TRANSPARENCY AS CONTESTED POLITICAL TERRAIN:
WHO KNOWS WHAT ABOUT THE GLOBAL GMO TRADE AND WHY DOES IT MATTER?

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ABSTRACT

This article explores the prospects for transparency to be a transformative force in global biosafety governance. The global regime governing trade in genetically modified organisms (GMOs), the Cartagena Protocol on Biosafety, institutionalizes information disclosure as the central mechanism through which to govern safe transboundary transfers of GMOs. This paper analyses the scope and nature of disclosure obligations relating to GMOs in the bulk agricultural commodity trade, and the implications for the normative, procedural and substantive goals to be accomplished through disclosure. Through analyzing "whose right to know what and why" with regard to the global GMO trade, the paper finds that the limited disclosure currently institutionalized in this regime *follows rather than shapes* market developments and that complex infrastructures of sampling, testing, detection and verification have to be deployed by information recipients in an attempt to put disclosed information to use to meet desired ends. As a result, in practice, instead of a normative right to know of potential importing countries, a norm of *caveat emptor* (let the buyer beware) prevails instead in global GMO trade. I conclude that the potential of transparency to empower is yet to be realized in this area, particularly for the poorest countries most reliant on globally-induced disclosure.

INTRODUCTION

In a changing global environmental governance context, the frontiers of governance innovations are ever-shifting. In an evolving and impressive kaleidoscope of innovations, one deserves more sustained scrutiny than it has received to date, given its ubiquitous presence in the domain of global environmental governance. This is the phenomenon of "governance by transparency" or governance by information disclosure.

Transparency is being embraced by a variety of actors as a norm, procedural principle and/or mechanism of global environmental governance. Information disclosure, as one manifestation of this, is central to a growing range of governance initiatives, led by both public and private actors. These range from private voluntary initiatives on sustainability reporting or promotion of sustainable resource use to multilaterally negotiated treaties relying on information disclosure to govern global transfers of risk and harm. While a proliferation of such "governance by disclosure" initiatives can be considered a transparency turn in global environmental governance, diverse normative rationales underpin a growing reliance on transparency, and it is promoted by different actors to serve a variety of different, and often conflicting, ends (Langley 2001, Gupta 2008, Mason 2008, Florini 2008).

If so, it becomes imperative to analyze transparency as a key political arena where ongoing conflicts over norms, practices and objectives of global environmental governance take place, even as it becomes important to consider whether transparency can itself be a transformative force in reshaping such practices and dynamics. Writings on transparency in a global environmental context have ranged from a liberal institutionalist and functionalist view that "more and better information" can aid in effective international environmental cooperation (Mitchell 1998), to more constructivist perspectives that analyze information itself as an arena of political conflict rather than as a means to rationalize such conflicts (Jasanoff 2004). Drawing on this latter perspective, one key question becomes not so much whether transparency can ameliorate information asymmetries in order to promote more rational outcomes, but whether it can promote norms and practices that can reconfigure existing power asymmetries and relationships.

With such a concern as its point of departure, this paper analyzes governance by transparency in the domain of global biosafety politics. Ensuring biosafety, or safe trade in genetically modified organisms (GMOs), remains a controversial global risk governance challenge, one where the very existence of risk and harm remains contested but also one where information disclosure is central to current global governance efforts. The implications of relying on governance by disclosure in such a normatively and scientifically contested global political arena are important to consider.

I focus here on governance by disclosure in the global regime of the Cartagena Protocol on Biosafety, negotiated under the Convention on Biological Diversity. The Cartagena Protocol seeks to govern safe transboundary transfer and use of genetically modified organisms (GMOs). It advances the notion of "advance informed agreement" of an importing country as the central mechanism through which to mitigate potential harm resulting from trade in GMOs. Advance informed agreement derives from the longer established notion of "prior informed consent", used in the international realm to govern trade in risky substances such as hazardous wastes and restricted chemicals. At the heart of prior informed consent lies the disclosure of information, thus global regimes institutionalizing this concept are prime examples of governance by disclosure.

Prior informed consent, as deployed in a global context to govern risky trade, is intended to be a compromise between the two extremes of an outright ban on trade versus reliance on *caveat emptor* or "let the buyer beware", where the onus to know about and avoid harm rests solely with the buyer (Mehri 1988). This compromise is promoted in a global context by a variety of actors, for diverse reasons. Its normative underpinnings can be interpreted in two quite distinct ways: as a way to ensure efficiency in decision-making and thereby facilitate trade; and as a way to ensure freedom from harm by providing the basis for restrictions in trade (see also Wolf 2000).

This reinforces, as stated earlier, that governance by disclosure and its various manifestations in a global context are sites for contestation over norms and objectives of governance. If so, it becomes important to analyse what the scope and nature of disclosure mandated within this regime is, and what (and whose) governance ends it seeks to further. This is the central aim of this analysis.

In addressing this here, it is important to first categorize the various aims that disclosure might be intended to further. These can be divided into normative, procedural and substantive aims. Governance by disclosure seeks, first and foremost, to further a normative right to know of recipients as an end in and of itself; second, it also seeks to further various procedural ends, such as enhanced participation or choice of information recipients, or enhanced accountability of disclosers; and finally, through furthering such normative and procedural goals, disclosure can also further substantive (outcome-oriented) ends such as environmental improvements, sustainable resource use or risk reduction. If so, an assessment of how disclosure is working (its "effectiveness") needs to consider not only substantive outcomes, but also normative and procedural effectiveness.

The aims of 'prior informed consent' – as one key example of governance by disclosure – can also be categorized in a similar manner. Normatively, prior informed consent seeks to further a right to know about transfers of risky substances (for those at the receiving end of such transfers); procedurally, it seeks to further the goal of choice and informed decisions on the part of recipients; and substantively, it seeks to further the goal of domestic risk mitigation relating to such trade. As noted above, however, such goals remain contested. Thus, for those advocating globally for market access and continued trade in GMOs, the goals to be pursued by prior informed consent are quite distinct, and can include enhanced economic efficiency and evidence-based decision-making in order to promote the substantive goals of trade facilitation and market access.

