

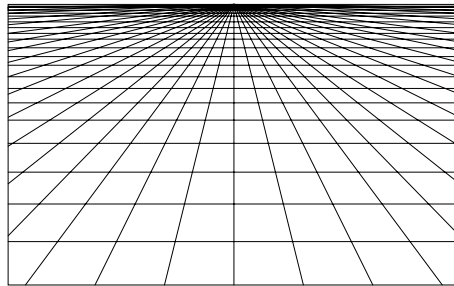


UNIVERSITY OF OSLO

FACULTY OF SOCIAL SCIENCES

TIK

Centre for technology,
innovation and culture
P.O. BOX 1108 Blindern
N-0317 OSLO
Norway
<http://www.tik.uio.no>



ESST

The European Inter-University
Association on Society, Science and
Technology
<http://www.esst.uio.no>

The ESST MA

“ Who gets to count as a Rational Actor in the Courts and Cases of GMOs? ”

Irene Olaussen
University of Oslo/University of Maastricht
ESST/Bridging the Technological Divide
2001 – 2002

Word Count
24.963

Synopsis

Key words: Food Security, Genetically modified organisms, Participatory Technology Assessment, Global Networks

Food security is one of the major challenges facing human development cooperation today. Genetically modified organisms (GMO's) are among key human development agencies, as the United Nations and CGIAR, advocated as potential solution to the problem. This claim has been widely contested from a variety of actors within the global civil society. In this thesis I will elaborate upon the use of participatory technology assessment for deliberation over equitable development and diffusion of GMO's.

According to Van den Daele (Van den Daele, 1997) participatory technology assessments should be more than merely a forum of experts at which the state of knowledge on possible consequences of GMO's are presented and evaluated. Assessments should in addition be arenas for social conflicts, and instruments of social learning within the global network of GMO's stakeholders.

Due to the globally unbalanced development and diffusion of GM technology, and diverging regional power relations and systematic social differences among stakeholders of GMO's these institutions faces some major challenges. My thesis is that, these forums, as socially constructed arenas, cannot be seen as neutral instruments for evaluating GM technology. Consequently, the choice of organisation, representation, steering, guiding narratives and degree of reflexivity among actors towards own engagement influence the generated results of meanings about, and policy suggestions for, the technology. Therefore, we need to address some basic methodological questions in the analysis of these emerging institutions. Questions like: What approaches are suited for different tasks - by issue and by location? Can different approaches be combined and sequenced. How is inclusion and representation addressed, addressed as part of deliberative processes. How can such approaches be linked to other elements of the policy process and decision-making. What approaches are feasible (politically, logistically, financially etc.) in particular settings?

Acknowledgments

First, and foremost, I want to thank all my informants for sharing their views on the topic. A special thanks to my fellow students that have made my year here in Maastricht rich with interesting discussions and social happenings. Professor Louk de la Rive Box and Johanna Ulmanen have been invaluable sources of support during the whole process. All in all, the BTD team has really made me feel at home in the Netherlands.

My supervising professor, Rein de Wilde, has been important in the writing process with critical comments and helpful references to relevant literature. A special thanks to him.

I would also like to thank General Director at ISNAR, Stein W Bie, simply for inspiring me! John Komen, Jose Benjamin Falck-Zepada and Victoria Henson-Apollonio also from ISNAR deserve attention for their contributions during the preparatory phase of the thesis.

Ed Maan, at RAWOO, has been great following up his lecture with links to contact persons and events helpful for my research.

My housemates in Jonkheer Ruysstraat 67 must not be forgotten. Particularly you Silje, for great discussions, all the fun, and for always caring.

As with everything I do, all my friends are there to support me, and they have been in during the process of this thesis, you are all the best! Especially I want to mention Erlend for 'slack' and Marianne for her 'positivity'.

Last, but not least, this thesis would never have been accomplished if it was not for my family letting me indulge in the task. Wherever I am, whatever I do, you are always with me in my heart.

Abbreviations

CGIAR	Consultative Group on International Agricultural Research
EU	European Union
GMO	Genetically Modified Organism
GM technology	Genetic modification technology
GE	Genetic engineering
HDR	Human Development Report
ISNAR	International Service for Agricultural Research
LDC	Less developed country
MNC	Multinational Company
NGO	Non-governmental Organisation
R&D	Research and Development
TNU	the Network University
TRIPS	Trade-Related aspects of Intellectual Property Rights
UN	United Nations
UNDP	United Nations Development Programme
UNU/INTECH	United Nations University/ Institute for New Technologies
WTO	World Trade Organisation

