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The Impact of Diverging Transatlantic GMO Regulations on the Management of Natural Resources in Developing Countries

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Abstract

This paper discusses the implications of the diverging regulatory regimes on genetically modified organisms (GMOs) in Europe and the United States on developing countries. We argue that it is basically the use of Regulatory Impact Assessment (RIA) that helps explainm the permissive regulatory regime on GMOs in the U.S.; whereas the application of a rather strong version of the Precautionary Principle explains the highly preventive GMO regulation in Europe. Even though U.S. regulation seems to be more adequate in view of the experience with GM food and GM crops over the past decade, the European regulatory was adopted by most developing countries and is also entrenched in international treaties that deal with the cultivation of GM crops. This puzzling outcome may not seem to be rational from a classical political economy point of view where nation states are seen as utility maximizing agents. Yet, if we take into account the increasing competition for public trust in developed countries and the fact that public trust as a private political resource cannot be exchanged for money or political power, European behavior in developing countries becomes more rational as it initially appeared to be. By claiming to support the good (speak anti-GMO) non-state actors in developing countries, policy-makers in Europe are unlikely to be attacked by domestic anti-GMO activists (who have gained public trust) and likely to gain public trust themselves because they are reflecting widespread public views. However, we think that this strategy will not work on the long run, because governments in developing countries are not just passive victims of Western paternalism but will eventually contradict even if they might lose important donors, if it becomes obvious from experience that GM crops are not just of economic but also of environmental benefit. National academia in developing countries will play a core role making their voice heard.

1. Introduction

a) Diverging philosophies in environmental regulation

The EU and the United States differ in their philosophy guiding environmental regulation.

The U.S. system is generally based on the use of Regulatory Impact Analysis (RIA) that takes into account cost-benefit analysis (making trade-offs transparent) as well as value judgements (revealing social preferences). A basic aspect of RIA is the assumption that regulation must be based on learning: once more is known about a certain risk, regulation must be adjusted accordingly. Even though RIA proved to be a very useful tool in minimizing the environmental and occupational risks of industrial activities cost-effectively, the value judgments and political interests of incumbent governments largely influence the definitions of 'acceptable cost' and 'acceptable risk' and take political decisions accordingly (Farber 2000, Harlow 2004). Nevertheless, the federal system in the U.S. allows the states to adopt their own environmental policies if they think that the federal government ignores the facts that were accumulated through learning and just panders to its constituency.

In this article we argue that the E.U. regulatory system is in more troubles and less flexible to respond to inadequate environmental decision-making. The Precautionary Principle (PP) is at the core of regulatory policy decision-making. The PP, which is primarily used in risk management, is increasingly adopted not just European environmental law and also international environmental treaties (Hahn and Sunstein 2005). Even though the PP is based on the reasonable argument that scientific uncertainty should not prevent an authority from taking action against a certain substance or activity if there is a potential risk that it might damage the environment and human health, the exact definition remains unclear and therefore prone to political abuse. The strong version of the PP, which is increasingly favoured by environmentalists, is asking for reversal of the burden of proof (the applicant must prove that a product is safe) (Aerni 2001). This makes scientific risk assessment and cost-benefit analysis basically irrelevant for political decisions because the safety of a product can never be proven 100%, and as long as it is not proven, policy-decision makers continue to fund further risk assessment if public risk perception remains negative and the country sufficiently affluent. As a consequence, public risk perception becomes the main basis for risk management decisions (Foster et al 2000). Some would welcome this development claiming that it makes the process more democratic and transparent. Yet if science does no more influence risk management and regulation then the gap will not be filled by a 'concerned public' but by political interest groups that claim to represent the concerned public. These interest groups however may not have primarily the public interest group in mind but rather their private interest to thrive in the political arena (Aerni 2003).

b) Implications for GMO Regulation in Europe and the United States

The two different regulatory approaches had particular implications for the regulation of genetically modified organisms (GMO) in Europe and the United States; Europe's regulation has become highly preventive due to negative public risk perception while in the U.S., GMO regulation was gradually rendered more permissive due to the increasing amount of knowledge derived from laboratory research, cultivation in the field and human consumption over more than ten years (Bernauer 2005).

The diverging regulatory frameworks on GMOs also have implications for the use of agricultural biotechnology in developing countries. While the U.S. encourages developing countries to adopt a permissive approach toward GMOs – based on their own experience with

the new technology-, the EU feels that its preventive regulation would be more appropriate for these countries. From a political economy point of view, it seems quite clear why the US has an interest in inducing other countries to adopt its permissive regulation because it facilitates the export of its GM products (Aerni 2002).

c) Explaining the puzzling European behavior

Unlike US interests, the European interest of exporting preventive regulation to developing countries is not quite obvious. We argue that this strategy only makes sense if we take into account public trust as a political resource like money and political power. The success of the anti-GMO activists in winning public trust as advocates of the poor and the environment in Europe had a significant impact on the national and supranational policy levels in Europe. The problem with public trust as a private political resource is however that it cannot be exchanged for money or political power. A public interest group whose main asset is public trust may exchange it for money or political power, but then it risks to loose its public trust entirely because it would now be perceived as acting in private rather than the public interest. Therefore such a political group cannot afford to make bargains with actors that have money or political power and this turns politics into a zero-sum game that makes any sort of political compromise, the ultimate product of democracy, impossible. The result is political polarization and a tendency of politicians to uncritically embrace the political positions of those who have gained public trust, in our case the anti-GMO advocacy groups (Aerni 2003). The trend is then exported into developing countries through tied foreign aid, non-tariff trade barriers and the support of radical local opponents of GMOs in the national public debates in these countries. By means of selected empirical research results and revealing trends in development assistance, the paper explains the rationale behind the strategy of exporting political polarization and highlights its implications in developing countries.

2. The Political Economy of Environmental Regulation

The political economy of regulation is based on two basic assumptions that were derived from positive economic analysis and broad empirical research (Peltzman 1976, Bailey 1985). The first assumption argues that political agents primarily seek to maximize their utility (within the limits of bounded rationality). The second assumption claims that regulation works like a market: the demand for regulation comes from industry, which would like to have some state subsidies and trade protection, and the supply comes from the regulators that are willing to provide such special regulation, as long as they will get something in return from industry – for example a financial contribution to the next election campaign (Becker 1983).