Given such diverging views, analyzing how disclosure is being institutionalized and how it is working within the Cartagena Protocol can reveal whose normative, procedural and substantive aims are furthered, and the implications for the oft-alleged potential of transparency to empower in such contested global environmental governance contexts. A focus on the Cartagena Protocol is also timely, with the five years since the Protocol came into force in 2003 representing a still-evolving process of institutionalizing transparency as the central norm and practice through which to govern global GMO transfers. In particular, transparency is the arena where conflicts over how to regulate the bulk agricultural commodity trade with GMO varieties (which constitutes the vast majority of GMOs transferred globally) are aired and negotiated. I focus, therefore, on

this key dimension of global GMO governance here.

The analysis reveals that, contrary to a goal of facilitating informed choice of importing countries, a norm of *caveat emptor* (let the buyer beware) prevails in the global GMO trade. The protocol's current disclosure obligations do not require detailed, specific and new information regarding GMO varieties in the bulk commodity trade to be disclosed, and hence fail to operationalize a normative right to know about transfers of risk, as demanded by recipients. The limited nature of disclosure obligations also ensure that disclosers' (i.e. GMO producers') existing practices do not have to change. As a result, I argue, disclosure here is *market following rather than market forcing*.

Furthermore, in order for recipients to put (limited) disclosed information to use, the onus rests on them to put into place complex infrastructures of sampling, testing and verification of disclosed information. Such "infrastructures of transparency", I argue, are increasingly central to governance by disclosure, giving rise to new forms and loci of authority. Whether such new forms of authority ameliorate or exacerbate informational and power asymmetries, and whose normative and substantive goals they (will) further, is a rich area for further conceptual and empirical inquiry.

Meanwhile, those unable to "make transparency work" for them via such infrastructures of testing and verification have to contend either with *caveat emptor* or resort to alternative regulatory tools such as bans or moratoria in order to meet their substantive goals of risk reduction. As a result, I argue, the potential of transparency to empower is yet to be realized, particularly for the poorest developing countries most reliant on globally-induced disclosure. In this dynamic, uncertain and anticipatory area of governance, however, such a conclusion may be outdated almost before it is reached, and transparency's subtle powers and insidious ways of working may yet reveal themselves. The transformatory potential of transparency lies, perhaps, in this eventuality.

These arguments are elaborated in the remainder of the paper in the following steps: Section 1 details the dynamics of negotiating disclosure requirements for the global GMO commodity trade in the last five years since the Cartagena Protocol came into force, and the current scope of disclosure obligations. Section 2 analyses the consequences of the protocol's current disclosure obligations and practices for the

normative, procedural and substantive aims that transparency is intended to achieve. The analysis is based upon participant observation of the Cartagena Protocol negotiations until 2004, as well as a range of primary and secondary sources now becoming available.

1. NEGOTIATING THE BOUNDARIES OF DISCLOSURE: ACTORS AND SCOPE

In this global regime, disclosure relating to GMOs traded for use as food, feed or for processing (agricultural commodities) remains one of the central axes of conflict. Agricultural commodities account for the vast majority of globally traded GMOs and the economic stakes are highest here, because the scope of disclosure has implications for the multibillion dollar global agricultural commodity trade. Of the most heavily traded global agricultural commodity crops, four have a growing number of GMO varieties. These are soybean, maize, canola and cotton (James 2008). Genetically modified cotton (and its associated trade) is relatively uncontroversial, because it is not a food or feed crop (except where cottonseed is used for animal feed but this is often for domestic use). Maize, soybean and canola, however, are used for animal feed, food as well as in a vast array of processed foods. Various other food and basic grains are in different stages of commercialization, testing and development, including other key global grain and cereal crops such as wheat and rice (James 2008).

Although agricultural commodities are imported by a large number of countries, their export, and in particular export of GM varieties of such commodities, is limited to a few countries. The countries that constitute the bulk of such production and export include the United States (with roughly 50% of all GM production and trade), Canada, Australia, Argentina, Brazil and China (these latter three countries account for almost 90% of all GM crops grown in developing countries) (Zepeda 2006). Key importers of bulk agricultural commodities include the European Union, Japan, Mexico, China, South Africa, and many other countries in the South.

In early stages of protocol negotiation, developing countries demanded the application of the Protocol's most stringent 'advance informed agreement'[1] regulatory

[1] The shift in the protocol's language from 'prior informed consent' (PIC) to 'advance informed

requirement for this category of traded GMOs[2]. Their goal was to *shift the burden of responsibility* to exporting countries to provide detailed information and solicit explicit consent of an importing country prior to such bulk commodity trade occurring. The European Union, as an important market for bulk agricultural commodities, and with increasingly stringent regulations for GMO use in food and feed, demanded that documentation *accompanying* bulk commodity shipments with GMOs clearly state that they "contain GMOs", including the identity and unique characteristics of each GMO variety contained in a given shipment.

These demands were rejected by the main GMO producing/exporting countries (organized into a negotiating coalition called the Miami Group, consisting of the United States, Argentina, Australia, Canada, Chile and Uruguay) because it would have required segregation of GMO varieties through the agricultural commodity chain, something not (yet) not in place in most exporting countries, and seen as expensive and disruptive to the bulk agricultural commodity trade (Bail et al. 2000, Gupta 2000, Falkner 2000).

The compromise reached in 2000, when the Cartagena Protocol was concluded, was to exclude commodities from advance informed agreement. Instead, disclosure in two-stages and via two means is to apply to this category of GMOs transferred globally. As a first step, as soon as a commercial variety of a GM crop has received domestic approval in a country of production, this has to be reported to an online Biosafety Clearing House within 15 days of the approval being granted, together with a summary risk assessment upon which approval was based. The aim is to alert potential importing countries of such an approval, in advance of a given GMO variety entering international

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agreement' relates to the opposition from the United States to use of PIC for the GMO trade, given its association in a global regulatory context with trade in hazardous waste and chemicals. The alternative term 'advance informed agreement' was introduced by the US as a way forward in this contested area of risk governance. For analyses of this language shift, see Rajan 1997, Wolf 2000 and [author].