Table of Contents

SYNOPSIS	2
ACKNOWLEDGMENTS	3
ABBREVIATIONS	4
TABLE OF CONTENTS.....	5
1.0 INTRODUCTION.....	7
1.1 FOOD SECURITY AND GENETICALLY MODIFIED ORGANISMS	7
1.2 CONTROVERSY	7
1.3 GLOBALISATION AND NETWORKS	9
1.4 TECHNOLOGY ASSESSMENT	11
1.5 AIMS AND OBJECTIVE	12
1.6 METHOD.....	13
1.7 OUTLINE.....	14
2.0 THEORETICAL FRAMEWORK	15
2.1 CONCEPTUALIZING TECHNOLOGY ASSESSMENT	15
2.1.1 <i>Expert Assessments</i>	16
2.1.2 <i>Corporative Assessments</i>	20
2.1.3 <i>Participatory Assessments</i>	24
2.2 TECHNOLOGY-INDUCED AND PROBLEM-INDUCES APPROACHES	25
2.3 ANALYTICAL TOOLS	27
2.3.1 <i>Organisational Level</i>	28
2.3.2 <i>Technological Level</i>	28
2.3.3 <i>Steering Level</i>	29
2.3.4 <i>Narrative Level</i>	29
2.3.5 <i>Reflexive Level</i>	30
3.0 “SOUTHERNVOICES”	31
3.1 BACKGROUND	31
3.2 ORGANIZATIONAL LEVEL.....	32
3.3 TECHNOLOGICAL LEVEL	33
3.4 STEERING LEVEL	35
3.5 NARRATIVE LEVEL.....	37
3.5.1 <i>Narratives on the Assessment</i>	37
3.5.2 <i>Narratives on GMO`s</i>	40
3.5 REFLEXIVE LEVEL	48
3.6 CONCLUDING REMARKS	49
4.0 “INDIAN CITIZENS TRIAL”	52
4.1 BACKGROUND	52
4.2 ORGANISATIONAL LEVEL	53
4.2 TECHNOLOGICAL LEVEL	55
4.4 STEERING LEVEL	56
4.5 NARRATIVE LEVEL.....	58
4.5.1 <i>Narratives on the Assessment</i>	58
4.5.2 <i>Narratives on GMO`s</i>	61

4.5	REFLEXIVE LEVEL	65
4.7	CONCLUDING REMARKS	67
5.0	CONCLUDING CHAPTER.....	69
5.1	MEANINGS OF GMO`S	69
5.2	PROBLEM-INDUCED APPROACHES.....	70
5.3	“SOUTHERNVOICES” – TRADING CLEAR ANSWERS FOR COMPLEXITY	71
5.4	“CITIZENS TRIAL” – TRADING COMPLEXITY FOR CLEAR ANSWERS	72
5.5	PARTICIAPTORY TECHNOLOGY ASSESSMENTS AND DECISION-MAKING	73
5.6	PARTICIPATORY TECHNOLOGY ASSESSMENTS AS ARENAS FOR SOCIAL LEARNING .	75
5.7	CONCLUSIONS AND SUGGESTIONS FOR FURTHER RESEARCH.....	77
	LITERATURE LIST	79
	APPENDIX	83
	PREPARATORY INFORMANTS	83
	INFORMANTS	83

1.0 Introduction

In this chapter, I will present my aims and objectives. Thereafter, I will give an overview of the methodology, followed by a short outline of the thesis. First, I will introduce my topic, the social problem, the technology and the complicating factors involved in making genetically modified organisms (GMO's) compatible for human development. Specifically I will look at challenges involved in facilitating participatory technology assessments that can come to grip with the global food security issue.

1.1 Food Security and Genetically Modified Organisms

Food security is one of the major challenges facing human development cooperation today. The United Nations Development Programme (UNDP) estimates that there are now 790 million people living with hunger and malnutrition in the world (UNDP, 2001). In many less developed countries (LDCs) changing climate conditions, natural disasters, and population pressure demand an urgent solution to the food security problem. In this context GM technology emerge and seem to offer promising solutions as a tool for increasing food security, placing technology and science at the core of the political development agenda (Ibiden).

The UNDP defines GMO's as artefacts processed through use of modern biotechnology – a group of technologies that enhances our ability to manipulate genetic material. Since the discoveries of the 1960s, the introduction of recombinant DNA molecules into organisms has become more efficient and effective – making it possible to use the power of genetics to engineer the attributes of an organism. More precise techniques have emerged, enabling the genetic modification of most crops and food plants (Ibiden).

1.2 Controversy

GM technology has given rise to societal visions of both utopian and dystopian nature. The debate reaches far beyond the technical consequences of transferring genes and touches on the

fundamental aspects of ethics, economics and politics of development. On the one hand, there are the claimed benefits, new crop varieties to eliminate world hunger by development of crops with higher yields, pest- and drought-resistant properties and superior nutritional characteristics (UNDP, 2001). On the other hand, there is an equally claimed list of risks. Threats to biodiversity and marginalization of the needs of poor, small-scale farmers as the technology may lead to an accumulation of economic and legal power in the hands of multinational companies (MNC's) within the biotechnological industry (Shiva & Moser, 1992).

The sceptics are concerned that the problem of world hunger will be defined as a product of inadequate inputs into technological agriculture. They fear that GMO's are introduced as a 'technological fix' to more complex social problems. This line of argument points out that GMO's are neither universal in their applicability nor neutral in their effects. They reflect the interplay between scientific knowledge, agro-ecological conditions and sociopolitical choices (Bunders, Haverkort & Hiemstra, 1996). Accordingly, technology cannot simply be transferred from research laboratories to an agricultural production zone. A linear process of technological innovation and diffusion is complicated by diverging natural and cultural conditions. GMO's designed for consumers and producers in USA or Europe will not necessarily address the needs, conditions and institutional constraints facing their counterparts in LDC's. Some technologies can be adapted locally. Others essentially need to be invented or reinvented (UNDP, 2001).

