Conference of the Parties established thematic work programmes on various components of biological diversity, one of which is on agricultural biodiversity,¹³ and for which a working programme with timetable and reporting schedule was adopted in 2002 (Decision VI 5 of the CBD Conference of the Parties).

3.3 The TRIPS Agreement

The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) was adopted on 14 April 1994 as one of the three basic agreements on which the World Trade Organisation (WTO) was built.¹⁴ The WTO agreement, which established the new

¹³ The other working programmes address marine and coastal biodiversity, forest biodiversity, the biodiversity of inland waters, and dry and sub-humid lands.

¹⁴ The other two were the General Agreement on Tariffs and Trade (GATT), on goods, and the General Agreement on Trade in Services (GATS), on services. In addition there is the agreement establishing the WTO,

organisation, entered into force on 1 January 1995. The TRIPS Agreement came into effect one year later, on 1 January 1996 (Article 65.1). However, developing countries were entitled to extend their implementation of the TRIPS Agreement until 1 January 2000, and least-developed countries were granted a 10-year extension, until 1 January 2006 (Article 65.2), with the possibility of further extension of the period upon duly motivated requests to the TRIPS Council (Article 66.1).

The TRIPS Agreement provides minimum standards for the protection of intellectual property rights in its member states, and covers such intellectual property rights as copyrights, trademarks, geographical indications, industrial design, and patents. Article 27.3(b) provides that plants and animals other than micro-organisms, and essential biological processes for the production of plants or animals other than non-biological and microbiological processes can be excluded from patentability. The condition is that the members ‘provide for the protection of plant varieties, either by patents or by an effective *sui generis* system or by any combination thereof’. The limits for a *sui generis* system and the meaning of an effective *sui generis* system are, however, not explicitly defined in the text, and there is confusion as to how this shall be understood. The International Union for the Protection of New Varieties of Plants (UPOV)¹⁵ has advocated that the most effective way to comply with the provision of an effective *sui generis* system is to follow the model of the UPOV Convention. Although there are several other approaches to *sui generis* legislation, the trend seems to be for countries to follow UPOV in their implementation of the TRIPS Agreement.

3.4 UPOV

The Convention for the Protection of New Varieties of Plants (UPOV Convention) was adopted in Paris in 1961 to provide uniform and clearly defined principles for the protection of plant breeders’ rights – and it established the Union for the Protection of New Varieties of Plants. It was revised in 1972, 1978 and 1991, with the 1991 version entering into force in 1998. The main difference between the latter and the earlier versions is that farmers are no longer entitled to freely exchange and sell seeds they harvest from varieties protected by plant breeders’ rights. In addition, breeders are required to obtain authorisation from the rights holder for the commercial marketing of a new variety if it is essentially derived from, or similar to, a protected variety, whereas there was earlier an unrestricted ‘breeder’s exemption’ to encourage further breeding. UPOV used to be an organisation for OECD countries; it has become relevant for developing countries only through the TRIPS Agreement.¹⁶ As of August 2004, 17 developing countries were members of UPOV – 15 memberships based on the 1978 Act, and 2 on the 1991 Act.¹⁷

3.5 Different rationales

The different agreements developed out of different rationales. The IU and the ITPGRFA emerged from the FAO, based on a rationale concerning agricultural production and food security. The CBD emerged from an initiative by the World Conservation Union (IUCN) (de

and various additional agreements and annexes dealing with the special requirements of specific sectors and issues.

¹⁵ The abbreviation is derived from the French name of the organisation, *Union internationale pour la protection des obtentions végétales*.

¹⁶ Only South Africa became a member of UPOV before the adoption of the TRIPS Agreement. It joined in 1977, during the Apartheid era.

¹⁷ Since the 1978 Act of UPOV has been closed for signatures, new members will have to adhere to the 1991 Act. Thus, any developing countries joining UPOV will have to accept the conditions of the 1991 Act. Members of UPOV 1978 may apply for membership in UPOV 1991, provided that they fulfil the conditions. In practice, the general trend is in this direction.

Klemm, 1982: 120; McGraw, 2002: 10), based on an environmental rationale, and was negotiated under the auspices of the United Nations Environment Program (UNEP).¹⁸ Both regimes are embedded in the structures of the UN. The TRIPS Agreement as well as the UPOV Convention¹⁹ emerged from business initiatives (Fowler, 1994: 104 and 176–177; Doremus 1996; Yusuf, 1998: 6), but with the joint rationale of creating private incentive structures to promote economic development. Thus, the international regimes all concern PGRFA management in different ways, as shown in Table 9 below.

Table 9: What the international regimes are about (emphases)

| | Conservation, access and benefit sharing | Intellectual property rights |
|--|--|--|
| Biological diversity in general (incl. PGRFA) | CBD | Article 27.3(b) of the TRIPS Agreement |
| Plant genetic resources for food and agriculture | IU/ITPGRFA | UPOV |

4. Regime overlap, interaction and resulting constellations

A thorough analysis of the international regimes and their interaction reveals a rich picture of core and secondary norms and rules, as basis for the further analysis. Focusing on one PGRFA management component, access to genetic resources, we will in this paper turn directly to regime interaction, and highlight relevant norms and indicate some of the rules of the different regimes along the way. In this overview, the main features are presented.

4.1 Regime formation and interaction pertaining to access to PGRFA

When the FAO International Undertaking was adopted in 1983, the USA opposed it because the developing countries were demanding that all types of genetic resources should be seen as a common heritage of mankind, freely accessible for everyone (Fowler, 1994: 188). There was an obvious clash with the intellectual property rights regime then under development in the USA. Several OECD countries were generally sceptical to an international agreement, since they feared the politicisation of the issue (ibid. 186). However, nine years later, the positions were totally reversed due to the emerging intellectual property rights regime being negotiated as part of the Uruguay round leading up to the WTO with the TRIPS Agreement. In the parallel CBD negotiations, developing countries advocated the sovereign rights of States over their genetic resources and the sharing of benefits resulting from the use of these resources, in an attempt to counterbalance the TRIPS process.²⁰ The USA argued against regulating access to genetic resources under the CBD (Rosendal 2000: 92) – but was also in the forefront in establishing the TRIPS regime, which restricted access to PGRFA from

¹⁸ The original motivation was conservation of biodiversity, but during the course of negotiations, the sustainable use of its parts and components and the equitable sharing of the benefits thereof became important parts of the rationale, as we will see below.

¹⁹ UPOV was at its inception a separate regime, but was later linked to the World Intellectual Property Organisation, which is a specialised agency of the UN.

²⁰ Sovereign rights of countries over genetic resources had also been recorded in an agreed interpretation of the International Undertaking from 1991 (FAO Conference Resolution 3/91), in response to an earlier formulation (FAO Conference Resolution 4/89) accepting plant breeders' rights as being in harmony with the Undertaking.

another angle.²¹ This tension spurred the demand from developing countries for regulation of access to *inter alia* PGRFA in order to ensure benefit sharing.

With the CBD, an international regime was created which provided for such a regulation of access and benefit sharing. It was achieved with relatively short negotiation period, in an effort to get the text ready for signature at the Rio Conference (McGraw 2002). As such, it represents a 'snapshot' of the state of negotiations at the time of Rio (Swanson, 1999: 309). The further formation of the CBD has been a continuous process along with its implementation.