Of course, these two assumptions are not able to explain the emergence of environmental regulation in the 1970s. At that time, environmental problems were affecting human health on a massive scale and there was a large bottom-up movement against the pollution of air, water and soil, especially in the United States that pioneered the early efforts of environmental regulation. There was a broad political compromise across all political parties to clean up the environment (Kern et al. 2001).

Today, however, environmental policy has become a rather mature policy area with lots of interest groups and lobbying organisations that primarily try to maintain access to scarce public resources. Therefore, the issue is no more ‘regulation’ versus ‘deregulation’ but ‘bad regulation’ (that only serves special interests and is ineffective) and ‘good regulation’ (that serves the public interest and is effective). In the United States, the Regulatory Impact Assessment (RIA) has become an effective instrument to make the trade-offs of regulation

more transparent by applying cost-benefit analysis, and to protect regulation from being hijacked by special interest groups. In the EU it is only the UK that has recently embraced the concept of RIA as the dominant tool of risk management. The prevailing tool in risk management in Europe is the Precautionary Principle, which, applied in its strong version, calls for a reverse of the burden of proof and thus makes any cost-benefit calculations obsolete.

In its communication on the Precautionary Principle in 2000, the EU explains in a convincing way, why the PP is a useful tool in risk management to deal with scientific uncertainty on a temporary basis[1]. However the communication stresses that that decisions to act (or not) in accordance with the PP are essentially political. Clear guidelines are still lacking for the weight of evidence needed to trigger the PP. Different standards of proof seem to be needed to invoke the Principle than for other regulatory actions (EU Commission 2000).

The lack of clear guidelines and the application of different standards make the Precautionary Principle prone to be hijacked by political interests and therefore its application might result in 'bad regulation'. A typical example of 'bad regulation' is the way most European countries currently regulate agricultural biotechnology. Even though various EU-sponsored risk assessment projects were not able to detect any indication that transgenic crops are more risky to human health and the environment than conventional crops, EU regulation continues to be highly restrictive and member states continue to advocate a total ban on GMOs invoking a strong version of the precautionary principle (Foster et al. 2000). There is no consideration of a cost-benefit analysis or scientific risk assessment and the importance of learning in the regulatory approach is completely ignored. It is also increasingly incompatible with the Principle of Proportionality that is often invoked in conjunction with the Precautionary Principle (EU Commission 2000).

In Switzerland, the Swiss Law on GMOs (Bundesgesetz über die Gentechnik im Ausserhumanen Bereich) (see http://www.admin.ch/ch/d/ff/2003/2778.pdf), which was passed in 2003 is based on the Precautionary Principle (Article 2) and uses a strict liability of no more than 30 years for the producers of such crops (Article 32). The seed industry regards this law basically as a de-facto ban because no insurance company is willing to offer insurance for a period of 30 years. In addition, in a largely redundant Swiss referendum, approved in November 2005, Swiss voters decided to ban agricultural production of GMOs in Switzerland for another five years.

Apart from Spain where the cultivation of Bt corn was approved in a limited area, European agriculture is therefore still largely devoid of transgenic crops and the number of field tests to learn more about potential risks decreased significantly over the past years (Lleureux et al. 2003). In this context, Gaskell and Bauer (2001) argued already in 2001 that agricultural biotechnology is a typical example of a policy area where bargaining and political compromise largely failed.

Joachim van den Daele (1996), who conducted a government-sponsored participatory project with political stakeholders on the risk and benefits of herbicide-resistant soybean in Germany, had to learn that environmental organizations prefer to quit the entire participatory initiative than to agree to a joint statement, with private-sector stakeholders involved, based on the findings of the subcontracted research, obtained during the period of the project. He therefore concluded indirectly that certain interest groups might even benefit from avoiding bargains and political compromise. But if that is true then this would clearly contradict the basic insight in political economy and game theory that an actor would always agree to a political compromise or bargain if it results in a personal net material benefit (Gintis 2005).

This would then also mean that there is a need for more positive empirical research on the politics of GMOs that goes beyond the classic laws of political economy. In this context, the author developed an approach to investigate stakeholder attitudes and interests in the public debates on agricultural biotechnology in different countries to find out the influence of different cultural backgrounds, political systems and stakeholder groups in explaining the formation of public opinion and the outcome of political decision-making processes (Aerni 2002).

3. Stakeholder attitudes towards agricultural biotechnology in the Philippines, Mexico and South Africa

Three surveys on the views on agricultural biotechnology expressed by the political stakeholders involved in the public debates in developing countries have been conducted in the Philippines (1997), Mexico (2000) and South Africa (2000).
The choice of three countries with very different cultural, political, ecological and political circumstances is expected to give more validity to results that are observed in all three surveys. The methodological approach is based on a unique combination of perception pattern analysis and social network analysis (Laumann and Knoke 1987, Aerni 2002). It is a tool to assess the perception, interests and the political influences of the stakeholders involved in the national public debate on GMOs. These stakeholders, who claim to represent a particular constituency, help shaping public perception and political decisions and therefore are of crucial importance to the understanding of modern governance structures.

a) Survey Participants

The relevant stakeholders in the public debates on agricultural biotechnology were selected in each country with the help of key informants and the screening of mass media articles related to the topic. This approach is used in social network analysis (Laumann and Knoke 1987).

The stakeholders that finally participated in the surveys were equally spread across the political spectrum including representatives from government, academia, business, NGOs, churches, consumer organizations, producer organizations, the mass media, legislature and international organizations.