The framing of GMO's development often takes place in a part of the world where food insecurity is not generally considered an urgent problem for the public decision-makers. Research and development are concentrated in rich countries. UNDP points out that GMO's today are mainly created in response to market pressure and demands dominated by high-income consumers¹. As a result private research neglects opportunities to develop technology for poor people, even though this means neglecting the potential for improved living conditions for the millions of people living with hunger and malnutrition today. The requirements of the poor are often not accounted for. On the one hand because they do not provide private companies with profitable markets since they lack purchasing power. On the other hand because they cannot make themselves heard as prosperous consumers and

¹ A recent survey of GM field trials shows that only 27.8 per cent of research in the United States and 12.5 per cent in the European Union relates directly to crop yield — considered the most important factor in meeting the food requirements of the developing world (UNU/INTECH, 2002).

lobbyists can in the international regulatory bodies deciding on the political and legal framework of GMO's development (UNDP, 2001).

1.3 Globalisation and Networks

The issue of GMO's and food security is intertwined with economic and regulative globalization that is rapidly unifying world markets. Structures of research and production are being reorganized into networks that span the world. Within a global economy and international politics, networks have gained attention from many scholars. For some, like Manuel Castells (Castells, 1996), new information and knowledge based production and research webs will be the basis of future political and economic orders. Within the economic sector networks are recognized as a particular feature of biotechnological innovation (Chataway, Levidow and Carr, 2000). Inclusion or exclusion from networks becomes an important issue; exclusion is dangerous because knowledge is built up and shared amongst groups of actors, and those outside the 'knowledge circle' risk falling further behind. Networks are also relevant for development cooperation. A number of studies on biotechnological capacity building in developing countries have stressed the need for linkage between different actors, and the need to build networks, especially involvement of private sector is depicted as crucial (Komen & Persley, 1993; Kumar & Siddarthen, 1997).

This tendency to seek and act through networks has also been pointed out as the case for an emerging global civil society² trying to influence policy-making focusing on the ethical, social and environmental effects of GMO's in global markets and among local communities (Warkentin & Mingst, 1999).

These new ideas about research and networks, politics and a global civil society hold out the promise of access to knowledge and expertise that could enable a narrowing of the gap in technological capabilities between richer and poorer countries. These networks may offer possibilities for exchange of knowledge and capabilities between local farmers in LDC's and leaders within biotechnological R&D (Chataway et al, 2001). The inclusion in a global civil

² Lipschutz (lipscutz,1996) argues that there is emerging a global civil society – that is, "a parallell arrangment of political interaction, one that does not take anarchy or self-help as central organising principles but is focused on the self-conscious construction of network,s of knowledge and action, by decentred, local actors, that cross the reified boundaries of space as though they were not there". This notion of a global civil society has been expanded by Warkentin who claims that; "a global civil society can be understood, at the most fundamental level, as a transnationally defined set of ideologically variabl mechanism or channels of opportunity for political involvment" (Warkentin & Mingst, 1999)

society also offers a possibility of spreading information, communicating and mobilising politically from local levels to a global scale. To build such networks are not an easy task though, and the key question remains; who will be included? The assessments that I will be investigating can be interpreted as networks. They are potential gatherings for social learning, information sharing and dialogue between the stakeholders of GMO's. To make GMO's more relevant and efficient for the problems facing food insecure people innovative institutions and managements of agricultural research and diffusion must be generated. Widening circles of collaboration between farmers, grass-root organizations, private sector and governmental agencies are required to carry out adaptive research and policy-making (Javier, 1996).

To sum up, the issues at hand are of a technical as well as political nature. In various ways, then, public debate has linked human development with technological and agricultural trajectories, e.g. how GM crops are designed and diffused to favour particular agricultural practices and power structures.

Along with the innovations within science and technology, social innovations for the assessment and consequent policy making on technology deployment are required. The United Nations warns that without innovative public policies, technology could become a source of exclusion, not a tool for progress. The needs of the poor could remain neglected, new global risks unmanaged. As emphasized by the United Nations;

“Policy, not charity, will determine whether new technologies become a tool for human development everywhere” (UNDP, 2001).

My focus will be on attempts to influence policy-makers and stakeholders to intervene for an equitable development and diffusion of GM technology in the light of the current food security crisis.

The aim of this thesis is not to substantiate any conclusions on whether GMO's are likely to decrease or increase food security. Rather I want to investigate the social negotiations surrounding the development and diffusion of technology. I will particularly look at the facilitation of such negotiations by different approaches to technology assessments.

1.4 Technology Assessment

Public decision-making on technology often rest upon an institutionalised assessment where the potential costs and benefits of a new technology are methodologically evaluated.