In the Nairobi Final Act of 1992, which was the document adopting the text of the CBD prior to its signing in Rio de Janeiro, outstanding issues related to PGRFA were addressed and referred to the FAO for further negotiation. Among these issues was the question of access to gene-bank collections acquired prior to the entry into force of the CBD. Both the FAO and the Conference of the Parties to the CBD called for harmonisation of the International Undertaking with the Convention. These were the points of departure for the lengthy negotiations that led up to the adoption of the ITPGRFA in 2001.

In fact, the new constellations seriously affected the regulation of access to PGRFA (Andersen 2003). There is a basic difference between domesticated and non-domesticated plant genetic resources: Whereas domesticated plant genetic resources depend on human intervention to maintain and develop the properties necessary for their use in agriculture, non-domesticated resources normally thrive best in the absence of direct human intervention.²² Access to genetic resources is a precondition for the maintenance of domesticated resources, but this is not normally the case with regard to the *in situ* conservation of non-domesticated genetic resources. Since the CBD comprised all biological diversity, without paying attention to their differing management needs, problems were bound to arise.

While there were no difficulties in adopting the overall objectives of the CBD, the rationales behind the two agreements differed in their weighting. The International Undertaking was born out of the need to facilitate access to genetic resources. Thus, access to genetic resources was a core norm. The CBD emphasised the need for fair and equitable sharing of the benefits arising out of the use of genetic resources as a core norm, in addition to the necessity of conservation and sustainable use. For a number of reasons (Andersen, forthcoming 2007), access to genetic resources must be seen as a secondary norm under the CBD.

In a PGRFA context, however, the question of access and benefits are different than for other genetic resources:

- An estimate comparing the commercial seed industry with the pharmaceutical sector showed huge differences with regard to the monetary potentials for benefit sharing (FAO, 1998: 290). The benefits to be returned to the source country of a plant-derived pharmaceutical product could, under a bilateral agreement, sometimes reach several million dollars, whereas the benefits to be returned to source countries from the commercial exploitation of PGRFA through plant varieties would hardly cover the respective transaction costs. One reason for this is that a plant variety is normally derived from a huge number of parent varieties, with an even larger number of potential countries of origin, whereas pharmaceutical products are often derived from only one plant variety

²¹ In addition, the UPOV Convention was amended to provide stronger intellectual property rights for plant varieties, a development that was to have implications for later implementation of the TRIPS regime.

²² Measures to conserve their habitats may be necessary.

stemming from one country.²³ The estimates indicated that few monetary benefits can be expected from the commercial utilisation of PGRFA under bilateral agreements.

- For developing countries, the most vital benefit so far has been access to PGRFA. Based on several studies, including a survey undertaken by Palacios (1998), Fowler, Smale and Gaiji (2001) document that individual developing countries in general receive more PGRFA than they provide.²⁴ Therefore, as net receivers of PGRFA, all countries would benefit from the smoothest possible access to these vital resources.
- As long as no monetary or other benefits can be achieved except access to PGRFA, developing countries lose in double terms when they restrict access to PGRFA in order to provide for benefit sharing. They hinder each other in achieving access, and they do not get other benefits in return. Continued access to PGRFA is more vital to present and future food security than any other benefits.

Nevertheless, benefit-sharing arrangements would not be problematic, as long as they did not pose any substantial hurdles to access to PGRFA. This leads us to the second problem arising with the CBD: The way in which access facilitation was regulated. With a bilateral approach, the country of origin of a genetic resource should be the one to control access and benefit sharing, subject to its legislation (Fowler, 2001; Andersen 2001). For wild resources it is normally possible to identify more or less where they originate, also with more than one country of origin. However, domesticated resources have been developed gradually via exchanges between farmers and breeders for hundreds and thousands of years, in several cases even since the dawn of agriculture. Determining the countries of origin of these resources, in accordance with the definitions set out in the CBD, i.e. the countries where they have developed their distinctive properties, is in most cases virtually impossible.²⁵ That in turn means it would be generally impossible to identify the countries that could be rightfully authorised to provide access to them. In addition, plant breeding normally requires access to a huge amount of plant varieties, often from different source countries, and the bureaucratic hurdles of application processes in each country would be substantial. The bilateral approach to access facilitation was simply not appropriate for the purpose of PGRFA.

Thus, one sort of access restrictions, intellectual property rights, triggered another sort of access restrictions, regulation of access to PGRFA for the purpose of fair and equitable benefit sharing. Such a development has been dubbed an 'arms race' (Rosendal, 2006). The result in this case was the steady development towards stricter limitations on access to PGRFA.

²³ Also, plant varieties are under continuous development, and the time period within which one variety may be sold tends to be shorter than that of a successful medicine. In addition, commercial breeders often have well-stocked gene banks on their own, and for a range of crops they tend to be self-sufficient for decades to come (ten Kate and Laird, 1999: 137–142).

²⁴ For example, countries in Southern Africa are between 65 per cent and 100 per cent dependent on main food crops that originated outside the region. Most countries were more than 90 % dependent. Ethiopia, generally considered the richest in PGRFA in Africa, was estimated to be between 28 and 56 per cent dependent generally on PGRFA from other regions. The situation is similar all over the globe, with developing countries depending on PGRFA originating in other regions in the South. Also industrialised countries are net receivers of PGRFA, even if they receive less due to their own well-filled gene banks.

²⁵ Gudrun Henne (1998: 144) argues that the principle of country of origin of genetic resources as the country with sovereignty over these resources introduces a new form of access regulation to natural resources in international law: Countries possessing genetic resources within their territory delegate this right to those that are countries of origin. This may cause problematic situations if the country of origin and the source country are not identical, as is often the case (ibid: 142). For genetic resources which do have an evident country of origin, but where this country of origin no longer possesses the genetic resource, there is actually no legal entity with sovereign rights over that resource (Henne 1998; Wolfrum and Stoll, 1996).

These were some of the major reasons why the negotiations leading to the ITPGRFA lasted for seven years, during which genetic erosion continued unabated. As countries were awaiting the new agreement, little was done to implement the Undertaking at the national level. Additionally, little political attention was given to PGRFA management, or to the FAO International Undertaking. The effect was a lack of political pressure for finalising the negotiations, as well as the use of the negotiations as a scapegoat for postponing action in this issue area. A policy vacuum emerged.

It was not easy to find solutions to the problems outlined above while also keeping the negotiation text in harmony with the CBD. The principle of fair and equitable benefit sharing, central also under the negotiations leading to the ITPGRFA, required a fundamentally different operationalisation approach than that of the CBD. The solution was to be a multilateral system to facilitate access and benefit sharing, established under the new Treaty and covering 35 important crops and 29 forage plants in the public domain of the Parties to the ITPGRFA. This solved the problem of the bilateral approach to access and benefit sharing, but only with regard to the crops on the list. Although those seven years of negotiations were more or less lost with regard to the international regulation of PGRFA management²⁶, the fact that the negotiations finally resulted in a treaty that was legally binding should be seen as a positive effect of the interaction between the International Undertaking and the CBD.

Meanwhile the TRIPS Agreement had entered into effect for most developing countries in 2000, exerting pressure on them to adopt legislation on patents or effective *sui generis* systems to plant varieties. As many developing countries chose to follow UPOV in implementing TRIPS on this point, to ensure that their legislation would be accepted by the TRIPS Council, this came to limit access to PGRFA from another angle.