[2] Advance informed agreement now applies only to GMOs traded for introduction into an importing country's environment (eg. for planting as seed). Less stringent obligations apply to all other categories of traded GMOs, such as those for food or feed; and for contained use in laboratories (CP 2000, see also Bail et al. 2000 and [author] for analysis of early negotiations around these categories).

trade. Although this is far from *informing each individual country* in advance of a GMO transfer and soliciting its consent, it does require advance disclosure (to a global online system) about which GMO varieties are being approved in producer countries. The onus remains on individual importing countries to keep themselves abreast of such developments, in contrast to advance informed agreement where this burden is reversed. Furthermore, such an obligation does not reveal when or if a particular GMO variety will be shipped to any given country as part of the bulk agricultural commodity trade.

In addition to this online advance disclosure requirement, a crucial second component of disclosure, and one that has been at the center of disputes, is the information that should *accompany* agricultural commodity shipments, once they are underway. It is this aspect of disclosure that is the focus of the present analysis. The 2000 compromise agreement requires bulk shipments of agricultural commodities which may contain GMO varieties to disclose that they "may contain" GMOs (rather than that they "contain" GMOs, and specifying which ones). Exporting countries refused to go beyond this, resulting in a near-collapse of the negotiations. Their only concession to importing countries at this stage was to agree to revisit these obligations within a fixed time frame (two years after entry into force of the protocol) (CP 2000, Art. 18; Bail et al. 2002).

As recent negotiations on this contested issue have revealed, disclosure about the bulk agricultural commodity trade is a key arena where conflicts between shifting and evolving coalitions of GMO exporting and importing countries continues to play out. This reflects one key dynamic in this global governance arena: that the axis of conflict is no longer along traditional North/South lines[3]. Instead, the main dynamic is between GMO exporting and importing countries, and each of these categories includes both developed and developing countries. Two global economic powerhouses fall on either side of this main axis of conflict, with the European Union (often allied with Japan and a majority of developing countries, particularly in Africa) consistently articulating the

[3] As they were, for the most part, in the early discussions around a protocol in the 1990s, with the key axis of conflict being between developing countries versus developed countries producing GMOs, with the EU maintaining its distance, seeing a global biosafety protocol as not particularly relevant for it. This has changed dramatically in recent years, as a transatlantic divide over GMO governance has solidified.

GMO importer perspective, and the US and allies such as Canada, Australia and Argentina, consistently articulating the GMO exporter perspective. Unlike in other cases of governance by disclosure, where the "powerful" might have to disclose to the "less powerful", here a transatlantic divide of power shapes norms and practices of disclosure.

Added to this are the evolving positions of some large developing and OECD countries, such as Brazil, China, South Africa, New Zealand and Mexico, which are either both exporting and importing countries (China, South Africa), or are concerned about their non-GMO agricultural exports (New Zealand)[4] or about their trade relationships with key GMO exporters (Mexico)[5]. Some large developing countries have *both* exporter and importer interests, highlighting that such categories are not static or mutually exclusive. It is in the realm of shifting global agricultural trade relationships between these key players that the norms and practices of disclosure are hashed out.

A second important dynamic shaping disclosure norms and practices is the Party/non-Party (to the Protocol) status of these key players, given that most exporting countries (such as the United States, Canada, Argentina and Australia) are *not* currently Parties to the protocol, while most of those articulating importer perspectives (including the European Union and most developing countries) *are* Parties. Furthermore, those with competing and shifting interests (whether exporter or importer) such as Brazil, Mexico, New Zealand, China and South Africa, are Parties as well. These two dynamics, i.e. the shifting coalitions of exporting and importing countries which cut across North/South lines, as well as Party/non-Party status of the key players, have been the two crucial factors shaping the scope and practice of disclosure in this regime.

Following intense negotiations amongst these key players, agreement to somewhat strengthen the disclosure requirements was reached in 2006 at the third session

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[4] New Zealand's concern is impact on non-GMO agricultural exports if stringent disclosure requirements are adopted for GMO trade, since adventitious (unintended, technically avoidable) presence of GMOs in non-GMO shipments might require these shipments to be labeled as well (Winston 2006).

[5] Mexico, as a GMO importer country, has been a key interlocutor for its NAFTA (and GMO exporting country) trading partners, the United States and Canada, in this global context, given that both are not Parties to the Protocol and hence cannot formally participate in the negotiations.

of the meeting of the parties to the protocol, hosted by Brazil[6]. The new disclosure requirements state that those agricultural commodity shipments that contain *identity preserved GMOs* are to be labeled as "contain" GMOs. All others, for whom identity preservation systems are not currently in place, will continue to be labeled "may contain" GMOs (CBD 2006) [7]. Further discussion about whether to impose a "contain" GMO obligation on all shipments is now postponed to 2012. Furthermore, until such time, exporting countries can use an existing commercial invoice in order to disclose information, as pushed for by these countries, rather than a "stand-alone" document, desired by potential importers, which would draw special attention to the possible presence of GMOs in a given shipment (CBD 2006, paragraphs 1 and 4).

There is an additional requirement to disclose, for those shipments still labeled "may contain", a list of which GMO varieties *might be* in a shipment, including their scientific, common and/or commercial names, as well as unique identifier code[8], where known. Finally, the decision also states, following extensive and heated negotiations, that "the expression "may contain" does not require listing of living modified organisms of species other than those that constitute the shipment" (CBD 2006, paragraph 6)[9]. This component of the decision is widely interpreted to have important implications for thorny

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[6] Brazil wears three hats simultaneously in these negotiations; those of *developing country, Party to the Protocol, and exporter interests*. This requires a balancing act to support *and* temper other developing countries´ demands for stringent disclosure relating to GMOs in trade, while ensuring that it will be in a position to both comply with disclosure obligations on exporters *and* not be at a competitive disadvantage vis-à-vis other agricultural exporting (non-Parties) who are not legally obliged to comply.

[7] It is further specified that these disclosure obligations apply to those GMO varieties that are "in commercial production and authorized in accordance with domestic regulatory frameworks" with disclosure to be "in compliance with the requirements of the country of import" (CBD 2006, para. 4).

[8] A unique identifier is a numeric code associated with each genetic transformation event, developed by the OECD and promoted in this global context by the EU as a way to standardize the identification of GMO events and facilitate tracking and testing for their presence in commodity shipments.

[9] That is, a maize shipment does not require potential GM varieties of soybean that may be co-mingled and inadvertently present, to be listed.

discussions relating to adventitious presence of GMOs in trade[10].