Traditionally technology assessment has been the domain of nation states. However, it has been observed that modern societies, of all political guises, find it difficult to cope with the challenges and opportunities posed by the internationalization of science and technology. Classical models of democracy, where the autonomous nation state forms the basis for deliberation and decision, do not seem to be sufficiently equipped to guide the political process regulating the development and diffusion of GMO's, when at the same time, the consequences of nations policies, research collaborations and international trade are increasingly global and the needs and requirements regionally diverse (Bijker, 2001, UNDP, 2001).

The trend of globalization coupled with the call for a stronger compatibility between science and social commitment calls for new and innovative platforms for technology assessment. In the absence of a global democratic community alternative ways of organizing deliberation and generating policy recommendations are looked for. The pivotal questions then surface, how can we carry out societal discussions leading up to the public formulation and subsequent support of GMO's policies? Policies that facilitates international development cooperation based on regional difference in capacities to implement and distribute the costs and benefits of GMO's.

The first challenge is to link the global development and diffusion of GMO's with the local conditions of food insecure communities. Secondly, how can we ensure participation that contributes with knowledge and experience of those living with food insecurity? Are participatory approaches to technology assessments an answer? This type of broad participation can generate valuable end-user knowledge about local conditions. Participatory approaches can simultaneously stimulate social learning on GM technology within local communities. The social groups affected by food insecurity are often marginalized in their own national arenas as well as in the international policy context. Can a coherent representation of these interests take its shape without seriously compromising the myriad of idiosyncrasies in regard to natural as well as cultural needs and demands? Third, how can a new platform be created that will gather the various, also conflicting, actors in the global

GMO's network and at the same time provide some common ground in regard, to steering and framing, for constructive dialogue? As the sociologist Van den Daele has pointed out, assessment should be more than merely a forum of experts at which the state of knowledge on possible consequences of GMO's are presented and evaluated. A technology assessment should, in addition, be an 'arena' in which the social conflicts related to the introduction of a technology can be articulated and discussed in an exemplary manner (Van den Daele, 1997). I will investigate whether the use of participatory technology assessments in my two cases managed to transfer the global debate over GMO's from the public arena to a dialogue of rational argumentation.

1.5 Aims and Objective

My general objective for this thesis is to analyse the use of participatory technology assessments related to the implementation of GMO's in international development cooperation.

I will limit my research to two cases. The first case is the Dutch "Southernvoices" conference. This assessment was a governmental initiative that formed part of a broader public debate on GMO's and food safety. The conferences aimed at evaluating the consequences of GMO's for LDC's and bring this perspective into their national deliberation and subsequent policy making on GMO's. The second case is the "Citizens trial" that took place in a rural part of India. Initiated by a non-governmental organisation (NGO), the trial aimed to let the food insecure themselves assess consequences and decide over the introduction of GMO's, and then, bring their perspective back to the global debate on GMO's.

My choice of these two cases is based on their innovative attempts to come to grip with the complex global causality of GM technology and human development. Different underlying assumptions about proper participation in the deliberation over food security problem are also reflected in the two approaches. They mirror differing views on who are regarded as rationale actors in the courts and cases of GMO's. The Dutch assessment gathers international participants to generate suggestions for international policy-making on GMO's. The Indian case is bringing the global socioeconomic structures to a local southern arena, aiming to generate choices for potential end-users of GMO's. Despite their shared objective of assessing GMO's in the light of food security, their methodology are quite different.

By analysing the differences and similarities in the form and function of the assessments, I aim to investigate the relationship between the way issues are framed, results generated and the approach taken to the assessments. The aim is to investigate how the two cases succeeded in making the voices of the food insecure heard - to clarify thinking about the ways in particular methods and approaches can address specific policy issues. This will highlight the pros and cons from different perspectives on achieving participation of marginalized groups in decision-making on technology. I ask whether participatory approaches to technology assessment can be instrumental in ensuring an equitable development and diffusion of GM technology for human development purposes. I want to illuminate whether there is interplay between assessment approach, framing and steering in these arenas, or whether these arenas are neutral instruments for evaluating technology and social topics.

1.6 Method

As I decided on the thesis topic, I approached some key agencies within the development field. I had meetings with the UNDP Nordic office in Oslo, and ISNAR, in den Haag to get an overview of the problem area, and narrow down my focus to feasible research questions.

Literature and articles have been reviewed in order to get an impression of the debate over GMO's and food security in general, and more specifically the role of technology assessments. As I started operationalizing my aims and objective, I decided to gather empirical material from two case studies. I wanted to show how divergent both the form and function of participatory approaches to technology assessment can be. The choice of cases studies, hence, illuminates these initiatives social innovation trying to come to grip with the complex global nature of the GMO's issue.

I will compare these two events using a set of analytical tools inspired from a network model. The use of a network model will help evaluate the assessments performance in a complex, global arena. I want to see whether we can draw some conclusions from the cases differences and similarities the methodology of constructing and operating such arenas for social argumentation.