Plant breeders' rights, as provided for by UPOV, did not stop farmers from using their traditional varieties, and usually did not stop them from using protected varieties in their traditional ways either. Protected varieties could be used as an input to strengthen and improve their own varieties, allowing parts of the harvest to be used for sowing, exchange and sometimes for sale, without paying royalties to the rights holders. However, the UPOV 1991 Act restricts the rights of farmers: governments may, as an optional rule, permit farmers to use protected varieties for propagating purposes on their own landholdings, but not to exchange or sell the seeds or propagating material thereof. As the number of varieties protected by stricter plant breeder rights increases and the number of traditional varieties falls, the total number of varieties available²⁷ for traditional use by farmers will obviously decline, in turn affecting their ability to maintain yields and the resistance of their own crop varieties.

Another effect of the introduction of plant variety protection in a country is that it encourages the sale of improved varieties. In Brazil, for example, Monsanto increased its share of the

²⁶ The greatest achievement during this time was the establishment of the *International Network of Ex Situ Collection under the Auspices of the FAO* (Andersen, 2003). Thereby gene bank collections of the Consultative Group on International Agricultural Research (CGIAR) were placed under the auspices of the FAO, making them accessible for plant breeding and direct use as an interim arrangement until the entry into force of the ITPGRFA. However, countries from which material was received could interfere and demand control over access to the collections from their countries.

²⁷ Fowler and Hodgkin (2004: 145) distinguish between 'access' and 'availability', where 'access' refers to the possibility to get permission or legal entitlements to obtain PGRFA, and 'availability' relates to whether the genetic resources exist in a usable form, can be identified and potentially obtained.

maize seed market from zero to 60 per cent between 1997 and 1999, following the introduction of legislation on plant breeders' rights (CIPR, 2002: 65). Whereas the introduced varieties may have increased and improved production, at the same time they crowded out local varieties, contributing to further genetic erosion and subsequently to reduced availability of PGRFA.

4.2 Aggregate negotiation output pertaining to access to PGRFA

In essence, the negotiation output for each of the single regimes pertaining to access to PGRFA can be summarised as follows:

- The IU provided, and the ITPGRFA provides, for expeditious access to PGRFA as a core norm. Since the entry into force of the ITPGRFA, access is to be facilitated through a Multilateral System for Access and Benefit Sharing referring to a list of crops and forage plants.
- Under the CBD, access to biological diversity is a secondary norm, to be facilitated by the countries of origin of the plants in question upon prior informed consent on mutually agreed terms with the recipients of the material.²⁸
- TRIPS and UPOV regulate access to PGRFA which is patented or protected by plant breeders' rights; they do not provide for regulation of access to other plant material. The development of new varieties to be protected by intellectual property rights depends on the availability of and access to PGRFA.

We may divide the *aggregate* negotiation output as to PGRFA access into three phases:

1983–1993: In this period, the International Undertaking was the only international agreement on the general regulation of access to PGRFA²⁹. It was not legally binding, but provided a normative basis to facilitate PGRFA access across country borders. Towards the end of the period, however, this normative basis eroded due to agreed interpretations that recognised intellectual property rights as provided for by UPOV,³⁰ and emphasising the sovereign rights of states to control their genetic resources (FAO Conference resolutions 4/89 and 3/91)

1993–2004: The international regimes provided for restrictions on access to PGRFA. Two forms of legal restrictions were introduced for national implementation: (1) acts and regulations governing access to genetic resources upon prior informed consent and on mutually agreed terms; and (2) – towards the end of the period for developing countries – intellectual property rights to plant genetic resources (plant breeders' rights and patents). Since the International Undertaking was non-binding and countries tended to await the results of the negotiations towards the ITPGRFA for decisions on PGRFA, there was no counterbalance during this period.

²⁸ The Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising out of their Utilisation, adopted by the Conference of the Parties to the CBD in 2002, confirm this understanding and strengthens it: *Providers should only supply genetic resources and/or traditional knowledge when they are entitled to do so* (Decision VI/24, II/C/16/c/i). It is, however, explicitly stated that the guidelines are without prejudice to the access and benefit-sharing provisions of the ITPGRFA.

²⁹ The UPOV did not really affect access to PGRFA in this period, because important exceptions were made with regard to these intellectual property rights. Plant breeders were allowed to use protected varieties for breeding purposes, and farmers could use the harvest of a protected variety as they wished. Moreover, in this period UPOV was largely an organisation for OECD countries.

³⁰ Intellectual property rights was a highly contentious issue in the FAO, due to their fast expansion in the area of PGRFA since the 1970s.

2004– present: The ITPGRFA provides for facilitated access to 35 food crops and 29 forage plants under the Multilateral System of Access and Benefit Sharing (Articles 10–13). These include such important food crops as rice, wheat, maize, rye, potatoes, beans, cassava and bananas, listed in Annex 1 to the Treaty and frequently referred to as the Annex I crops. Other important crops, among them soybeans, oil palm, cotton, sugarcane, cocoa, groundnuts, most vegetables (including tomatoes), and important tropical forage plants, are not included.

The multilateral system has solved the difficulties involved in facilitated access to PGRFA for some important crops, but not for all, and the future for the international management of the diversity of these resources is highly uncertain. As for the multilateral system itself, its efficiency and effectiveness depends on the more detailed procedures and their implementation.

4.3 Assumed aggregate regime effects concerning regulation of access in developing countries

As we have seen, there are diverging norms between all three regimes with regard to access. The resulting constellations were threefold. From 1993, developing countries were to establish access legislation on genetic resources. As the CBD did not distinguish between domesticated and non-domesticated resources, countries establishing such legislation will most likely have included PGRFA in their general access legislation. From 2000, developing countries were to have established intellectual property rights legislation to plant varieties. There has been massive pressure to follow UPOV in these efforts. Since 2004 they are to include in the Multilateral System the PGRFA of Annex 1 plants under their management and control and in their public domain.

As a result of these regime constellations, the predominant international norms pointed towards restricted access to PGRFA up to 2004. In a counterfactual perspective, we could ask whether the situation would have been different without the CBD. Would countries have introduced access legislation anyway? It will never be possible to answer this question with certainty. As documented in Andersen (forthcoming 2007), we can be quite confident that actors in the case country, the Philippines, would have tried to develop some sort of regulation pertaining to non-domesticated plants for the pharmaceutical sector, but that such a regulation would not have covered PGRFA. It would also most likely not have been by far that strict. There is also reason to believe that some efforts would have been undertaken in Latin-America to regulate access to wild biodiversity, since financial benefits were expected particularly with regard to pharmaceutical products. PGRFA would probably not have been covered by such legislation, because biodiversity was generally associated with non-domesticated plants and animals, and not with PGRFA – until the CBD. The CBD provided a framework for defining access regulation, and was also a source of inspiration. A basic assumption is therefore that it made a substantial difference, not least with regard to the inclusion of PGRFA in access regulation.