Table 1 shows the distribution of survey participants across the different stakeholder groups:

	South Africa	Mexico	Philippines
Return rate	*55%*	*72%*	*81%*
Government	8	14	15
NGO/Church	17	12	20
Business	9	7	8
Academia	12	8	5
Legislature	1	3	4
Intl.Donors	1	2	3
Press		3	4
CGIAR		3	6
Total	48	52	65

Table 1: Institutional affiliation of survey participants in South Africa, Mexico and the Philippines

The return rate of questionnaires was different in each country due to different reasons (time available for the survey, familiarity with the topic within each institutional group, presence of the respective institutional group). In spite of differences in participation rates, the shares of presumed proponents and opponents of agricultural biotechnology was considered to be balanced in all three countries (confirmed by the participants themselves in a workshop on the survey results carried out in the countries one year after the survey). In countries where one side was more willing to participate, more efforts were invested in finding substitutes for those who were unwilling to participate on the other side.

b) Selected results of the three surveys

The stakeholders were asked to complete a semi-standardized questionnaire where they had to assess statements and pre-structured answers to certain questions in a scale from 1-5 (e.g. 1=not important at all, 5=very important). The results of the first part of the survey (see Figure 1) revealed that, on average, the respondents in the Philippines, Mexico and South Africa believe that agricultural biotechnology has the potential to solve important problems in agriculture such as drought (*Drought*), pest infestation (*Pests*), plant disease (*Disease*) and high use of pesticides *(Pesticides)*.

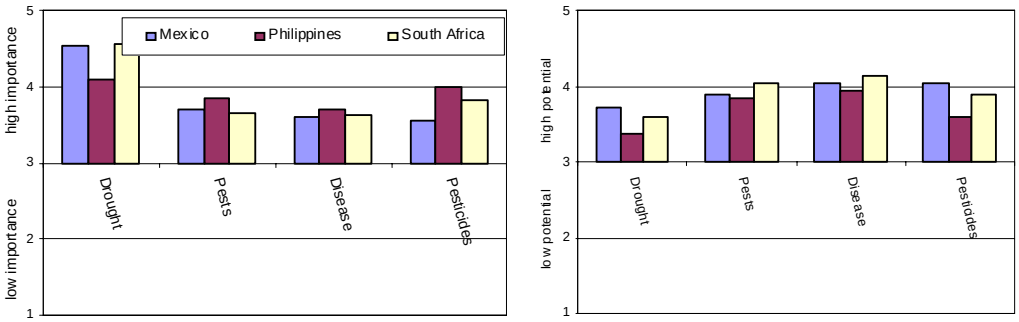

Figure 1: The importance of the problems in agriculture and the potential of genetic engineering for solving them (assessed in a scale from one to five)

The results of the second part (see Figure 2) show that respondents generally disagreed with the statement that genetically modified crops would pose a significant risk to consumer health *(health risk)* and agreed that genetic engineering is just a new tool that helps solving problems than cannot be solved with conventional breeding methods *(just a new tool +)*. They also approved of the statement that genetically engineered crops may eventually contribute to future food security *(food security +)*. In turn, they showed significant concerns regarding the potential negative impacts of such crops on the natural environment *(environment -)* and the difficulty to implement strict regulation *(implementation -)*.

This indicates that a majority of the respondents in these countries tend to have a rather pragmatic view by recognizing the potential of biotechnology to address certain problems in agriculture. Yet, they also emphasize the importance of improving access to markets, rural infrastructure and biosafety capacity building in order to make this technology profitable for farmers in marginal areas and ensure its safe and responsible use.

A common denominator is the insight that agricultural biotechnology needs to be perceived as a home-grown technology in order to be accepted and to become really useful. This again would require much more attention to the role of local universities in technology transfer and capacity building efforts.

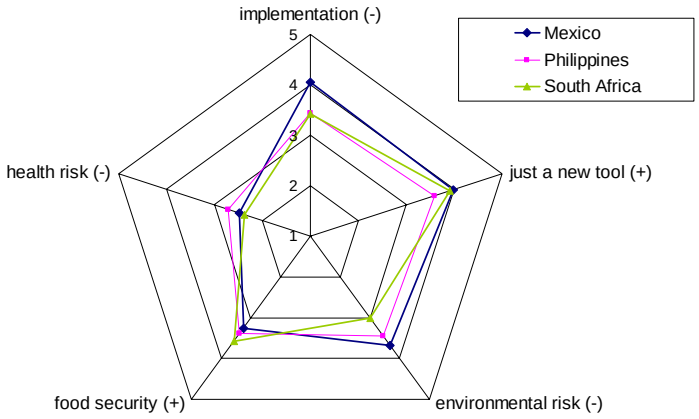

Figure 2: Average Assessment of the Positive and Negative Assessments of Genetic Engineering in Agriculture

4. Homegrown and pragmatic versus foreign and extremist views in developing countries?

This pragmatic view revealed by a majority of the survey participants differs sharply from the stronger 'genophobic' view expressed by a few local environmental NGOs in the three surveys. A common observation in all three countries was that these local NGOs are often affiliated with and funded by a larger global anti-biotech movement. Even though these NGOs may have local roots they are increasingly dependent on foreign donors (international business, international NGOs and Western donor agencies). In the Philippines, it was the interception of transgenic material from Switzerland, organized and funded by Greenpeace Switzerland in 1995, that had a decisive influence on the national public debate on agricultural biotechnology[2]. In South Africa, five out of six sponsors of Biowatch SA, the leading local anti-biotech NGO, are foreign sponsors (http://www.biowatch.org.za), and in Mexico, the most important activist group against GMOs is Greenpeace Mexico. Judging from the recent strategic decision of Greenpeace Switzerland to shift more resources from domestic activities to campaigns in developing countries with new offices in China, India and possibly Africa (Schuler 2004), indicates that is trend of foreign NGO involvement in local debates in developing countries is likely to become stronger in future; one wonders why there is a need for the Swiss branch of Greenpeace to invest around US$ 3 Million for international campaign work, something that would clearly belongs the realm of Greenpeace International.