For the case studies information through literature, correspondence, policy papers and interviews with involved parties has been gathered. I have been looking for factors that could

explain them by identifying possible explicit and implicit assumptions concerning GMO's and their specific choice of approaches to technology assessment. The interviews are based on key informants among the organisers of the initiatives. I have also conducted semi-structures interviews with participants of the assessments. I have reviewed transcripts from the two initiatives carefully.

1.7 Outline

After having presented the topic and the objective, aims and method of the thesis in this chapter, I will introduce my theoretical framework in chapter two. I will conceptualize technology assessment and discuss different approaches and their ability to tackle the challenges of the food security issue. Next, I will introduce my analytical tools, and the criteria for the following analysis of my two cases.

The “Southernvoices” case will be presented in chapter three, followed by the “Citizens trial” in chapter four. The concluding chapter will sum up my findings according to their importance for the earlier presented theoretical framework, and in the light of my initial mains and objectives. This will be followed by the bibliography and the appendix.

2.0 Theoretical Framework

2.1 Conceptualizing Technology Assessment

In recent years the assessment of risk and benefits stemming from technological development has gained a lot of attention. One of the reasons pointed out is the increasing awareness of the negative side effects of technological growth, such as damages to the environment, leakages from nuclear facilities and the recent incident of Mad Cow Disease. The emerging gene-technology has also illuminated the ethical aspect of technological development as well as the socio-economic distribution of potential risks and benefits that follows this technological trajectory. But how is this emerging awareness reflected in public debate and policy-making, and what practical implications has it had? Along with the awareness of social and environmental risks involved in technology deployment, and the following concern for the future development, political measures have been taken to come to grip with the problem. This is reflected in the political decision-making, in new laws and regulations, also internationally, and particularly in the search for adequate institutional solutions for the continual assessment of technology (Eriksen&Olsen, 1999).

Before I introduce my case studies, I will discuss the concept of technological assessment. The two Norwegian political scientists Eriksen and Olsen offer a nice overview (Ibiden). This part will form the conceptual framework of my thesis.

The scholars consider the variations of technological assessment institutions recently emerging, their basic structure, what kind of logic do they adhere to, what kind of problems are they suited, and to what degree do different institutionalised practices comply to normative standards? They further question the potential and validity of specific conception of technology assessment as these are reflected in actual politics. Are the institutions and practical arrangements chosen ensuring adequate assessments, and if not, on what counts do they fail?

Technology assessment has mainly been institutionalised following three distinct categories, with respective views on what legitimates technology assessments. The outcome is three kinds of institutions, which represents different approaches to technology assessment.

Ideal typically these are:

- 1. Expert arrangements**
- 2. Corporative or interest-representative arrangements**
- 3. Participatory arrangements**

These convey differing conceptions of risk and benefits and the issues involved in technology assessment. My presentation will specifically consider these institutions in regard to their potential for international development cooperation.

2.1.1 Expert Assessments

Traditionally the notion of technological evaluation has been connected to expert competence, where robust solutions need expert knowledge based on verified data. The use of expert advice rests on an understanding of the issues at hand as being primarily of an empirical nature. Evaluating GMO's, then, is basically understood as a cognitive undertaking, and oriented towards determining the facts of the matter. The purpose of such an assessment is the solution to given problems, understood as establishing an objective and valid description of reality, clarifying mean-ends relations and technicalities. The goal is to assess the technology and to determine the political actions that might be necessary to cope with that technology. The tradition of basing political decisions on expert advice seems to rely upon the assumption that technological risks and benefits may be measured through scientifically estimating the level of probability for a consequence of technology deployment to occur. Hence, the political task is simply to consider whether that level is acceptable, in practice, whether or not to go on with the undertaking. Defined in such a way, assessing technologies can be delegated entirely to scientific expertise. As such, the rationale for expertise-based assessment lies precisely in that it is a substitute for democracy: it relates to questions whose nature makes them the domain of technocrats, thus, unsuited for democratic deliberation.

Delegating the authority to scientific experts provides the basic facts needed for objective political decisions on complex issues. Questions can then be decided without deliberative consensus arrangements. In so, referring to an authority capable of defining what is at stake or what the facts are feels reassuring and contributes to the notion of rational and responsible

politicians. That escapes having to deliberate and reach consensus on the intriguing normative basis they legitimate their decisions on. Hence, ensuring public trust is an aim built into the institution of expert assessments.

The problem is that as far as assessments are not of a purely technical nature, when there is a lack of consensus around the issues at stake and these facts, the problems does away with other considerations that might be needed. One thus ends up with reductionism of complex and important socio-political problems.

Expert Assessments and GMO's for LDC's

Inherent in the debate over GMO's potential for development are also structural, non-technical factors such as the global regulatory system and the patent regime. While the patenting of GMO's can be justified in a rich, industrialised society as a mean to give incentives and payback for this resource intensive technology, the patenting may obstruct access to crucial breeding methods and products for small-scale farmers lacking purchasing power in LDC's (UNDP, 2001)

Such major aspects of the issues, as the socioeconomic influence of the patent regime, fall out of sight, are neglected, under communicated or instrumentalised because problems are only addressed from the point of view of objective science. Normative dilemmas or questions about distribution of costs and benefits always involve several sides, and cannot be solved in a black and white fashion. Using science as a relief device for political deliberations may obscure other and broader concerns of for example, a political or economic kind, as the authority of experts and scientific discourse conceals or rules out other concerns. When expert knowledge is the sole premise for political decisions, we are facing the problem of technocracy: that is, the normative aspects of decision-making are excluded and politics is reduced to the administration of technical decisions.