The TRIPS Agreement affects access from another angle. Most countries follow UPOV 1991 in their implementation of Article 27.3 (b) of the TRIPS Agreement – more or less. Depending on how this is done, it affects access to PGRFA – more or less. If farmers are not allowed to exchange or sell farm-saved seeds from protected varieties, as provided for in UPOV 1991, it reduces their access possibilities. If farmers are not allowed to use their own farm-saved seeds for the next harvest (optional in UPOV 1991), it also reduces their access to PGRFA. Similarly the reduced possibilities for breeders to use protected varieties of plants, as compared to UPOV 1978, reduce accessibility for breeders. Also here a counterfactual

perspective is relevant: Would developing countries have followed UPOV without the TRIPS Agreement? Probably they would – as a result of bilateral agreements between single countries and groups of countries, the so-called ‘TRIPS plus’ agreements. However, there is reason to believe that the process would have been slower, since it has taken more time to negotiate such agreements on a bilateral basis (Andersen, forthcoming 2007).

The interaction between the three agreements was not conducive to access to PGRFA until the entry into force of the ITPGRFA. We may expect that access to the Annex 1 plants will be easier once the Multilateral System is in function. However, access to other plants remains difficult. For the period studied, we may expect that the aggregate effect of the international regimes pertaining to PGRFA management was reduced legal access to these resources.³¹

5. Tracing the aggregate effects in developing countries

According to a list of specified criteria, the Philippines was selected as a case country. The country was particularly interesting, because it pioneered the implementation of the CBD with several acts of legislation and policies, and because it had been active in the international negotiations pertaining to PGRFA. We will first turn to a brief presentation of the results from the Level 1 analysis in Section 5.1, and thereafter to the Level 2 analyses in Sections 5.2 and 5.3. Finally, we will discuss the general relevance of the findings in Section 5.3.

5.1 Results from the Level 1 analysis with the Six Cs Model

The analysis of the state of policy decisions and goal achievements revealed that the coverage of the Philippine legislation pertaining to access to PGRFA was high. Several policy decisions were relevant in this regard, and two of these were particularly important: The Executive Order 247 on the prospecting of genetic resources and the Plant Variety Protection Act of 2002 (PVP-Act).³² Together these acts covered all PGRFA and most of the users of these resources. Up to 2001, the laws and policies pertaining to access to PGRFA were largely compatible. After this point a new Wildlife Act (2001) and the 2002 PVP Act contributed to diverging norms and rules, as will be further explained below. None of them were however conducive to access to PGRFA, although an intention behind the EO 247 was to facilitate access to genetic resources. As will be further elaborated below, the bureaucratic hurdles established with this policy were not compatible with these intentions.

As the PVP Act came into force by the end of 2002 (it is still in a transition period), goal achievements were assessed with regard to the EO 247 only. The coverage of goal achievements were measured along several parameters, including number of applications filed for access to genetic resources, and number of decisions made with regard to these applications. Also potential out-flagging of research based on genetic resources due to bureaucratic hurdles was considered. Although the number of decisions pertaining to bioprospecting applications was low, and the processing slow, the coverage of goal achievements was considered medium due to the relatively high number of applications filed. Due to the bureaucratic hurdles and long processing time, the goal achievements were not considered conducive to access to PGRFA.

³¹ Whether access is achieved through illegal means is another question, and one which cannot be dealt with here. However, the option should be kept open, since there is not such a long tradition of limitations on access to PGRFA, and most farmers and local people would only be proud to share their seeds and to feel that these are deemed valuable by visitors. Seeds are also easy to export and import because of their size. Finally, information about new access legislation may not be distributed sufficiently in developing countries with scarce institutional and financial resources, so that violators of such legislation may not realise they are breaking the law.

³² These policies are further elaborated below.

After this very brief summary of a comprehensive Level 1 analysis, we will summarise the findings in Table 11, before focusing in more detail on the Level 2 analysis. Whereas the state of policy decisions and goal achievements pertaining to access to PGRFA have been highlighted above (Level 1 analysis), the effects of international regimes on this situation, as referred to in Table 11, for the sake of simplicity, be incorporated in the Level 2 analysis below, i.e. in the embedded case studies of two central policies regarding access to PGRFA: The EO 247 (Section 5.2) and the PVP Act (Section 5.3).

Table 11: State of policy decisions and goal achievements regarding access to PGRFA – and the effects of international regimes

| | State of policy decisions/goal achievements pertaining to access to PGRFA | | | Effects of international regimes on the state of policy decisions and goal achievements | | |
|--------------------------|---|--------------------|---------------|---|------------------|---------------|
| | Coverage | Compatibility | Conduciveness | Causation | Correspondence | Conduciveness |
| Policy decisions | A | ⇒ Since 2001: ⇔ | ÷ | III | ≡ ≠ (IU/TPGR) | ÷ |
| Goal achievements | B | ⇒ | ÷ | II | ≠ | ≈ |

5.2 Level 2 analysis: Philippine regulation of access and benefit sharing

On 18 May 1995, President Fidel Ramos of the Philippines signed Executive Order 247 on the prospecting for biological and genetic resources.³³ The implementing rules and regulations of EO 247 were approved by the Department on Environment and Natural Resources Secretary on 21 June 1996 as Department Administrative Order No. 96–20. The executive order, known as EO 247, entered into effect as the first comprehensive regulation worldwide to implement the CBD provisions on access and benefit sharing.

As its title indicates, EO 247 regulates the prospecting of genetic and biological resources, and thus also of PGRFA. It covers all forms of bio-prospecting – whether it takes place in the public domain, on private property or on ancestral lands; is undertaken by local or foreign individuals, entities or organisations; or whether the results are to be used for the public good or for private commercial interests. EO 247 also addresses the traditional uses³⁴ of biological and genetic resources by indigenous and local communities which are exempted from the requirements posed in the Order.

In general, the Order provides that bioprospecting can be accepted only upon the approval of an application for a research agreement between the collector(s) and the government, specifying minimum terms concerning *inter alia* limits of samples to be collected, information requirements, technology co-operation and benefit sharing and environmental protection. To implement the Order, the Inter-Agency Committee for Biological and Genetic Resources (IACBGR) was established, located at the Protected Areas and Wildlife Bureau (PAWB) of the Department of Environment and Natural Resources (DENR) of the Philippines.

³³ Full title: *Prescribing Guidelines and Establishing a Regulatory Framework for the Prospecting of Biological and Genetic Resources, Their By-Products and Derivatives, for Scientific and Commercial Purposes, and for Other Purposes*

³⁴ According to EO 247 (definitions), *traditional use* refers to the customary utilisation of biological and genetic resources by local communities or indigenous people in accordance with written or unwritten rules, usages, customs and practices traditionally observed, accepted and recognised by them.

The procedures for obtaining a research agreement as outlined in EO 247 and its implementing rules and regulations were quite demanding for an applicant, including many steps of communication with the IACBGR. Various documents needed to be prepared, and an environmental impact assessment conducted in addition to a research proposal and a certificate of prior informed consent – the latter takes at least 60 days and involves considerable effort. An exemption was made for collection for conservation purposes, in that these activities do not require prior informed consent (Swiderska, Dano and Dubois, 2001: 32). Nevertheless, applications for such activities still needed to be conveyed to the IACBGR, and were subject to benefit-sharing arrangements.

The required procedures were also time-consuming. According to a note by the Technical Secretariat of the IACBGR,³⁵ a speedy handling of the evaluation and decision process would at best take five months. This is a highly optimistic assumption, given the institutional capacity of Philippine state institutions. The estimate does not include the work of the applicant. In a breeding context, five months is a long time, on the border of being acceptable in view of the need to respond to crop pests and diseases from season to season. In fact, much more time was actually needed. In addition, strict requirements with regard to minimum terms for research agreements constitute hurdles to bioprospecting for PGRFA.