Personal communication with a local representative of Greenpeace Mexico revealed a growing dissatisfaction with the prevailing franchising system of the organization in which the basic strategy of protest and the selection of protest topics are determined in the headquarters of Europe while the local representatives are just asked to execute the strategy without paying attention to local circumstances. This observation seems to chime well with the findings of Wahl's research on the franchising strategies of large international NGOs (Wahl, 1998) and the punitive actions of Greenpeace International against local Greenpeace offices that refuse to participate in certain international campaigns they consider inadequate for their respective country (Der Spiegel, 2004). The recent announcement of Greenpeace Switzerland to shift more funding from national campaigns to campaigns in developing countries (Schuler, 2005) shows that even national branches of Greenpeace in Europe are increasingly interested in shaping public opinion abroad. As a result of the dependence on the funding of foreign activist groups, many local NGOs tend to adopt the political agenda of their foreign donors and often abandon their initial struggles for particular local concerns (Blanton 2002). Yet, not just NGOs but also national governments in Europe seem to be increasingly eager to politicize the subject of GMOs by funding radical opposition groups in developing countries under such benign-sounding initiatives as 'food security and environmental quality', 'biosafety capacity building', 'strengthening civil society' or 'empowerment' (Aerni and Bernauer 2006)

This indicates that stakeholders in developed countries that are active in developing countries tend to have little respect for bottom-up movements in these countries and, in addition, contribute to political polarization in this particular policy area in poorer countries.

a) Do large Western advocacy groups have vested interests?

These observations indicate that the normative stances often heard in the West in favor or against the use agricultural biotechnology in developing countries are often more attached to vested interests rather than genuine concerns about poor people in developing countries.

These vested interests are usually associated with transnational agribusiness companies who aggressively pushed for permissive GMO legislation in the 1990s. Yet, their lobbying and PR efforts seemed to have been largely ineffective in view of their controversial public image and the relatively low number of countries that have embraced transgenic crops in commercial agriculture. This stands in strong contrast to the success of large international, and particularly European NGOs in shaping a negative public opinion on GMOs through well-staged media-campaigns. In this regard, Paarlberg seems to be correct when he suggests that the European stakeholders against GMOs were more successful in persuading developing countries and international institutions to adopt their preferred preventive approach of GMOs regulation (Paarlberg, 2003). But if this was really a successful example of power politics in which the European Union managed to export its regulatory approach through collaboration with civil society and multilateral institutions, then Paarlberg would also have to explain why it is so advantageous for Europe to reject agricultural biotechnology - and there seems to be the real contradiction. Why should Europe oppose a new technology that may eventually contribute to the transformation of the existing polluting petrochemical and agrochemical industry into a more efficient and sustainable biological industry (CSIS 2005, Cantely 2004)? Its highly constraining regulatory policy has already caused many skilled researchers in agricultural biotechnology to move to the United States and the stigmatization of genetic engineering has induced many European agribusiness firms to freeze their agri-biotech research programs (Lheureux et al. 2003). A plausible explanation might therefore not be related to power politics but the increasing importance of public trust in the polarized debate on agricultural biotechnology.

b) The private management of public trust in developed countries

In an affluent, complex and uncertain world, people increasingly resent the presence of risks that are caused by decisions elsewhere and long for personal autonomy, orientation and new certainties that allow them to interpret new events quickly and at low cost (Luhmann, 1979; Beck, 2000). Many new political right-wing (e.g. blaming immigrants) and left-wing groups (e.g. blaming new technologies and economic globalization) in the public arena appear to address this demand successfully by reducing the complexity of issues and providing new certainties through the provision of scapegoats (Douglas, 1995). The result is a psychological interpretation of social matters: what makes a social action good is the character of those who engage in it, not the action itself (Sennett, 1976). As a consequence public actors are increasingly judged by their presumed motives rather than their performance (Lipset & Schneider, 1980). Since the European public trusts the motives of Anti-GMO-campaigners to fight for the public interest, they have acquired 'public trust', not least by spreading distrust towards decision-makers in business and government who are portrayed as self-interested and indifferent toward public concerns. In other words, it is no more necessary to conduct investigative journalism and attack companies for what they do (based on the evidence gathered), but to just denounce them for what they stand for. 'Public trust' is therefore increasingly managed as a private good that ensures public legitimacy and allows an organization to survive in the public arena. Public trust can therefore be regarded as a scarce political resource like 'money' and 'power' (Aerni 2003). As a consequence, governments and multinational corporations (who represent power and money) tend to court protest organizations (who have gained public trust), respond to their concerns and offer co-operation in the hope of being dropped as a target of protest. Yet, unlike money and power, public trust is not a tradeable good; once an interest group would be willing to exchange public trust for political power or money (e.g. by endorsing the pro-GMO policies of certain governments or multinational companies) the public would cease to regard this group as acting in the public interest and would withdraw public trust immediately. This may explain why NGOs that are focused on advocacy work and whose main political asset is public trust, as confirmed by

various surveys (Eurobarometer, 2003; World Economic Forum, 2003), rarely seek bargains with government or industry. Willingness to compromise, for these actors, would mean to abandon an important protest topic and run the risk of being associated with those who are being denounced as enemies of the public interest, including the poor and the environment (Luhmann, 1993).

This private management of public trust has therefore produced political polarization and may render compromise increasingly impossible. For these advocacy groups, public trust is a crucial political currency that has to be used strategically, chiefly by pretending to seek consensus and dialogue but never actually accepting a compromise with those who are accused of pursuing self-serving goals. To be willing to compromise would also mean to abandon an important protest topic, which cannot be in the interest of a protest organisation . In fact, a large part of public trust in advocacy groups tends to be based on mistrust towards stakeholders that represent money and power (Luhmann 1993).

The uncompromising behavior of many advocacy groups, motivated by efforts to appropriate public trust, also led to changes in the strategies of business and government. Business is embracing corporate social responsibility strategies that tend to portray them as concerned charities rather than profit-oriented companies (The Economist, 2005) and governments tend to endorse the popular political positions of advocacy groups in the hope of impressing voters as concerned citizens that are highly skeptical about the process of globalization; the main aim of these strategies is to be perceived as less self-interested and therefore more trustworthy in public. It is based on the fatal insight that public trust can no more be gained by delivering value/performance for money/votes but only by pretending to have good motives and act in the public interest.

c) Implications for the GM Debate

The tendency to just embrace stakeholders that appear to be in possession of public trust is an indication that European policy makers are increasingly merely responding to public opinion rather than shaping it themselves. If we consider the trend toward the private management of public trust, this strategy may indeed makes sense as the most effective way to get the votes necessary for re-election. This can best be illustrated by taking the case of European government agencies that tend to adopt a critical stance towards GMOs and support anti-GMO activists, not because they are convinced that they need to protect the consumer and the environment from a potentially catastrophic new technology but because they know that in order to get re-elected they need to win public's favor and trust.