Epistemological uncertainty has threatened the status of expertise based risk assessment. Developments within the scientific community itself, such as the continued differentiation of science into different sub-disciplines and the increasing awareness of the uncertainties characterising risk issues, have made scientific consensus, even on the purely factual aspect of an issue, all the more fragile, and on important areas, quite unlikely. The controversy

surrounding GM Maize contaminating natural maize crops in Mexico may illustrate this (see Box 1).

Science is to an increasing degree incapable of establishing the requested consensus concerning the facts of the matter, and is therefore less likely to establish an objective basis for political decision-making. Facts rarely speak for themselves, they are infused with values and liable to interpretation and reinterpretation (Latour, 1986). Facts are not always neutral, as they may hide certain interests, suit certain motives or reflect certain normative ways of framing the issue³. Different interest groups can choose expertise in a strategic manner. In this way science no longer contribute to the reduction of conflict, but rather the multiplication of dissent and conflict on important political issues. Hence, science as a legitimate basis for political decisions becomes distrusted in the public eye. In such situations, it becomes more difficult to leave questions regarding technology solely to the problem-solving capacity of expertise. When the division between science and politics becomes blurred, a broader set of premises for decision-making is called for.

The deconstruction of science and reactions to the scientification of risk and benefits questions have shown that the nature of the issues involved are more diverse, and comprises not only technical, but also ethical and social aspects. These aspects of assessment pose challenges that cannot be left to the problem-solving capacities of experts alone, because their competence is structurally limited. The instrumental rationality of technical expertise expresses result-oriented mode of action, where values and goals are taken for granted. But problem raising normative questions are of a different kind, and they require participation of affected social groups in order to reach valid solutions.

³ The controversy surrounding GMO's can be framed around different dimensions, where different criteria are evaluated as appropriate in different context, this stems from the complexity of the GMO's debate. By using different theoretical frameworks in the analysis of a particular problem, researchers might get different results Eike has described this phenomenon through the differences between micro and macro biology in answering whether GMO's are to be considered as 'natural' or 'unnatural': A micro-biologist implements a theoretical framework that focuses on the inner workings of the cell and processes within the organism, hence, leading the researcher to conclude that there are only minor differences in the genetic composition of a GMO compared to a 'natural' organism. Conversely, a macro-biologist will focus on the interactions on the ecological level, hence, the researcher might see a trait in a novel organism that, when introduced into the environment, can disturb complex ecological interactions. The negotiation over scientific 'facts' is only one of the multiple dimensions where researchers choose a theoretical framework. The more inclusive the assessment, the more complex the result (Eike, 2000).

“The GM Maize Controversy”

The Mexican government has confirmed earlier reports that transgenic maize is growing within the country's borders and has apparently contaminated wild varieties in the Mexican states of Oaxaca and Puebla.

The announcement was the latest twist in a heated scientific and political row over whether or not GM maize is contaminating wild strains in Mexico, the genetic home of maize. The controversy erupted last November when David Quist and Ignacio Chapela from Berkley University published a study in *Nature* that showed that DNA from GM maize had been found in wild varieties. The response was immediate; *“Transgenic corn may be being grown illegally in Mexico, but to claim that these transgenes have pervaded the entire native maize genome is unfounded,”* say Nick Kaplinsky and colleagues, also from Berkley. They add: *“It is important for information about genetically modified organisms to be reliable and accurate, as important policy decisions are at stake.”* An editorial in *Transgenic Research* says that; *“the data presented in the published article are mere artefacts resulting from poor experimental design and practices (...) no credible scientific evidence is presented in the paper to support claims made by the authors”*. The findings have since been widely used by environmental groups and others as confirming the legitimacy of their concern about the potential effects of transgenic crops on plant biodiversity, considered essential for global food security. As this statement in *The Lancet* illustrate; *“All policymakers must be vigilant to the possibility of research data being manipulated by corporate bodies and of scientific colleagues being seduced by the material charms of industry. Trust is no defence against an aggressively deceptive corporate sector.”*

Both sides of the argument are hoping to influence imminent decisions about the regulation of transgenic crops. Doubts about the scientific validity of the research led *Nature* to withdraw its support for the study, concluding that there was insufficient evidence to justify its original publication of the paper. In a statement, the journal said that; *“in the light of the criticisms and advice from referees, Nature has concluded that the evidence available is not sufficient to justify its publication of the original paper.”* This announcement was made right before the meeting on the convention on biodiversity scheduled to review the Cartagena protocol. A statement from scientists organised through the Agbio network was also released. The statement affirms that *“relentless double-checking and independent third party evaluations are the cornerstones of the scientific process,”* and further, *“This is in fact how science corrects mistakes and ever more closely approximates truth and understanding. The real question is one of academic integrity. Since the dogged and relentless pursuit of truth is the ultimate goal of science, should Quist and Chapela have been allowed to publish such obviously flawed findings?”*. An answer was later published in the *American Journal of Public Health*, written by three American scientists; *“...the 'sound science' movement is not an indigenous effort from within the profession to improve the quality of scientific discourse, but reflects sophisticated public relations campaigns controlled by industry executives and lawyers whose aim is to manipulate the standards of scientific proof to serve the corporate interests of their clients.”*