Only five out of 40 proposals were signed between 1995 and 2002 (Liebig et al, 2002: 36), none of which related to domesticated PGRFA. The processes took from one to four years. Most applicants (actual as well as potential) considered the bureaucratic procedures too burdensome (see e.g. Swiderska, Daño and Dubois, 2001; Liebig et al, 2002; Benavidez, 2004). The result was that applicants withdrew their applications, ended their collaboration agreements in the Philippines, or stopped responding to the inquiries of the IACBGR. Many potential applicants probably did not even try. Some of these, perhaps many, simply continued their practice without seeking approval – some knowingly, and others because they were not informed about the Order. Others again decided to turn to other countries in South East Asia for access to genetic resources (Liebig et al. 2002).

With all the efforts to ensure benefit sharing, a crucial question is whether the EO 247 actually accomplished this. The regulation provided a sophisticated system for benefit sharing, covering a wide variety of benefits and beneficiaries over a broad time span. In a few cases there were some examples of benefit sharing, but no actual or potential benefits were achieved with regard to plant genetic resources for food and agriculture. And why? From my interviews with all kinds of stakeholders,³⁶ my impression is that EO 247 was either not known, and therefore not followed, or deemed too demanding for the purpose of plant breeding, and therefore in some cases ignored. However, there is also the possibility that project ideas were not pursued due to the barriers posed by EO 247, as perceived by breeders. Thus, we can conclude that, in terms of PGRFA, EO 247 was much ado about nothing. It obstructed access to PGRFA without giving anything in return. Despite the best intentions, this result was not in line with the CBD.

On the other hand, we should keep in mind that EO 247 was the very first attempt to implement the provisions of the CBD on access and benefit sharing, and was as such a pioneering work. Since then, lessons have been drawn and assessments carried out. The

³⁵ Technical Secretariat of the IACBGR (2001): Status of Executive Order 247 Implementation. Internal brief received during a visit at the Secretariat/PAWB in 2002, p. 7.

³⁶ In May 2000 and March 2002, talking with approximately 80 stakeholders in the Philippines.

resultant Wildlife Act represents a simplification of the rules, but without including PGRFA. It thereby produced a new problem: it has replaced EO 247 with regard to non-domesticated biological and genetic resources, but not PGRFA. Great confusion remains about the legal status pertaining to access to PGRFA, and whether EO 247 still applies. However, that issue is beyond the scope of the present paper.³⁷

The story of Executive Order 247 is the story of a bottom-up initiative by a small group of scientists.³⁸ It built an advocacy coalition with civil society organisations, particularly environmental NGOs, and key people in relevant government agencies, and worked strategically towards a fully fledged regulation on access and benefit sharing of biological and genetic resources in the Philippines. Whereas this strategy proved successful with regard to the adoption of the policy – the advocacy coalition ‘won’ the EO 247 – it was not conducive to a sustained policy on access and benefit sharing, since it failed to take into consideration the perspectives of the target group of the regulation – the bio-prospectors themselves.

Normally, balancing the views of different stakeholders would be the responsibility of the government institutions in charge of the process. However, in this case the central government officials were part of the advocacy coalition, and the mediating role was not sufficiently attended to. Due to weak institutional capacity, implementation was dependent on their presence. After the 1998 elections, central government officials were replaced, resulting in a drastic deterioration of performance in implementing EO 247. Due to these factors, there was no real future for EO 247.

The CBD provided the rationale for core actors in the formulation of EO 247, and was the most decisive factor for the development of the document into a fully fledged regulation, including the signature of the President. It became the framework for the advocacy coalition and was also a driving force for central leaders in relevant government agencies who were part of this advocacy coalition. The main motivation was to provide for benefit sharing – for the benefit of the nation and the conservation of its natural resources, as set out in the CBD. This motivation was additionally spurred by resistance against the TRIPS agreement among core actors, who saw bio-prospecting and intellectual property rights as closely interlinked. With this background, benefit sharing was promoted, to the detriment of access to genetic resources – which also reflects the distinction between these two norms in the CBD.

Few actors with specific responsibilities for PGRFA management participated in the decisive phases of formulating the new regulation. Most of them did not participate at all. In addition, actors involved in PGRFA management did not realise the potential implications of the new regulation. There was no awareness of the differences between the two categories of resources with regard to the different management approaches required to maintain them. This lack of awareness was related to the general perception that the IU was not in function, and that no new domestic steps could be taken until a new international treaty on PGRFA was in place. The CBD was therefore the sole basis from which the Executive Order was derived, and it did not specify any differences between the PGRFA and other genetic resources. The CBD did not help avoid the problem, but rather encouraged it, by merging the PGRFA with other genetic resources – without any distinction between them as to management issues.

³⁷ See Andersen, forthcoming 2007, for a more detailed presentation and analysis.

³⁸ The rest of this section is based on Andersen, forthcoming 2007.

5.3 Level 2 analysis: plant breeders' rights in an access perspective

The Plant Variety Protection Act (Republic Act No. 9168)³⁹ was approved by President Gloria Macapagal Arroyo on 7 June 2002. Its implementing rules and regulations were adopted on 24 February 2003 as Administrative Order 07 of the Department of Agriculture of the Philippines.

The overall goal for the Plant Variety Protection Act (PVP Act) is to contribute to food security in the Philippines (Section 2). For this purpose, the Act provides for the protection of exclusive rights over plant varieties to breeders who have bred them, particularly when beneficial to the people. The basic assumption is that the protection of plant breeders' rights will contribute to higher levels of food security. This is a controversial assumption in the Philippines, and there are good arguments for as well as against it.

The PVP Act is the Philippine answer to the TRIPS Agreement Article 27.3(b). Plant breeders' rights are introduced as a means to encourage the participation of private enterprises and to provide incentives to necessary investments in developing new plant varieties, and to secure exclusive rights of scientists and other 'gifted citizens'⁴⁰ to their intellectual properties and creations. A breeder is defined as the person who bred or discovered and developed a new plant variety, or his/her employer (Section 3c). The act is to be implemented in a way which is supportive to the obligation of maintaining a healthy ecology in accord with the rhythms and harmony of nature.

Any breeder – foreign or Filipino – may apply for a Certificate of Plant Variety Protection (Section 17). If the country of nationality of the foreign citizen or company affords similar privileges to Filipino citizens, the Act obliges the Philippine authorities to issue a Certificate of Plant Variety Protection, provided that the conditions in the Act are met (Section 23, national treatment). It is generally accepted that this reciprocity benefits foreign parties in the Philippines, as Philippine breeders are normally not in a financial and institutional position to use the system abroad.⁴¹ Also in the Philippines, Philippine breeders will normally need to be subcontracted by an international corporation in the country with more financial and institutional capacity in order to protect a plant variety – which means they will then have to share the benefits with that corporation.

The criteria for granting a Certificate of Plant Variety Protection follow the UPOV guidelines of novelty, and genetic distinctness, uniformity and stability. It is generally recognised that these criteria are hard to fulfil for farmer breeders in the Philippines, who will therefore not be in a position to use the system for their own breeding efforts.