But why were European NGOs so successful in gaining public trust and shaping public opinion in the first place? The changing meaning of 'risk' in affluent societies (Luhmann 1993) and the association of agricultural biotechnology with 'US interests' may be one important reason. In the public controversy over GMOs where 'risk' is highly politicized and powerful interests are perceived to prevail over public concerns, public trust has become a crucial political resource in agri-biotech policy – while science has lost its role as the ultimate arbitrator

d) The role of science in international trade disputes

In the 1970s and 1980s most observers and stakeholders expected that science would enjoy enough public trust to be the arbiter in disputes over the risks and benefits of agri-biotechnology and help to achieve consensus in the design of appropriate regulation. Part of the intent of Uruguay round of the GATT agreement (General Agreement on Trade and

Tariffs) was to make science the only basis for imposing trade restrictions in the name of concerns related to human health and the environment. However, since the 1990s, science has for a variety of reasons lost its role as an impartial arbiter in the global agri-biotech controversy. In the same vein, science and government have lost their monopoly as providers of the public good "trust in technology", a monopoly they enjoyed especially during the Cold War. This produced an increase in perceived uncertainty in public and has turned public trust into a crucial "currency" of the stakeholders involved in the global agri-biotech controversy – those who obtain more of this currency are more likely to gain public legitimacy and to influence public opinion through their information campaigns. Consequently they also increasingly shape international consumer markets and regulatory policy.

e) Defining the Role of NGOs

Even though international NGOs and environmental advocacy groups in particular may have an intrinsic motivation to make the world a better place and indeed contribute to a lot to sustainable grassroots initiatives and people's empowerment, the sudden rise in funding for these advocacy groups due to their popularity, mostly as spontaneous actors in the mass media, has led to a sudden increase in numbers of advocacy groups and subsequently more competition for the consistent funding pie. The struggle to survive in a more competitive funding environment forced them to take more strategic decisions with a focus on issue management – at the expense of their intrinsic motivation and their core mission. In other words, many NGOs became normal political stakeholders who try to preserve their interests in the political arena. The role of these NGOs as representatives of civil society and partners in the global governance of sustainable development was officially recognized in the Agenda 21[3] , a 300-page plan on how to achieve sustainable development in the 21st century, approved by the participants of the United Nations Conference on Environment and Development (UNCED) in Rio in 1992 and essentially reaffirmed in the Rio+10 Conference in Johannesburg in 2002. The definition of the role and the intentions of NGOs outlined in the Agenda 21's initiative is as independent and responsible representatives of civil society that defend the public interest in the political arena is however inadequate and therefore co-responsible for the current biotech hypocrisies that prevent rather than promote action in favor of sustainable development. NGOs cannot just represent the public interest (as they are assumed to in Agenda 21) but also have a private interest to ensure their own survival as an organization by eventually expand their activities and ensure continuous access to funding sources. The international community should recognize that NGOs with a focus on advocacy are not per se organizations that emerged as a natural voice of the poor and the natural environment in the political arena. Mostly they face the principal-agent problems (Ross 1973) (e.g. between the leading representatives and the people they claim to represent) that increase with the growing maturity of the movement (as movement identity becomes more important than concerted action). Moreover, they also have an interest in keeping their share in the funding pie through the private management of public trust especially if they approach the mature phase of their life-cycle.

f) Growing Political Polarization

The private management of public trust engenders uncompromising behavior on the side of NGOs and forces corporations to portray themselves as charities (in the hope to be perceived as less self-interested by the public and therefore more trustworthy) rather than profit-seeking enterprises. This argument explains why the global agri-biotech debate has become more acrimonious, personal and moral while public policies show few signs of responsible leadership. Neither NGOs nor corporations are able to provide public goods (because both have first of all the private interest to survive and expand as organizations), nor do they have

the political legitimacy to do so (they are not elected). It is the task of democratically elected governments to manage public goods in a coordinated effort with NGOs, international organizations, corporations and other stakeholders. However, nowadays politicians in government who want to be re-elected tend prefer to either simply endorse NGO protest activities (knowing that they enjoy public trust) or provide lobbying groups with favorable regulation in return for votes and campaign finance. In many cases they do both at the same time. It allows them to be popular and get votes without bearing the costs and frustrations of designing and advocating an elaborated public policy that may alienate them from their traditional constituency on the short run but provide benefits for the public at large on the long run.

g) Extending the Moral Battleground

In their struggle to appropriate and leverage public trust, political stakeholders from rich countries have not just shaped public policy in their home country but opened a new battleground in poor parts of the world (Bernauer 2005). They have done so in part because of the increasing importance to be perceived at home as acting to the benefit of developing countries and, implicitly, in the public interest. Such a perception promises to generate public trust as a political currency. It also explains the increasing importance of foreign policy as a trump card in domestic politics to legitimize or de-legitimize the technology. Corporate press releases and NGO position papers in Europe and the United States almost always contain a reference to the role of agricultural biotechnology in developing countries, either as a curse or a possible salvation to poor and hungry people in Africa. An indication that European NGOs will focus even more in anti-GMO campaigns in developing countries is the fact that GMOs have ceased to be an important political topic in Europe where most countries decided to keep the crops out of domestic agriculture and supermarkets.