The New Mexican evidence, however, appears to support Quist and Chapela's findings, and gives weight to environmentalists' fears. Some experts say that the debate on the Mexico findings is, in any case, somewhat beside the point. Because maize is wind-pollinated and varieties cross readily, almost everyone agrees that genes from GM maize will cross to local varieties if they are grown close together. What really matters is the ecological impact of such gene flow. Local maize varieties are not very stable, and farmers have long crossbred them with other varieties. *“Gene flow is a constant,”* says Tim Reeves, director of the CGIAR International Maize and Wheat Improvement Centre in Mexico. *“The real question is whether it makes any difference if one of the genes that flow in is a transgene.”* Scientists are divided on that question. Some argue that the transgenes will reduce genetic diversity, whereas others contend that they could either have a neutral effect or actually enhance diversity.

Sources: SciDev, RAFI

In this case, then, interest representation may be an adequate answer. To a considerable degree, representatives of social interest organisations have in fact been included in technology assessment. Such bodies, where parties representing different interests or viewpoints come together and negotiate decisions through compromises, approximate the second ideal type in the conceptual framework of technology assessment, namely corporative arrangements.

2.1.2 Corporative Assessments

When diverse interests and social conflicts over distribution are involved in the assessment of technology, representation of affected stakeholders is appropriate. There is a need to know which interests and preferences are at stake. Consequently, corporative representation is required, in addition to the problem solving capacity of expertise.

A corporative representation involves the negotiation over affected interests, whereby conflicts are settled through compromises resulting from the aggregation of preferences and the give and take of opposing parties. More theoretically speaking, this interaction may be explained through the concept of strategic action, where utilitarianism leads to bargaining for optimal results. The sociologist Jon Elster explains this phenomenon:

"To bargain is to engage in communication for the purpose of forcing or inducing the opponents to accept one's claim. To achieve this end, bargainers rely on threats and promises that will have to be executed outside the assembly itself" (Elster, 1992).

The corporative model of assessment presupposes given preferences. Interests are considered as both stable and opposing. Rather than a harmony model, where the discovering of common values and interests, and consensus is the objective, this model is directed towards reaching solutions that parties with conflicting interests over outcome can agree upon given the actual allocation of resources. Corporative arrangements are thus well suited for questions where one can find points of balance, equilibrium, compromises and trade-offs. This requires that the issue involved can be measured by the same standards. It further implies that the stakeholders do not have strong preferences connected to a particular outcome, but are willing to give and take.

Corporative Assessments and GMO's for LDC's

Bargaining may compromise the situation of developing countries. The urgency of food insecurity, together with the unbalanced power relation between the different actors in the negotiation over GMO's future, may force LDC's to accept a deal that is not optimal. Many fear that the imbalance in negotiating power can make farmers dependent on industry for their survival (UNDP, 2001). Often LDC's lacks negotiating power due to their dependence on export and import relations with industrialized countries. Or, in a lobby scenario, the industrial actors in a country with strong negotiating power may have a grip on the countries delegation to the negotiations. Again, due to lack of purchasing power, poor farmers can fail to influence industry who's main objective is to maximize profit on their R&D investments (Ibiden).

Corporative assessment preconditions that stakeholders are organized as social groups. The constructive simplification of LDC's as one homogeneous interest group may force them into accepting a compromise that neglects the myriad of idiosyncrasies they constitute. When assessing potential costs and benefits of GMO's the nation's different attitudes towards risks and the widely differentiated capacities to manage the technology should be considered.

The global character of the GMO's debate is partly a consequence of the tools offered by modern communication technology. Communication about the perceived risks and benefits of GMO's is globally accessible on the worldwide web. Activists are likewise organized globally. When highly mobilized and vociferous communities promote their views and values worldwide, the local roots of their preferences can end up having global reach, influencing communities that may face very different problems, and capacities to implement GMO's (Ibiden). The problem of corporative representation is also a matter of resources and not only economic resources. The power to influence is not normally equitable distributed.

Within the context of a national GMO's assessment, the organizing of social groups and their accessibility to corporate channels is not necessarily feasible. This may not be problematic in highly developed, democratic societies. It is not self-evident in many LDC's

where corruption and/or strict sociopolitical marginalization of i.e. small-scale farmers, often women, and poor groups are the realities. To promote a corporative approach to GMO's assessment may imply overlooking the differences in political culture existing between regions.