Holders of Certificates of Plant Variety Protection have the exclusive right to authorise the production and reproduction, conditioning for the purpose of propagation, offering for sale, selling or marketing, exporting, importing and stocking for any of the mentioned purposes (Section 36). This right includes harvested material (Section 38). Following UPOV 1991, the right also extends to varieties which are not clearly distinct from the protected variety, and essentially derived varieties (Section 39). These rights imply extensive possibilities to exclude

³⁹ Full title: *An Act to Provide Protection to New Plant Varieties, Establishing a National Plant Variety Protection Board and for Other Purposes*

⁴⁰ 'Gifted citizens' is the wording used in the Philippine act.

⁴¹ Based on approximately 80 interviews with stakeholders from all parties in the Philippines in May 2000 and March 2002.

others from the use of the variety in addition to similar varieties, compared to traditional plant breeders' rights as provided for in UPOV 1978 and earlier.

As provided for in UPOV 1991 (optional), there are exemptions to the rights of plant breeders in the PVP Act (Section 43). These are, however, wider than in UPOV 1991. As in UPOV 1991, acts done for non-commercial and/or experimental purposes are exempted. Also in line with UPOV 1991, acts done for breeding other varieties are exempted in the PVP Act (Section 43), if these new varieties are not essentially derived from the protected variety and are clearly distinguishable from it. The difference from UPOV 1991 lies in the wording as well as the exemptions for small-scale farmers. The farmers' tradition of saving, using, exchanging, sharing and selling their farm produce is termed a *right*, and is exempted from the rights of the plant breeders, as long as a sale is not for the purpose of reproduction under a commercial marketing agreement. This exemption also extends to the exchange and sale of seeds among and between farmers, if done for reproduction and replanting in their own land. In contrast, UPOV emphasises that the legitimate rights of the breeder must be protected, and makes it optional for governments to permit farmers to reuse their harvest from protected varieties for propagating purposes on their own landholdings, but not to exchange or sell such material.

However, a National Plant Variety Protection Board is to decide the conditions upon which the exemptions are to apply. It is to be headed by the Secretary of the Department of Agriculture and is composed of the directors of the central government institutions concerned with agriculture and the seed industry, the President of the Philippine Seed Industry Association (private business representative), and two representatives from civil society. One of the latter representatives is to be nominated by the Secretary of Agriculture from a federation of small farmers' organisations; the other representative is to be nominated by the National Academy of Science and Technology from the scientific community. The composition of the board and the procedures for nominating the representatives from civil society are controversial, because the nominations are not to be made by civil society as such.

An important question with regard to legislation on plant breeders' rights is how to establish an overview over *prior art* – plant varieties already existing – in order to ensure the novelty of a plant variety for which a Certificate of Plant Variety Protection is applied, and that farmers' varieties are not illegitimately protected. Farmers are made responsible for registering their own varieties, and the burden of proof rests with them and their organisations. They will have the work and costs involved in establishing community inventories, informing the registrar, obtaining and reading the Gazette, and filing opposition when necessary. In such cases, they will have to prove that the variety existed before the issuance of the Certificate. Proving that may be difficult, since one criterion for novelty is that the variety has been 'discovered' and 'developed', and it is uncertain how much or little a breeder must add in terms of novelty to qualify for a Certificate.

Implementation of the PVP Act is still in a transitional period. The institutional infrastructure is under development, workshops have been conducted to inform potential applicants of their options and procedures, and provisional Certificates have been issued (Golez, 2004: 20–23). There is as yet little empirical evidence as to how the Act will affect access to PGRFA in the Philippines. However, it is possible to reason on the basis of its provisions and experience from other countries – assuming, of course, that the Act is in fact implemented according to its intentions.

The PVP Act can be expected to be conducive to the introduction of new varieties of plants in the Philippines by seed companies with the financial capacity to apply for Certificates of Plant Variety Protection and to uphold these Certificates through payment of annual fees. It may increase accessibility to such varieties for farmers who can afford them. Under favourable environmental conditions, this might increase productivity – particularly important, given the rapidly growing population in urban areas.

For small-scale breeders in the Philippines, including farmer breeders, the Act is likely to represent a challenge. They would normally not be able to afford expensive seeds or have the financial capacity to make use of the system. Their access to protected varieties for breeding purposes would be more restricted than before, and they would have the burden of proof in cases where their own plant varieties were protected by others who ‘discover and develop’ them. For farmers, the new legislation must be said to represent a limitation of their rights to make use of PGRFA, compared to the situation earlier.

An increased market share of improved plant varieties – following from the Act – could help increase food production under the right conditions, but would also contribute to the replacement of traditional or more locally bred varieties, leading to a lack of access to such varieties. Such a situation would particularly affect the large majority of farmers who cannot regularly afford expensive licensed seeds and propagating material, and who depend on access to a wide diversity of PGRFA.

The act has no cross-references to EO 247 or provisions pertaining to the disclosure of the source of parent varieties used for the new plant variety to be protected. Although such options were thoroughly discussed and proposed in several drafts, with references to the CBD and the FAO, none of these attempts succeeded. Theoretically, the Philippines had an opportunity to develop such a *sui generis* system in response to the TRIPS Agreement – but ended up with an act which was almost an exact copy of UPOV 1991.

Again it is important to know the story behind the legislation, in order to understand how this situation came about, i.e. why the Philippines did not make use of this opportunity to ensure some sort of balance between the equity aspects of intellectual property rights and the effectiveness of this system.

The story of the Plant Variety Protection Act is a story about how an initiative for a genuine *sui generis* system in the Philippines was changed into an attempt to make the Philippines a member of UPOV’91, and how a foreign power had a crucial influence on that process. In my field work in the Philippines I traced and documented how the US Agency for International Development (USAID) intervened in the process to link it towards UPOV’91, and succeeded. There were allies and supporters, but USAID was the main actor.

In short and very broadly,⁴² from 1995 to 1999 various Philippine Congress representatives worked on a *sui generis* system for plant variety protection which sought to integrate concerns of equity derived from the CBD and with reference to the FAO. Specifically, applicants for Certificates of Plant Variety Protection would have to disclose the sources of the parent varieties to the new plant, and document prior informed consent by those who provided them with the material. There were also several other suggestions on how to ensure equity.

⁴² This history is long and nuanced, and documented in detail in Andersen, forthcoming 2007.

In 1999, a fully revised draft was proposed, almost identical to UPOV 1991. The bill was proposed by a Senator, but had been drafted by a consultant of AGILE. AGILE stands for Accelerating Growth, Investment, and Liberalisation with Equity, and was a programme under USAID. AGILE was set up in 1997 to provide technical services to Philippine counterparts in terms of training, consultants and production of information materials.⁴³ The overall goal was to revitalise the economy and transform governance, in order to accelerate sustainable growth. Towards this end, several outcomes were defined, including increased competition in agriculture and trade.⁴⁴ The latter is the outcome towards which the AGILE engagement in the plant variety protection act was directed.