6. Responses in Developing Countries

The main view common to most stakeholders interviewed personally in the three surveys was that Europe and the United States should assist researchers in developing countries to learn how to use agricultural biotechnology to address the urgent problems in their country. Once developing countries are able to address their problems in agriculture with their own products (through technology transfer, technical training and financial support), agricultural biotechnology may be perceived as a homegrown rather than an imported technology and, consequently, find more supporters also among nationalist politicians. This argument finds further confirmation in the fact that the public attitudes towards GMOs in developing countries with advanced capacities in biotechnology research such as Cuba, Colombia, China, India and Thailand proved to be even more positive in their public attitude than in the United States (Hoban 2004). Even though it is very difficult to convert interesting crop research conducted at local research institutes and universities into useful products for farmers, more investment in training, collaboration with the private sector and experience in complying with the regulatory requirements may help changing the situation soon (Cohen and Paarlberg 2004). The new initiatives launched this year by the UN Millennium Development Project Task Force on Science, Technology and Innovation (MDP/STI, 2005) and the UK Commission for Africa (2005) intend among other things to re-define the role of universities in development strategies and promote science, technology and innovation in the developing world. These initiative are actually in accordance with the original objectives of Agenda 21 that explicitly calls for improving technical training and mobilizing business to improve sustainable development in Africa – unfortunately, this part was largely ignored over the past decade and technology was increasingly treated as a source of environmental problems and poverty rather than a potential solution (Eurobarometer 2004), Anyhow, it may be a first sign,

that the real demands of the developing world finally get more attention within the international donor community; it would also be a strong indication that rhetoric might finally be replaced by action.

a) Academia in developing countries must act as an intermediator

National academia in all three countries may become key in counteracting the polarizing forces largely fuelled by foreign stakeholders. When asked how much trust different institutional groups are perceived to have in public (in a scale from 1-5), respondents of in Mexico and South Africa still considered academia to be the most trustworthy stakeholder in the public debate on agricultural biotechnology (ahead of churches, NGOs, consumer organizations etc.) (see Figure 4 on South Africa and Mexico).

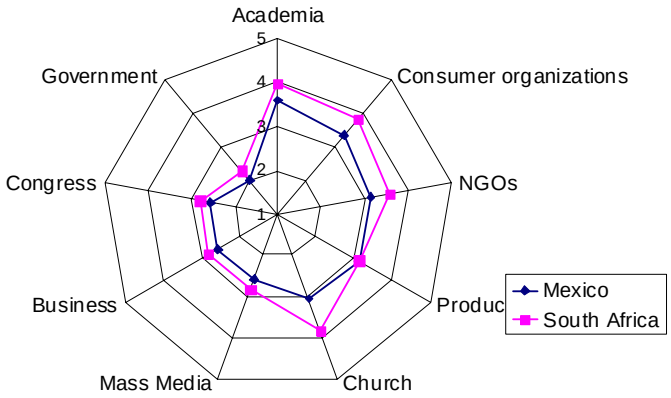

Figure 4: Public Trust in Institutions (1=no public trust, 5=lots of public trust)

Academia may use this political resource to build bridges between the different domestic interest groups and facilitate political compromise on the sustainable use of agricultural biotechnology. With public trust as its main asset in the political arena academia would have the potential to influence public opinion more than other non-state actors and consequently be able to exert strong leadership on environmental, development and technology policy.

b) A changing debate over time

The strategy of European stakeholders to recruit radical stakeholders in developing countries to mobilize against agricultural biotechnology and win public trust in the public debate back home may turn out to be a ineffective on the long run, if academia eventually asserts its scientific authority and uses its public trust to facilitate political compromise among the different parties in developing countries. The surveys showed that pragmatic views are already prevailing in these countries and therefore it should not be hard to make them influence political decisions.
In the short term, the strategy of funding local stakeholders to advance one's own political interests has a lot to do with paternalism, and it breeds radicalism and uncompromising behavior in developing countries. The WTO dispute over the EU's agri-biotech approval regulation provides ample illustration. It forces many developing countries to side with one or the other party in the trade dispute. Thus it crowds out systematic domestic debates on what kinds of agri-biotech applications developing countries may want and need. It generates

regulatory schemes, imposed by rich on poor countries, whose implementation is costly and incongruent with domestic interests. It limits access to markets in industrialized countries of certain agricultural products from developing countries. It hinders or prevents the adoption of agri-biotechnology applications that may be useful for particular developing countries, and it may impose applications that have only very limited benefits for poor countries. It may also reduce overall public and private investments in R&D in agricultural biotechnology. In other words, it is a typical example of 'bad regulation' that only serves special interests and is ineffective in addressing the urgent environmental and development problems.

In the long term, this strategy may however not be sustainable because the vocal claims of biotech critics regarding the potential catastrophic health and environmental risks increasingly contradict the experience in the field and the vast majority of scientific publications on that subject. It will then become increasingly difficult for biotech-adverse interest groups to sustain public fears of the technology, particularly as bottom-up demand for certain agri-biotech applications in developing countries increases (e.g Bt cotton) (Chandak and Gupta 2005). Conversely, it will become increasingly difficult for biotech proponents to sustain their predictions of large-scale benefits for developing countries as it becomes clear that the dream of leapfrogging in agricultural development through a doubly green revolution or 'gene' revolution (Conway 1999) would require a much more serious commitment from public sector stakeholders.

Consequently, the public is likely to withdraw its trust in the most vocal non-state actors of the public arena on agricultural biotechnology because their motives will be increasingly questioned. It may eventually force them to focus on their core activities again: NGOs may reassume their core role as reliable watchdogs in society and multinational companies will concentrate again on profit-seeking (within the boundaries of regulation) rather than public attention-seeking (corporate social responsibility activities). The subsequent loss of influence of vocal non-state actor in regulatory policy would decrease political polarization and increase the chances that 'good regulation' that serves the public interest and is effective in dealing with the important environmental and development problems will be adopted. This 'good regulation' may still include the Precautionary Principle for the purpose of overall guidance in risk decision making. But it would also include Regulatory Impact Assessments (RIA) (cost-benefit analysis) and learn from the experiences with other regulatory frameworks that deal with managing the risks and benefits of GM crops. This would all make GMO regulation less prone to be hijacked by political interest groups – at least in developing countries.

7. Conclusions

In this paper we argue that the political economy of regulation is no more able to explain why political compromise on the issue of GMOs in Europe proved to be impossible. We also observed that environmental policy has become a mature policy area in Europe and the United States meaning that many political interest groups are involved that try to shape policy according their views and interests. While the practice of Regulatory Impact Assessment (RIA) is a useful tool in the US to make the trade-offs of regulation transparent and decrease the possibilities of political interest groups in hijacking a regulatory agenda, the Precautionary Principle (PP), as interpreted and applied in Europe, lacks this capacity, and therefore ends up furthering special interests rather than the public interest. The radical application of the PP in many European countries has resulted in a de-facto ban on GMOs. This de-facto ban may look rational from the point of view of a politician who wants to be re-elected and therefore prefers to endorse public concerns on GMOs at the expense of the negative long-term economic consequences for the country. But this however questions the assumption that states are rational and self-interested agents that aim at increasing their power and wealth in relation

to other nations. These inconsistencies with the laws of classical political economy indicate that there might also be other factors that determine a country's stance toward GMOs such as the local culture and tradition, historical background and the political system. In order to find out more about these additional factors, three surveys were conducted in three different developing countries, the Philippines, Mexico and South Africa, to find out to what extent different policies on agricultural biotechnology reflect the different political, economic, cultural and environmental contexts.