I consider next the implications of these disclosure obligations from both exporting and importing country perspectives, and what normative, procedural and substantive goals (and whose goals) such disclosure obligations are likely to further.

2. TRANSPARENCY AS CONTESTED TERRAIN: WHOSE RIGHT TO KNOW WHAT AND WHY?

This section analyzes to whom it matters (and why) that shipments of bulk agricultural commodities will state that they "may contain" GMOs, and other agreed aspects of disclosure relating to such trade. Section 2.1 considers the extent to which a GMO importing country's normatively grounded aim to be informed about potentially risky transfers is institutionalized by these disclosure requirements, and whether information disclosers' (exporting country) practices have to change. Section 2.2 then considers the institutional infrastructures of testing and verification that need to accompany such (limited) disclosure before it can contribute to meeting importing country procedural goals of informed decision-making and oversight over the GMO trade. Finally, section 2.3 revisits the question of *disclosure for whom* and for what purpose, through examining the implications of these disclosure obligations for *different categories* of importing countries, depending upon domestic GMO governance goals.

2.1. Transparency as right to know: disclosing sufficient new information?

Disclosure stating that bulk agricultural commodity shipments "may contain" GMO varieties, together with other information noted above, such as a list of which ones *may* be in a shipment, and common and scientific names etc., certainly goes beyond no such information being provided at all (the status quo in the absence of the Protocol). What, however, are the implications of such disclosure for both an importing country's desire to know about transfers of GMOs, and an exporting country's desire to minimize market restrictive effects of disclosure? In assessing this, two points can be made. First,

[10] Adventitious presence is the unintended (and, more importantly, unavoidable) presence of trace quantities of other GMO varieties from the ones known to be / intended to be present in a given shipment.

the information required to be disclosed currently is vague and insufficiently detailed; and second, no new information has to be generated to fulfill disclosure obligations. I elaborate further on each of these points and their implications below.

First, an obligation to disclose that particular shipments "may contain" GMOs is, as it sounds, vague and imprecise. Essentially, it requires that any bulk shipment of, for example, soybean state that it "may contain" any of the genetically modified varieties of soybeans that have been approved domestically and are in commercial production in a given exporting country. It does not require disclosure of which specific varieties or in what quantities. Such detail and specificity would require segregation[11] as well as elaborate testing to determine, with the onus for this resting on the exporting country – an outcome that importing countries have continually pushed for but as yet failed to achieve.

Thus, it can be argued that the "may contain" requirement simultaneously reveals too much and too little information. On the one hand, it permits a scenario whereby a long laundry list of potential GMO varieties that *could be* in a shipment is provided. This highlights one of the key challenges of relying on transparency as a tool of governance – that it can be subverted in practice via the phenomenon of 'drowning in disclosure' or provision of too much information, where the relevant might be buried in the irrelevant and hard to find. On the other hand, even as a long list of potential GMO varieties are disclosed, no information is revealed about which varieties, and in what quantities, are actually present in a shipment. In that sense, too little information is provided.

Second, a "may contain" disclosure obligation reveals information that already exists and is known to exporters. Essentially, any bulk shipment of an agricultural commodity with GM crop varieties simply requires such a declaration if shipped from an exporting country with no segregation between GM and non-GM varieties in place, which holds for the vast majority of exporting countries. No new information needs to be generated in order to comply with such disclosure. This goes to another key issue in assessing effects of disclosure: whether new information is required to be generated in order to fulfill disclosure obligations, increasing the likelihood that disclosure may have

[11] Segregation is the separation of GM from non-GM varieties along the commodity chain.

behavior altering consequences. This is reinforced by the caveat in the Protocol's 2006 decision that in the obligation to list which GMOs *may* be present in a shipment, only GMOs of the same species as the commodity being traded need to be listed. Here the burden of generating new information, which would otherwise rest on exporters, is again avoided, i.e. the burden of testing for and disclosing possible adventitious presence of GMOs from other species (information that is not presently known to exporters).

In sum, a disclosure requirement that bulk shipments of commodities have to state that they "may contain" GMOs is vague and reveals what is already known to the disclosers. Furthermore, it does not shift the burden of responsibility to test for actual presence of GMO varieties in particular shipments to exporting countries, a key goal pursued by importing countries through governance by disclosure. Finally, the means of disclosure agreed here, an existing commercial invoice rather than stand-alone document, is also the least burdensome for exporters, entailing little change in existing practices and being the least market restricting means of complying with disclosure requirements.

A key conclusion to be drawn from the above discussion, then, is that *no established practices have to change* in order for exporting countries to meet the protocol's disclosure obligations relating to the bulk agricultural commodity trade. According to industry analyses, disclosing more specific detailed information, such as a list of which GMO varieties are actually present in any given shipment (let alone in what quantities) would be impossible to realize at the present time, given how the bulk agricultural trade is currently organized. For such disclosure, established practices would have to change, requiring mandatory segregation of GM from non-GM varieties and elaborate testing at various points in the commodity chain, with the onus to do so resting on exporting countries. In most exporting countries, however, instead of segregation, co-mingling is still a mainstay of the business, whereby grain from a wide variety of sources is mixed at different points, constantly changing the ratio of genetically modified to non-modified varieties in any given shipment entering global trade (USDA 2008).

Most importing countries continue to maintain that a 'may contain' declaration does not reveal comprehensive, relevant and usable information that they desire, such as which specific GMOs varieties are in a particular shipment and in what quantities. This

more specific information, it is argued, is essential not only to be sufficiently informed about potentially risky GMOs entering their borders, but is also in order to meet concrete procedural and substantive domestic regulatory aims such as consumer choice, labeling, traceability and food safety, which might require such detail and specificity[12]. In sum, a "may contain" obligation does not reveal much of use to importers, and is not onerous for exporters nor does it shift the burden of testing or generating new information onto them.