The main implementing institution of AGILE was the US-based consultancy firm, Development Alternatives, Inc. (DAI), subcontracted by USAID. DAI in turn established satellite offices in at least 14 government agencies in the Philippines, including the Department of Agriculture.⁴⁵ For these offices, DAI subcontracted several Philippine consultants.⁴⁶ The DAI consultants in the Department of Agriculture worked as employees of the Department and represented it in various external contexts, but were paid by DAI and reported to DAI.⁴⁷ Among their main tasks was to ensure the adoption of a PVP Act.⁴⁸ This is how DAI reported about its experiences in the Philippines:

The key to DAI's strategy in the Philippines is to separate PVP from controversial issues of GMOs and the rights of indigenous communities. These issues are governed by separate legislation that requires environmental clearances before GMOs can be tested or marketed and that protects the rights of indigenous groups. DAI took key officials and congress persons to Argentina and the United States to learn about PVP programs and legislation. The Filipino Congress is expected to pass the PVP law within the next months. Anticipating the passage of the law, DAI staff have been preparing the ground for its implementation by helping the Department of Agriculture develop rules and regulations, and establish the PVP board, which is responsible for registration and enforcement of breeders' rights. (Kent and Bash, 2000)

Short before the signing of the Administrative Order of the new act, Philippine newspapers got hold of the story of AGILE and how it had been influencing Philippine politics. In a Senate meeting on 18 February 2003, Senator Ralph Recto disclosed that AGILE maintained satellite offices in a range of central government agencies and lobbied for the passage of several laws.⁴⁹ Senator Sergio Osmeña raised concern over AGILE's threat to the country's

⁴³ Embassy of the United States in Manila (2003): U.S. Embassy Statement on Agile, at: <http://manila.usembassy.gov/wwwhagil.html>

⁴⁴ AGILE (2001): AGILE Concise Work Plan 2001–03 Showing Linkages With The Medium Term Philippine Development Plan For 2001–2004 And the July 2001 State of The Nation Address. Internal document obtained at USAID.

⁴⁵ According to the brochure *AGILE Accelerating Growth, Investment and Liberalization with Equity*, produced by AGILE.

⁴⁶ According to an interview with a DAI consultant at AGILE in March 2002, and confirmed in *The Manila Times*, 28 February 2003: 'AGILE: The basic facts', by Rene Q. Bas, at: <http://manilatimes.net/others/special/2003/feb/28/20030228spe1.html>

⁴⁷ This is self-experienced (documented in Andersen, forthcoming 2007).

⁴⁸ According to the DAI Statement of Work for November 2001 (p. 50), a 'key expected accomplishment' of the work in the area of intellectual property rights was 'Plant Variety Protection (PVP) legislation enacted by February 2002'. The DAI Statement of Work is an internal publication for AGILE in the Philippines, received at USAID.

⁴⁹ See for example *Daily Tribune*, 19 February 2003: 'US funded lobby group rapped for espionage'. Article by Angie M. Rosales.

sovereignty, noting the powerful influence of its agents on the administration of the President of the Philippines. He claimed that AGILE was crafting various legislation that involved foreign interests, and asked whether his country was again becoming a US colony.

In a Senate Hearing on 19 February 2003, Senator Manual Villar said that it was only now that he realised that all the bills that had been given priority in the Legislative-Executive Development Advisory Council had been sponsored by AGILE. Now he understood why so little attention had been paid to bills on health, education and other topics that matter to the people.⁵⁰ Also Senator Osmeña claimed that he had not been aware of AGILE's strategy, and that he felt duped. He demanded that the subversion and infiltration of the bureaucracy, particularly connected with policy formulation, be investigated.⁵¹ The Senate called AGILE officials to the hearing, but these claimed protection through an old law from 1952 that provided diplomatic immunity.

On 26 February, US ambassador Ricciardone went out in the media claiming that AGILE had rendered services to Philippine senators, including those attacking the group, by providing technical assistance in their legislative work. He, however, declined to mention any names.⁵² This was considered a threat and provoked harsh criticism in the media against the US ambassador. Soon after, the topic disappeared from the Senate – and from the newspapers. Nothing was done to address the acts that had been lobbied by AGILE. Today AGILE no longer exists, and all references to the programme have been deleted from the home page of the US embassy, except for one statement.

Whereas the US embassy holds that AGILE was a joint project between the governments of the USA and the Philippines,⁵³ and that the assistance was demand-driven,⁵⁴ the above documents a different situation – one of intervening in internal processes in the Congress of the Philippines. From June 1998 until June 2003, the US Congress earmarked a total of USD 41,212,527 for AGILE – covering all its work in the fields of politics in the Philippines.⁵⁵

We see that there were strong and powerful foreign interests involved in the process that led to the adoption of the PVP Act and its initial implementation. As documented in detail in Andersen (forthcoming 2007), these interests effectively weeded out all references to prior informed consent, benefit sharing, and other provisions that had been proposed to ensure an equity dimension in the new Act (referring particularly the Convention on Biological Diversity). Thereby they used the TRIPS Agreement as leverage, and argued that UPOV-compatible legislation would be the only safe way to ensure that the TRIPS Council would accept the Act as Philippine compliance with Article 27.3(b).

⁵⁰ *Daily Tribune*, 20 February 2003: 'BAP chief's firm linked to AGILE-USAID-DAI funds'. Article by Angie M. Rosales.

⁵¹ *Manila Times* Internet Edition, 21 February 2003: 'Senators ignore USAID exec's defense of AGILE'.

⁵² *Daily Tribune*, 27 February: 'Senators rap Ricciardone as AGILE protector'. Article by Angie M. Rosales.

⁵³ Embassy of the United States in Manila: U.S. Embassy Statement on AGILE, at: <http://usembassy.state.gov/posts/rp1/wwwhagil.html>

⁵⁴ In the AGILE brochure *AGILE Accelerating Growth, Investment and Liberalization with Equity*, published by USAID and the Republic of the Philippines.

⁵⁵ Information previously available from the DAI website at http://www.dai.com/projects/text_only/asia_text_only/agile_text_only.htm printed out on 20 February 2003 (no longer available on the Internet).

5.4 Aggregate effects of international agreements and general relevance

It was assumed that the aggregate effect of the international regimes in question would be increasingly limited access to PGRFA in developing countries. In the Philippines these assumptions were supported by our findings, and we could trace the main lines of influence back to the TRIPS Agreement, UPOV, the CBD and their interaction. The access legislation, which is considered one of the strictest in the world, was derived largely from the CBD by actors who sought a strong counterweight to the emerging intellectual property rights, and therefore emphasised those parts of the CBD seen as useful for this purpose. Combined with weak institutional capacity for the implementation of regulations, the result was dramatically decreased legal access to PGRFA for foreign as well as Philippine breeders. Not all breeders were aware of the new legislation and continued to utilise traditional varieties at times. It is difficult to measure the impact of the legislation in practical terms, since data are scarce and we do not know how many breeders and conservers refrained from accessing PGRFA because of the legislation (as the case was for several pharmaceutical firms). For Philippine breeders the situation became particularly difficult after the introduction of plant breeders' rights, for which they generally lack the financial means and institutional capacity to apply, and which will strengthen the position of foreign companies in the Philippine seed market. For local farmers, the access situation remains unclear, since new legislation on plant breeders' rights leaves substantial scope for interpretation with regard to terms and conditions for exemptions regarding farmers' practice of saving seeds and propagating material from protected varieties and to exchange and sell such material. All in all, the influence of the international regime constellations on the facilitation of access to PGRFA in the Philippines has been substantial – and negative.

A similar situation is found in other developing countries as well. As shown in Table 12, various forms of access and benefit regulations have been or were in the process of being adopted in 43 countries as of 2004 (ten Kate and Laird, 1999: 16; GRAIN 2004).