The surveys results showed that a majority of the stakeholders that participated in the public debates in the Philippines, Mexico and South Africa felt that agricultural biotechnology had the potential to solve important problems in agriculture and did not pose a significant health risk to consumers. Yet, there were also concerns regarding the potential negative impact of such crops on the natural environment and the difficulties of implementing strict regulation. However, overall, a majority of the respondents proved to have a rather pragmatic view emphasizing the potential of genetic engineering to address important problems in agriculture such as drought, pest infestation, plant disease and high use of pesticides but also pointing out the importance of non-agronomic problems such as lack of market access, investment in R&D, and infrastructure. The results of the surveys suggest that the differences in perception in the Philippines, Mexico and South Africa were often related to different historical, political, ecological and socio-economic conditions.

The results obtained in the policy network analysis revealed that many local NGOs that are active in protesting against or promoting agricultural biotechnology have established links to international stakeholders (NGOs and international organizations), which play a key role in the choice and distribution of information through their organized campaigns. As a result, many of these NGOs tend to adopt the political agenda of their foreign donors and often abandon their initial struggles for particular local concerns. The policy network analysis suggested that this is particularly true for anti-biotech NGOs that are mostly sponsored by European stakeholders. This result seems to be in accordance with Robert Paarlberg's argument (Paarlberg 2003) that Europe has successfully exported its preventive GMO regulatory system to developing countries by working through multilateral institutions and in collaboration with civil society groups. However, this argument does not explain why Europe should have an interest to export its preventive regulatory system and reject the use of agricultural biotechnology. We argue that it is the competition for public trust rather than power politics that induces European stakeholders to win over stakeholders in developing countries. Public trust is defined as a political resource like money and political power. Yet, since public trust cannot be exchanged for money or political power, it fuels political polarization - and it is this polarization that is exported from Europe to developing countries. In the case of agricultural biotechnology, a European anti-GMO activists may have public trust but the topic is becoming less exciting in Europe where the introduction of GM crops and GM food largely failed. As a result, they tend to focus increasingly on developing countries that are thinking of adopting this new technology. They funds non-state actors in these countries that basically share their views, or learn to share their views. By inviting them to jointly campaign in their respective European country, they can claim to defend the interests of the poor against the forces of new technologies and globalization. As such they can still gain public-attention with GMO campaigns and manage public trust, even if their country has already decided to ban GMOs. Policy-decision makers that would like to gain public trust but cannot get it from the advocacy groups, tend, instead, to just adopt the views of these groups, especially in development assistance policy, where the negative economic impact of anti-GMO policies is not felt in their own countries. This would explain why preventive European GMO regulation is so widely adopted in developing countries (especially in those countries that depend on its foreign aid or market access) and why their may be a rational strategy behind it.

Paarlberg portrays developing countries largely as victims of foreign interference and does not address the potential of domestic academic leadership in the public debates on agricultural biotechnology in developing countries. However, respondents in the three surveys believed that the public still trusts national academia more than NGOs and other public interest groups and as such enjoys considerable public authority. Academia may use this valuable political resource of public trust to curb foreign interference and create a domestic consensus to pursue a more pragmatic way in selectively promoting the use of biotechnology to address certain problems in domestic agriculture that cannot be solved through conventional breeding methods. In their 2005 reports, the UN Millennium Development Project Task Force on Science, Technology and Innovation (MDP/STI, 2005) and the UK Commission for Africa (2005) have recognized the important role of academia in developing countries and advocate a substantial increase in funding for institutions of higher education in the developing world. If their recommendations will be adopted by the major national and international donor agencies, then the political deadlock about the use of GMOs in developing countries might eventually be resolved thanks to the more influential mediator role of academia.

References

Aerni, P. (2002) Stakeholder Attitudes towards the Risks and Benefits of Agricultural Biotechnology in Developing Countries: A Comparison between Mexico and the Philippines. Risk Analysis 22 (6): 1123-37.

Aerni, P. (2003) Private Management of Public Trust. CIS Working Paper 2-2003.

Aerni, P. (2004) Risk, Regulation and Innovation: the Case of Aquaculture and Transgenic Fish. Aquatic Sciences 66 (3): 327-41.

Aerni, P. and Bernauer, T. (2006) Stakeholder Attitudes toward GMOs in the Philippines, Mexico and South Africa: the Issue of Public Trust. World Development, Forthcoming in March 2006.

Aerni, P. and Rieder, P. (2001) Public Policy responses to Biotechnology". Chapter BG6.58.9.2 in Our Fragile World: Challenges and Opportunities for Sustainable Development. Encyclopaedia of Life Support Systems (ELOSS), UNESCO, Paris. May 2001.

Bailey, E. (1985) Public Regulation: New Perspectives on Institutions and Policies. Cambridge, MA: MIT Press.

Beck, U. (2000) Living Your Own Life in a Runaway World: Individualization, Globalization and Politics. In: W. Hutton and Giddens A. (eds.) On The Edge: Living with Global Capitalism. London: Jonathan Cape.

Becker, G. (1983) A Theory of Competiton among Pressure Groups for Political Influence. Quarterly Journal of Economics 98: 371-400.

Bernauer, T. (2005). Causes and consequences of international trade conflict over agricultural biotechnology. International Journal of Biotechnology 7(1/2/3), 7 – 2

Blanton, T. (2002) The World's Right to Know. Foreign Policy July-August 2002: 50-58.

Bob, C. (2002) Merchants of Morality. Foreign Policy July-August 2002: 36-45

Cantley, M. (2004). How should public policy respond to the challenges of modern biotechnology? Current Opinion in Biotechnology 15(3), 258-63.Carson, R. (1962) Silent Spring. New York: Houghton Mifflin Company.