What, however, are the implications of the additional disclosure obligation agreed in 2006 to state, for those *genetically modified organisms for which identity preserved varieties exist*, that they "contain" GMOs? At first glance, this would appear to be a significant advance over the "may contain" obligation. A quick assessment of the implications reveals, however, that identity preservation is a concept and a practice that is more commonly associated with *non-genetically modified varieties* of those crops where genetically modified varieties exist. The idea of identity preservation is to ensure that a high-value crop (usually non-GM, more rarely GM) is not contaminated with other GM or non-GM varieties (Elbehri 2007; Ceres undated; Sahai undated). The practice thus far is that identity preserving a non-GMO variety of a heavily traded crop which has GM varieties (such as soybean, for example) makes economic sense for countries that are large exporters of this commodity *and* wish to supply markets that desire non-GM soybean, either for use in organic agriculture or as a result of other domestic imperatives. Brazil is a classic example, whereby identity preservation would be undertaken in order to supply guaranteed non-GM soya varieties for the EU or the Japanese market.

The protocol disclosure requirement, however, states that the "contain" obligation is to apply to *identity preserved GMO varieties*. There are, however, few of these too date, particularly in the first generation of GM varieties, and particularly in countries such as the US, where GM and non-GM varieties are considered substantially equivalent, logically suggesting no reason to identity preserve. Only those GM varieties that have special nutritionally altered characteristics (such as vitamin A enhanced "golden rice" – not yet commercialized or traded) or other product characteristics (such as altered oil

[12] Whether this holds for different categories of importing countries is discussed in section 2.3.

content or quality, for example, high oleic soybean) would, from a market perspective, be worthwhile or necessary to identity preserve (Elbehri 2007, 2).

In sum, it would appear that GM varieties of the main agricultural commodities currently traded globally that are identity preserved are a very small component, and where they do exist, such shipments are already marked as containing the GMO variety in question. Moreover, their production is often undertaken under specific contract between producers and end users. With regard to who bears the burden of testing and segregation for identity preserved crops, here the burden is indeed born by exporters, yet such a burden is already being shouldered (willingly) for market access reasons, given higher price premiums that such crops command. If so, this component of disclosure is also market following (as is the "may contain" obligation), rather than market forcing.

As a final point, it can be noted that the protocol's obligations do not specify *who* decides whether an identity preservation system exists for a GM variety or not, and thus whether the "contains" disclosure requirement is triggered. If so, the *de facto* assumption is that this decision (and this knowledge) rests with the exporter. Thus, it is safe to say that the dominant disclosure obligation for the vast majority of traded GMOs remains that they "may contain" GMOs, with all its attendant implications explored above.

Notwithstanding their limited nature, are these disclosure obligations being complied with by exporting countries? As noted earlier, most GMO exporting countries are not Parties to the Protocol. Hence, the first point to note is that they are under no legal obligation to comply, even as they are permitted to trade with Parties as long as such trade in is "keeping with the Protocol's objectives" (CP 2000, Article 24). If so, the only way to ensure that an exporting country non-Party complies with protocol disclosure obligations is if two conditions are simultaneously met: if trade is with a country that *is* a Party to the Protocol *and* if the Protocol's disclosure requirements are first translated into the domestic law of that importing country. Thus, having domestic laws in importing countries that reflect (or go beyond) the protocol's disclosure obligations is the only way to ensure that exporting countries currently outside the global regime comply with its disclosure obligations. Section 2.3 below considers further the implications of varying stringency of domestic regulations for eliciting disclosure from exporting countries.

In the absence of detailed national reporting about how countries are implementing the protocol, and lack of any such reports by exporting country non-Parties (except Australia) (CPB 2008a), it is difficult to ascertain whether agricultural commodity shipments *actually* state that they "may contain"' or "contain" GMOs, i.e. to ascertain compliance with these disclosure obligations. This is partly because what any given exporting country has to reveal with regard to any given shipment will vary widely, depending upon what different importing country domestic regulations call for. Given its non-onerous nature, one can largely assume that most non-Parties are complying with the protocol's minimum disclosure requirement to state that shipments "may contain" GMOs. The point here is that, even if being complied with, such disclosure reveals little that is currently useful to recipients and with few material consequences for disclosers.

This argument applies also to the requirement that information about GMO varieties approved domestically in exporting countries has to be disclosed, in advance, to the Biosafety Clearing House (see Section 2.1). Discussion of this aspect of disclosure is precluded here[13] except to briefly note that relatively little information of direct relevance for importing countries is currently available on the BCH. As I have argued elsewhere, the information provided so far to the BCH (largely by parties to the Protocol about their domestic GMO laws and contact persons for biosafety decisions) is, in fact, more likely to help facilitate exporting country goals of efficiency and speed in decision-making and market access, than importing country goals of informed consent (see [author]).

The discussion above suggests that disclosure in the Cartagena protocol does not (yet) place the burden on exporters to sufficiently inform importers about GMO presence in the global commodity trade. If so, *caveat emptor* (let the buyer beware) largely prevails, with market developments shaping how fast and how far disclosure goes with regard to such trade, rather than disclosure obligations pushing market developments.

Meanwhile, with the onus of responsibility remaining on importing countries to ferret out detailed and specific information about traded GMOs, the focus in this disclosure regime is now shifting to elaborate sampling, detection, testing and

[13] For a detailed analysis of how BCH disclosure is working, see [author].

verification systems by which to monitor incoming shipments of bulk agricultural commodities. I turn to the implications of this development next.

2.2. Making transparency work: sampling, detection, verification, liability

Given the current status of disclosure obligations in this global regime, essentially revolving around a 'may contain' obligation, the practices of governance by disclosure have now decisively shifted to setting up and operating infrastructures of sampling, testing, detection and verification of GMOs in the bulk commodity trade. Such "infrastructures of transparency" appear necessary, first, in order to augment the limited information currently disclosed and generate greater specificity; and second, to test for and verify the accuracy of disclosed information (and such an imperative exists no matter how much information is disclosed – thus it will not lessen with provision of more information). For these two reasons, systems and practices of sampling, testing, and verification are becoming fixtures in governance by disclosure in this global domain[14].

As a synthesis of country experiences relating to this aspect of biosafety governance makes clear, in recent years an entire infrastructure of sampling, testing, and verification for GMO transfers is indeed emerging globally (CBD 2008b). The issues this raises are multifold, ranging from the costs associated with these systems and practices, to who should bear these costs, to which detection methods are adequate, to how to address sampling errors, and where the onus rests for liability relating to these matters. Underlying this is the question whether sampling, testing and verification of GMO information is the desired pathway to "effective" global biosafety governance for all.