Table 12: Developing countries with, or in process of adapting, CBD-related regulation on access to genetic resources as of 2004

| Asia | Africa | Latin America | Pacific region |
|----------------|--------------|---------------|------------------|
| Bangladesh | Cameroon | Argentina | Fiji |
| India | Eritrea | Belize | Papua New Guinea |
| Indonesia | Ethiopia | Bolivia | Samoa |
| Korea, Rep. of | Gambia | Brazil | Solomon Islands |
| Laos | Ghana | Colombia | |
| Malaysia | Kenya | Costa Rica | |
| Pakistan | Lesotho | Ecuador | |
| Philippines | Malawi | Guatemala | |
| Thailand | Mozambique | Mexico | |
| Turkey | Namibia | Panama | |
| Vietnam | Nigeria | Peru | |
| Yemen | Seychelles | Venezuela | |
| | South Africa | | |
| | Tanzania | | |
| | Zimbabwe | | |

Also, the number of countries that establish legislation on intellectual property rights in response to the TRIPS Agreement is steadily increasing, as Table 13 shows (based on

GRAIN, 2004, and UPOV⁵⁶). The decisive point with regard to access is whether the systems facilitate expeditious access to PGRFA and whether they allow for breeders' and farmers' exemptions from the rights of the rights holders. Countries differ as to how strict their regulations are. A few seek to combine intellectual property rights with regulation of farmers' rights to local plant varieties.

Table 13: Developing countries with or in the process of adopting TRIPS-related intellectual property rights legislation pertaining to PGRFA as of 2004

| Asia | Africa | Latin America | Pacific region |
|----------------|--------------|---------------------|----------------|
| Bangladesh | Algeria | Belize | |
| Bhutan | Egypt | Bolivia | |
| China | Kenya | Brazil | |
| India | Mauritius | Chile | |
| Iraq | Morocco | Colombia | |
| Jordan | South Africa | Costa Rica | |
| Korea, Rep. of | Tunisia | Ecuador | |
| Oman | Zimbabwe | Mexico | |
| Pakistan | | Nicaragua | |
| Philippines | | Panama | |
| Saudi Arabia | | Paraguay | |
| Sri Lanka | | Peru | |
| Taiwan | | Trinidad and Tobago | |
| Thailand | | Uruguay | |
| Vietnam | | Venezuela | |

The general trend is, however, one of reduced access to PGRFA from various legal angles – a trend which is not conducive to the management of PGRFA as defined in Table 1 and which may seriously hamper the further maintenance of these resources, depending on forms of restrictions and their implementation.

Nevertheless, access to genetic resources is a central intention behind the IU/ITPGRFA as well as the CBD. Even the OECD countries behind the provisions of the TRIPS Agreement on plants and plant varieties – with the United States in the lead – advocate free access to PGRFA which is not protected with intellectual property rights. Thus, the regimes have worked to the contrary of core intentions of their proponents when it comes to access to PGRFA in the period under study – due to regime interaction.

6. Conclusions

This paper has outlined an analytical framework for the analysis of aggregate regime effects. This approach has proven fruitful in pinpointing the challenges regarding to international governance of PGRFA, and is considered to have potentials for analysing the requirements for international governance in other issue areas as well.

A key conclusion presented in this paper is that the international constellations of norms and rules resulting from the overlap and interaction between the regimes in question were largely detrimental to access to PGRFA in developing countries throughout the period studied – despite other intentions behind the individual agreements. The result of these developments is

⁵⁶ UPOV homepage on memberships available at: www.upov.int/en/about/members/pdf/pub423.pdf

an emerging anti-commons tragedy: a situation where multiple actors have the possibilities to exclude each other from access to, and the use of, these vital resources.⁵⁷

A pressing question is subsequently: How can these results help identifying better approaches to the access issue? We have seen that the motivation for the regulation of access to genetic resources was – and still is – control over these resources in order to ensure benefit sharing as a response to intellectual property rights. We have also seen that the current approaches to linking benefit sharing with access to these resources have not yielded any benefits, rather the converse. How, then, might the sharing of benefits from the use of PGRFA be encouraged without contributing further to restricting access to these vital resources?

Basically, there are two points of departure for ensuring benefit sharing: such arrangements can be attached either to (1) access procedures or to (2) the commercialisation of the products, for example when applying for intellectual property rights. The latter approach may involve the disclosure of origin of the PGRFA used, and of documentation as to how benefits will be shared with providers of the resources. This has been suggested by many actors, also in the TRIPS Council. The Philippine case shows that powerful actors obstructed such a development in that country. This is probably not the only country where such forces are at work (more examples in Andersen, 2006a and forthcoming 2007). Subsequently, most attempts towards benefit-sharing arrangements thus far have been attached to procedures for access, leaving the burden of proof with the providers of genetic resources, not the users. The result has been a considerable increase in bureaucracy. Nevertheless, the prospects for benefit sharing based on the use of PGRFA – if the suggested system should materialise – are uncertain. The questions are whether it would reduce bureaucracy and enable facilitated access to PGRFA – and whether there would be enough benefits to share to legitimise the transaction costs. Only if the answers to these questions are ‘yes’, would it be a viable path.

Another solution would be to fully detach benefit sharing from access to PGRFA, which would necessitate a total re-organisation of benefit sharing arrangements. One point of departure could be to revert to the question of who are the users and who are the providers of PGRFA. The users are not only the plant breeders, but also the farmers who use improved varieties, and the consumers who buy the resultant food. The providers are not only the farmers who bred a certain variety that might have been included in an improved variety (usually there are few such direct links), but all those farmers (those living today, and their ancestors) who contributed to maintaining the diversity that brought forward the varieties that came to form the basis for the improved varieties. The implications of these considerations would be that benefit sharing should take place between the users at large – and the farmers still active in maintaining PGRFA for present and future food production on the other hand. That would solve the tragedy of the commons – while at the same time helping to reduce the emerging anti-commons tragedy in PGRFA management. However, practical solutions to this challenge have not yet been found, and political motivation is probably low. As it will take time before the ITPGRA Multilateral System becomes operational and it is uncertain how much benefit it will receive for sharing, development co-operation will probably remain the main source of benefit sharing with farmer custodians of PGRFA in developing countries in foreseeable future.

⁵⁷ The term ‘anti-commons tragedy’, in contrast to Hardin’s classic ‘tragedy of the commons’ (1968), was first coined by Heller and Eisenberg (1998), referring to the situation of biomedical research. It has later been used in the context of PGRFA management by Ramanna (2003), Ramanna and Smale (2004), Brush (2004 and 2005), and Andersen (2006b and forthcoming 2007).

In any case, the most urgent challenge in PGRFA management today is to uphold legal space for farmers to maintain their roles as custodians of agrobiodiversity (Andersen 2006c). Access to, and the customary use of, seeds and propagating material are central aspects in this regard.

The work on which this paper is based includes a comprehensive analysis of driving forces and mechanisms of influence. Due to the page limit of this paper, only a brief presentation could be provided of that part of the analysis (Section 2.5). The driving forces behind regime interaction transform and channel their interests and/or ideas into these developments along various patterns – mechanisms of influence – which can be traced across scales from the international to the national level. Together with the analytical framework presented in this paper, the identification of mechanisms of influence and their patterns of work can provide entry points for actors to shape governance in issue areas such as agrobiodiversity at the international as well as national levels – and to break vicious circles, such as the emerging anti-commons tragedy in PGRFA management.

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