Cohen, J. & Paarlberg, R. (2004) Unlocking Crop Biotechnology in Developing Countries - A Report from the Field. World Development 32(9):1563-73.

CSIS Report (2005) Biotechnology and Agriculture in 2020. Washington D.C.: Center for Strategic and International Studies.

Der Spiegel (2004) Wir brauchen Fantasie, by S. Knauer, Der Spiegel, 45, 66-70.

EU Commission (2000), Communication on the Precautionary Principle, Brussels. http://europa.eu.int/comm/environment/docum/20001_en.htm

Eurobarometer 224 (2005b) Europeans, Science and Technology. Brussels, Belgium: The Commission of the European Union.

Eurobarometer 225 (2005a) Social Values, Science and Technology. Brussels, Belgium: The Comission of the European Union.

Farber, D. (2000) Eco-pragmatism: Making Sensible Environmental Decisions in an Uncertain World. Chicago: The University of Chicago Press.

Foster, K. R. ,Vecchia, P., Repacholi, M. H. (2000) Science and the Precautionary Principle. Science 288: 979-81.

Gabriel, K. R. (1981). Biplot display of multivariate matrices for inspection of data and diagnosis'. In: V. Barnett (ed.) Interpreting Multivariate Data. London: John Wiley & Sons.

Gaskell, G. & Bauer, M. (2001) (eds) Biotechnology 1996-2000: The years of controversy. London: Science Museum Press.

Gintis, H. (2000) Game Theory Evolving. Princeton: Princeton University Press.

Gupta, A. K. & Chandak V. (2005) Agricultural biotechnology in India: Ethics, Business and Politics. International Journal of Biotechnology 7(1/2/3): 212-227.

Hahn, R. W. & Sunstein, C. R. (2005) The Precautionary Principle as a Basis for Decision Making. The Economists' Voice 2(2), Article 8. http://www.bepress.com/ev/vol2/iss2/art8/

Harlow, S. D. (2004) Science-based Trade Disputes: A New Challenge in Harmonizing the Evidentiary System of Law and Science. Risk Analysis Vol 24(2): 434-459.Hayek, F. A. (1988) The Fatal Conceit. Chicago: University of Chicago Press, Chicago.

Kern, K., Jörgens, H. and Jänicke, M. (2001) The Diffusion of Environmental Policy Innovations: A Contribution to the Globalization of Environmental Policy.Berlin: WZB Discussion Paper. http://skylla.wz-berlin.de/pdf/2001/ii01-302.pdf

Laumann, E. O. & D. Knoke (1987). The organizational state. Social choice in national policy domains. Madison: the Unversity of Wisconsin Press.

Lheureux, K., Libeaux-Dulos, M., Nilsagård, H., Rodriguez-Cerezo, E., Menrad, K., Menrad, M., Vorgrimler, D. (2003) Review of GMOs under Research and Development and in the Pipeline in Europe. Brussels: European Science and Technology Observatory. http://www.jrc.es/gmoreview.pdf

Lipset, S.M. and Schneider, W. (1983) "The Confidence Gap: Business, Labor and Government in the Public Mind". New York: The Free Press.

Luhmann, N. (1979). Trust and Power. New York: John Wiley & Sons, 1979.

Luhmann, N. (1993). Risk: As sociological theory. Hawthorne: Aldine de Gruyter.

Nye, J. (2002) The Paradox of American Power. New York: Oxford University Press.

Paarlberg, R. (2003). Reinvigorating genetically modified crops. Issues in Science and Technology 19 (3), 86-92.

Peltzman, S. (1976) Towards a More General Theory of Regulation. Journal of Law and Economics 23: 211-40

Schuler, K. (2004). Hart an die Grenzen und weit darüber hinaus. Zürich: Greenpeace Magazin Schweiz, April Issue.

Sennett, R. (1976) "The Fall of Public Man". New York: W.W. Norton & Company.

Sjöberg, L. (2003). Attitudes and Risks Perceptions of Stakeholders in a Nuclear Waste Siting Issue. Risk Analysis 23 (4): 739-49.

UN Millennium Development Project Task Force on Science, Technology and Innovation. (MDP/STI) (2005). Innovation: Applying Knowledge in Development. London, UK: Earthscan Publishing.

United Nations Trade and Development Conference (UNCTAD) (2004) The Biotechnology Promise. Geneva, Switzerland: UNCTAD Report.

Van den Daele, W. (1996) Grüne Gentechnik im Widerstreit. Modell einer partizipativen Technikfolgenabschätzung zum Einsatz transgener herbizidresistenter Pflanzen. Weinheim: VCH.

Wahl, P. (1998). Von NGO-Multis, McGreenpeace und der Netzwerkguerilla. Peripherie 71, 55-68.

World Economic Forum (WEF) (2003). Declining Trust Foremost a Leadership Problem. Press Release, January 14. http://www.weforum.org/pdf/AM_2003/Trust_in_Leaders.pdf

Zweifel, P. & Heller, R. H. (1997) Internationaler Handel: Theorie und Empirie. Heidelberg: Physica Lehrbuch.

ENDNOTES

[1] The Precautionary Principle covers cases where scientific evidence is insufficient, inconclusive or uncertain and preliminary scientific evaluation indicates that that there are reasonable grounds for concern that the potentially dangerous effects on the environment, human, animal or plant health may be inconsistent with the high level of protection chosen by the EU (http://www.gdrc.org/u-gov/precaution-4.html)

[2] On March 23rd 1995, Greenpeace, in cooperation with the Southeast Asian NGO SEARICE, intercepted 100 grams of transgenic rice seeds sent from the Swiss Federal Institute of Technology (ETH) in Switzerland to the International Rice Research Institute (IRRI) in the Philippines for research purposes. In a joint media campaign, they accused the Filipino government of not fulfilling its obligation to hold public consultations before approving the importation of GMOs. This campaign succeeded in convincing the congressional committee on ecology to call for hearings in the House of Representatives on the health and ecological risks of genetically engineered rice.

[3] http://www.un.org/esa/sustdev/documents/agenda21/index.htm