Within each of the components of such infrastructures of transparency (sampling, testing, detection), complex, contested and uncertain issues arise. In particular, *detection* of GM content in food, feed and in processed products looks set to become a key site where battles of knowing and disclosing (and biosafety governance in general) are likely to be fought in the future – notwithstanding the image it evokes of a technically complex and esoteric activity conducted by neutral scientists toiling in obscure scientific

[14] Importantly, this need for infrastructures of testing now extends to producers of non-GM foods as well, including for organic agriculture to prevent contamination with GM crops (Ceres undated).

laboratories. Its politically contested nature is evident from an emerging transatlantic divide in this domain: two key detection methods dominate current GM testing, with one favored by the US and the other by the EU. The US preferred method, protein testing, is relatively easy, cheap and quick but imprecise; the EU preferred method, DNA testing, is technically complex, expensive and time-consuming but yields more precise results (Holst-Jensen undated; CBD 2008b: 11). Which of these is endorsed as an appropriate (or adequate enough) method of detection, given varying costs and consequences for exporters and importers in the agricultural commodity trade, is a key political issue.

Further complicating matters is the question of what "truths" are revealed by such sampling, testing and detection, i.e. the reliability of the information obtained via testing. Kalaitzandonakes, in discussing the potential costs and technical challenges associated with GMO testing notes that, since GMO testing is:

> "a statistical process, repeated sampling and testing of the very same cargo [can] regularly produce different results. There are several sources of variance in test results, including differences in testing and sampling methods as well as testing error. Testing methods can vary appreciably across labs… conflicting test results could occur even if identical lab testing protocols are used, unless the same sample is tested. Depending on the concentration and distribution of a particular LMO in a particular lot and how it was sampled, it could be difficult, if not impossible, to duplicate any set of test results. Finally, some assay [sampling] error (e.g. false positive or false negative test results) will always exist (2006:24).

With variations in test results and the specter of false positives and false negatives hanging over such results, there can be significant economic consequences for all involved with a testing and verification regime, depending upon how liability for error is distributed. If so, whose testing regimen is "sound" and whose knowledge is reliable are key sites of conflict, which science alone cannot resolve.

Debates within the protocol have thus also focused on the need for *standardization* of various elements of such infrastructures of transparency, such as standardized sampling techniques, detection methods, and testing protocols (CBD 2008b). This also appears to be a looming battleground in governance by disclosure in this area. This is evident from the fact that the objectives to be pursued by standardization vary greatly. For GMO exporters, the goal is to avoid proliferating and diverse national

standards, and to develop minimum agreed standards, so as to reduce potential liability claims or economic harm resulting either from diverging national practices or varying (unstandardized) test results. For GMO importers, such as the EU with its stringent domestic labeling, thresholds and traceability requirements, the goal is global standards that reflect its preferred methods and approaches. An effort in the global food safety standard setting body, the Codex Alimentarius Commission, to achieve agreement on standardized testing and thresholds for GM food have been stalled for a while (Greure 2006), with similar debates now emerging in the context of the protocol as well.

If these systems are complex, expensive, prone to error and a challenge to institutionalize on a global scale for the GM varieties currently traded, what are the consequences of ever more GM varieties entering the market (with, furthermore, each one containing not one or two genetic modification "events" but rather multiple "stacked events" each of which may have to be tested for)? So far, the norm is two or three stacked events in a given GMO variety, and these pose substantial challenges for testing and detection (CBD 2008b). According to James (2008), however, we have seen only the tip of the iceberg with regard to stacked events. As a passionate defender of GM crops, and a diligent chronicler of the enormous "progress" GM crops have made in the last decade, James (2008: 8) notes in bold type in his latest report that:

> "Smartstax™ is expected to be released in the USA in 2010 with eight different genes coding for several pest resistant and herbicide tolerant traits. Future stacked crop products will comprise both agronomic input traits for pest resistance, tolerance to herbicids and drought plus [a variety of] output traits…"

If this is what the infrastructures of transparency will have to contend with, we can envision science-fiction like scenarios (or a Big Brother like scenarios) of testing, detection and verification systems struggling to contend with this, with the enormity of the task daunting in all respects (political, technical and economic). If so, a key question that arises is whether governance by disclosure (and its associated "testing, segregation, identity preservation and coexistence" approach to global biosafety governance) is even a suitable one in this issue area, a question to which I return in the concluding sections.

The above discussion points also to another crucial aspect related to these infrastructures of transparency: how these new and emerging loci of authority will

function and who they will empower. Clearly, detection techniques can be a powerful tool for civil society and others seeking information as well, as evident from recent *starlink* and other controversies surrounding release of illegal GMO varieties and their transfer internationally. In these cases, it was not established state-run systems of oversight that detected unauthorized GMOs in bulk shipments, but rather civil society efforts (Clapp 2007). A key implication of this is that availability of simple detection techniques, developed to support the practice of governance by disclosure, and perhaps widely disseminated via the protocol (through capacity building etc.), may well force further disclosure and voluntarily change market practices, given the possibility that easily detected illegal presence of GMOs may fuel liability claims and lost market access.

On the other hand, to detect presence of illegal and unapproved GMOs, information about *what to test for* is still necessary. Certain types of disclosure are thus required for a testing infrastructure itself to function. This includes reference materials and testing protocols for each GMO variety, information that testers need in order to know what to test for. Such information, however, is often seen as proprietary and not widely available (CBD 2008b). More generally, as the CBD synthesis report points out, "detection of unauthorized or unknown GMOs [is often not possible] due to lack of molecular knowledge of their genetic contents" (CBD 2008b: 15). This highlights that the empowerment potential of these infrastructures of transparency remains up for grabs.

The discussion above highlights, as well, the important links between disclosure, the burden of testing and future liability regimes. Liability discussions have been some of the most contentious in these negotiations (CBD 2009, Bled 2009), not only because of concerns over ecological or health-related damages resulting from GMO use, but also because liability rules fundamentally change the dynamics and incentives structures relating to scope and nature of information disclosure, as well as testing and verification.

For example, once liability regimes are in place, less precise tests might no longer be an option, given the risk of being held liable for inaccurate information. But on whom the onus for greater accuracy will rest remains unclear. It might either shift the burden for testing onto exporting parties (the intent of those pushing for stringent liability in this context), or rather leave it on those who *currently* need to comply with protocol

obligations, and ensure accuracy of their own stringent GMO labeling laws (mainly importing countries who are parties to the protocol). The intricate links between disclosure and systems of oversight and liability are now increasingly coming to the fore.

Much more can be said about sampling, detection and verification practices, which have gained prominence in global biosafety discussions in the last two years or so. As is clear from the brief discussion above, such infrastructures of transparency are still in their infancy, with sampling unreliable and variable, and battles shaping up over suitable testing and detection methods, and their standardization, all of which have also served to turn protocol attention and resources to establishment, functioning (and conflicts over) such infrastructures of transparency. Yet to what end? Whose ends are served (or not served) by these trends is addressed further in section 2.3 below.

From the above discussion, two observations can be made. First, the growing need for sampling, testing and verification infrastructures represents, in this domain as in many others, a potential "technicalizing" of political conflict and creation of new epistemic authorities, where particular forms of expertise are privileged over others (Jasanoff 1987, Gupta 2004). These new loci of authority have the potential to reshape existing power relationships, yet in what ways and how remains unclear. This is related, fundamentally, to who has the capacity and need to establish such infrastructures, as well as the power to shape associated practices and "rituals of verification" (Power 1997a).

As Power notes, a key struggle is over competing claims to expertise. This is especially the case, he suggests, where:

> "…the nature of the market and the competences to operate in it are ill-defined and immature. In such circumstances, even the driest and most procedural elaboration … is not simply neutrally descriptive, it is part of a wider normative discourse which constructs and presents the field in ways which make it receptive to the claims of certain forms of expertise rather than another" (1997b: 124)

This applies to the newly emerging "market" for GMO sampling, detection, testing, and verification infrastructures and practices as well. The relevance and functioning of governance by disclosure in this global realm is likely to be fundamentally shaped by these infrastructures of testing and verification and their architects, suggesting a new locus of conflict and power in this governance by disclosure regime.

Second, the discussion above suggests that this entire direction in global biosafety governance (and governance by disclosure) has greater relevance for some than it does for others. Clearly, constructing such infrastructures of transparency is more feasible for countries of the European Union, or Japan, New Zealand, Mexico and South Africa, where extensive efforts are underway (CBD 2008b; Mayet undated). It poses a far greater challenge for many developing countries, particularly in Africa. These countries thus continue to push for expanding the scope of disclosed information in order to shift the onus of responsibility for monitoring and testing onto exporting countries (ENB 2008).

In the absence of this, and given the increasing focus in this regime on GMO sampling, testing, and detection, and the legal complexity of ongoing liability discussions, a clarion call for greater capacity building is heard from all concerned. While it may be essential, the capacity to develop institutions and practices of sampling, testing and verification (and whose capacity will be built) cannot, however, be separated from political struggles over *whose* institutions and practices are considered reliable, accurate and trustworthy, a dynamic that needs further empirical investigation.

I turn next to how current disclosure scope and practices have differing relevance for importing countries, depending on domestic GMO governance goals and capacities.

2.3. Transparency for whom and why?

In this section, drawing on the analysis above, I return to a central aspect of governance by disclosure: *transparency for whom and to what end*. In particular, I consider who, among the key category of importing countries, most *needs* protocol-induced disclosure to meet domestic GMO governance aims. Within the category of `importing´ countries, there are wide variations in existence and stringency of domestic GMO laws. These distinctions influence the (differing) potential of the protocol's disclosure requirements to meet varied normative, procedural and substantive ends.

In particular, key differences lie in whether domestic GMO regulatory frameworks exist or not; and where they do exist, what they call for. These can require only biosafety risk assessments, or also labeling of food, feed and processed foods with GMO ingredients, with or without threshold levels (and with varying threshold levels).

Finally, some laws may call for traceability of GM varieties from farm to fork[15].

Those countries with the most stringent domestic regulations in place, such as the European Union, clearly require detailed information disclosure as well as guaranteed traceability from exporting countries in order to implement their domestic regulations. Yet these countries are precisely the ones who least need such disclosure to be globally-induced via the protocol, since exporting countries have to automatically comply with such importing country regulations. This holds for all countries with domestic laws that require labeling of GM food or food containing GM ingredients, which includes countries like Brazil, China, New Zealand, Mexico and Japan (see Gruere 2006; Zepeda 2006).

It is countries with no domestic regulatory frameworks, mostly developing countries in Africa or elsewhere, or those where such frameworks are only now being developed, that globally-induced disclosure through the protocol (and its scope) is of greatest relevance. This is because it is the only available avenue through which to impose disclosure on exporting countries. For *these* countries, the main goal is one of a right to know (as much as feasible), rather than to implement stringent labeling or traceability, particularly given the low prospects for achieving domestic segregation and co-existence of GM and non-GM agricultural systems (on this point, Sahai undated).

For these countries, then, the central consideration remains whether protocol-induced disclosure, and its nature and extent, can shift the burden to exporting countries to sufficiently inform importing countries of any impending GMO transfer, and the goal from the outset has been to engineer such a shift. As explored earlier, a "may contain" disclosure requirement does not accomplish this. Furthermore, the current directions of governance by disclosure in this global regime have shifted to developing complex systems of sampling, testing, and verification to put disclosed information to use. With this latter development posing huge challenges for the poorest developing countries, and in the absence of more specific and stringent disclosure forthcoming via the protocol, one path that many such countries have adopted is to impose bans or moratoria on entry of

[15] For detailed discussion of different domestic GMO laws in various countries, including in the South, see Gruere 2006 and Zepeda 2006.

GMOs – as a simpler and quicker option than developing domestic biosafety laws, and an easy way to shift the burden to exporters to comply with such a ban, while removing the need to set up elaborate infrastructures of testing and verification to know about presence of specific GMOs in particular shipments. Countries that have put into place a ban or moratorium on various activities relating to GMOs, (including import in the form of food aid or unprocessed grain) include Algeria, Angola, Lesotho, Malawi, Mozambique, Namibia, Nigeria, Sudan, Swaziland, Zambia and Zimbabwe (Zapeda 2006: 1206). It is also striking (yet supports the argument in this paper) that many bans / moratoria have been instituted in recent years, notwithstanding the Cartagena protocol and its governance by disclosure rules coming into effect.

Another compelling imperative to institute such bans is that for many poorest developing countries, GMO governance and oversight is not (only) for purposes of labeling, consumer choice or food safety, but also related to the essential need for continued access to EU and other markets for non-GMO traditional agricultural exports (which are threatened by the prospects of co-mingling of GM with non-GM varieties). Since, as industry advocates for GM crops consistently argue, co-mingling is such a technical and political reality in the current marketplace, and segregation so costly, it is difficult to argue, as well, that segregation will be a feasible option for poorer countries.

What the above discussion makes clear is that disclosure (its scope and practices) have differing relevance for different importing countries, and thus that "transparency for whom" is a central issue in assessing governance by disclosure. The analysis suggests that globally-induced (comprehensive) disclosure is most needed by those with the least capacity to develop domestic regulations and inform themselves via that route. For these countries, a key imperative is to globalize "a right to be told" rather than simply a "right to know" (because with the latter alone, the burden of testing and verification may not be shifted to those disclosing information).

3. CONCLUSION: TRANSPARENCY'S TRANSFORMATIVE POTENTIAL?

What does this analysis reveal about transparency's transformative potential and prospects to meet a variety of normative, procedural and substantive ends? As I have

argued above, the Cartagena Protocol's existing disclosure obligations and practices relating to the agricultural commodity trade ensure that, instead of institutionalizing a normative right to know and choose, a dictum of *caveat emptor* (let the buyer beware) prevails in this context instead. Furthermore, in the absence of supportive domestic regulations, such disclosure also leaves the onus upon importing countries to detect, verify and make useable (limited) disclosed information, and to do so by putting into place a complex technological infrastructure of monitoring, detecting and sampling.

In the absence of embracing ´advance informed agreement´, the more truncated disclosure requirements for the GMO commodity trade, and associated practices and conflicts, are thus now about standardization of sampling criteria, appropriate detection methods, and availability of testing protocols. These debates reflect divergent EU-US approaches to detection and testing, and broader disputes over facilitating trade versus meeting stringent domestic labeling and traceability laws. Disclosure in the Cartagena Protocol regime, particularly disclosure relating to the agricultural commodity trade, is thus yet another key global arena where this transatlantic conflict plays out.

Neither facilitating GMO trade nor implementing stringent labeling and traceability requirements is a compelling imperative yet for the vast majority of the South. For these countries, the driving imperative remains shifting the burden of providing information and soliciting consent to GMO exporters. In the absence of this, they have to contend with a "buyer beware" status quo. In response, some have instituted moratoria or bans[16], partly because of the technical complexity and enormous costs of alternative routes such as stringent labeling and traceability (the path taken by the EU),

[16]As more GM crops enter global trade, bans and moratoria may become less politically and technically feasible. It is also possible, however, that they may become the more common fall back option, given that testing and segregation will also gain enormously in complexity. Even though testing is required to monitor and enforce bans as well, a key difference is that the burden of responsibility is shared with those who might be violating the ban, i.e. the exporters. It is not only poor countries, moreover, that are resorting to bans and moratoria. Various EU countries have national level moratoria on GM crop approvals still in place. Germany, for example, recently announced a decision to impose a moratorium on growing genetically modified maize (International Herald Tribune, April 15).

and related efforts to realize co-existence of conventional, GM and organic agriculture[17]. With this, however, the compromise of prior informed consent, to prevent the two extremes of *caveat emptor* or outright bans, fails to take effect.

In analysing how disclosure is working (and where it is failing), my argument here is not that the Cartagena Protocol is irrelevant. Indeed, it has fostered a certain level of transparency about global GMO flows. Moreover, it has had a range of other effects, including awareness raising and empowering domestic constituencies supportive of biosafety concerns and the precautionary principle relating to GM crop use in the South (Gupta and Falkner 2006). As it currently stands, however, its disclosure obligations benefit least those who need them the most. In contrast to the original impetus for disclosure, originating in the normative demand of the vast majority of the South to be informed about GMO transfers, it is these countries that are left by the wayside in complex discussions about testing, sampling, detectability and thresholds. For these countries, governance by disclosure fails not so much in conferring a right to know, but in *not* conferring a right to be told, with the difference being that with the first, the onus to know may still rest on the one who is conferred this right, whereas in the second, it shifts to the one doing the telling.

If *caveat emptor* prevails for these countries, is transparency failing to fulfill its emancipatory and transformative potential? By way of conclusion, two alternative lines of argument can be made with regard to this question. First, one could argue, as many do, that unreasonable expectations are placed upon transparency and disclosure; and that transparency is clearly no panacea (cf. Brown 2002). Rather, transparency and disclosure – as all other governance norms and mechanisms – will mirror broader meta-normative and political (economic) conflicts shaping global governance and will acquire meaning and relevance in conjunction with other (non-disclosure)-based governance efforts. Hence, transparency, in and of itself, cannot be expected to be transformative.

A second argument sees transparency as itself a key theater for normative and

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[17] The EU itself had a moratorium in place from 1998 - 2004, until such time as it had fully established its current stringent regulatory framework calling for labeling and traceability (Gruere 2006).

political conflict. Thus, not only is it shaped by such meta-conflicts, but it also has the ability to shape these processes in turn (Mol 2006). If so, the prospects for empowerment remain alive, since norms and practices constantly evolve and are mutable (Florini 2008). Furthermore, the very fact that the transparency both shapes and is shaped by broader normative and political conflicts attests to its key importance in global environmental governance (and the need to subject its workings to scrutiny) (see also Langley 2001).

Referring back to the GMO case, a striking dynamic here is the veil of unknowability that hangs over future normative and political developments. Given the anticipatory nature of this governance challenge, it is not clear how markets for GM and non-GM crops will develop, which crops will be approved and win acceptance (or not) in key markets, how norms of risk and choice will evolve, and whom the evolving systems and practices of testing, sampling and verification will empower. If so, even if *caveat emptor* prevails, the shifting normative and political context within which it exists ensures its precarious status. What follows in its wake is not a foregone conclusion. What does seem to be a foregone conclusion, however, is that transparency and disclosure will, for better or worse, increasingly be a central battleground in global biosafety governance.

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