The corporative model may be well adjusted to situations of distributions of goods and burdens, such as salary negotiations. In the case of GMO's, where it is difficult to perceive how a compromise on the acceptability level of risk can be established, at least in a political viable manner, it may be unsuited. In this matter it is often the case of all or nothing, where bargaining is out of the questions, as the values affected are too strong. (i.e. religion). This logic of compromises cannot in an adequate way handle normative matters involving principles, or matters in which the interests involved are difficult to identify, delimit or represent, as with future generations, or sustainable agriculture. If such values are put up against i.e. the basal need of food, then the compromise raises ethical question of unjust coercion⁴.

Technological developments are characterised by increasing speed of development coupled with an increasing uncertainty of consequences. What is impossible today might be possible tomorrow. The risks and benefits involved are often unknown, and affected parties might, in principle, be anyone, including the yet unborn. This is also the case for GMO's release in the nature, the consequences of releasing these products into nature are near impossible to determine in advance, and there may be long term effects that no-one can observe adequately. Thus, it becomes increasingly difficult to delineate the interests at stake and the potential affected parties. At the same time, the unacceptable *status quo* situation puts a normative pressure on implementing every mean possible to eradicate food insecurity. This makes up the dilemma between the existing risks of not acting, versus the potential risks of implementing GMO's.

⁴ The strategy of many NGO's in the GMO's debate can be seen in light of this feature of Corporative assessments. The participation has in general taken form of outside protest, rather than inside participation. In that way they will not have to compromise their basic principles. This again, may have lead to an increased distrust among civil society groups, with regard to the methods and the conclusions of the assessments processes.

The complexity of the GMO's issue challenges the traditional stakeholder division and the established decision-making procedures. The complexity of the considerations involved, and the lack of clear-cut solutions, calls for more permanent and qualified arenas for deliberation.

In democratic systems public opinions of the trade-offs of technology are often key determinants of whether a technology is promoted or prohibited. Public preferences matters, since it is ultimately individuals and communities that stand to gain from change or bear its costs. Especially in Europe, the linkage between public opinion, governance and industrial interests has been highlighted as problematic in recent years. What has been described as a crisis of legitimacy for science and governance is coupled with the need for more active public involvement in assessment and decision making of controversial technologies. This debate is related to the issue of public distrust. This distrust stem from the recent crisis in the food industry. In these cases, lack of transparency about what was known and delays in policy response damaged the reputation of policy makers. European Union (EU), among other regulatory bodies, has pointed to the opening up of technology assessment processes as essential to restore trust in science and governance. To strengthen the democratic image participatory approaches have been promoted. As explained in a white paper on governance;

“The principles of access and accountability demand public debate, knowledge sharing and scrutiny of policy makers and experts at the grass-root level. Citizens juries, consensus conferences, participatory foresight are among the mechanisms to be implemented.”
(Liberatore, 2001).

A broader assessment practise has also been promoted by development agencies, for the UNDP such undertakings may help;

“...rectify the imbalance of voices and the influence of needs” (UNDP, 2001).

These claims have lead to the institutionalisation of a third approach to technology assessment, namely participatory approaches.

2.1.3 Participatory Assessments

The main argument for bringing lay participation into technology assessment is to strengthen the democratic element within such assessments. Through democratising technological development, its compatibility to social commitment can be strengthened.

The number of criteria for assessing technology increase as more people are given due hearing and the more aspects of the technology's interrelation with the social context are considered. This is essential given the complexity of the problems. Thus, these arrangements are an important corrective to the predominantly scientist or expert-based arrangements discussed so far. Participatory arrangements broaden the input and basis for decision compared to a corporate approach. Increasing lay participation in technology assessments can enhance the legitimacy of decision-making, and bring valuable end-user knowledge into the early phases of the development process. Participatory arrangements may stimulate social learning about technology. Citizens' juries and consensus conferences can, in fact, lift the burden of decision-making and become a procedure for legitimising and speeding up decisions that would otherwise be caught in a deadlock of hearings and negotiations between multitudes of involved parties.

However, we should not see participatory approaches as a 'social fix' to technological controversies. There is what has been called a possible 'post-modern' critique towards the use of participatory arrangements. As the lack of trust in politicians and experts stemming from the modernity is withering, there is a danger involved in unreserved faith in the lay people, thus same mistake only reversed fashion. Participatory approaches can be criticized for turning the back against science and expertise and ordinary politics, when there are reasons for leaving certain questions to expertise, because of the technicalities involved, and for creating space for bargaining between interests groups when there are no common standards available for reaching agreements (de Wilde, 1997).

Participation in itself does not secure sound decisions. It should be considered a mean for larger objectives, and not the end goal itself. The decision reached may be based upon wrong questions, falsely grounded interests and/or biased discussions. Liberating technology assessment from any other criteria for decision then the criteria of lay participation contributes to a situation where any decision is as good as any other as long as it got popular support. Participatory approaches may also become a means of legitimising certain ways of framing

the issues involved, thus reducing rather than increasing the range of issues considered. The organisers of an assessment can, through choice of issue, recruitment of lay people and experts, and through organising the proceedings, steer the process in a particular direction. Such closure of the debate through the organisers framing of the discussions may lead to reducing the participants' input in such a way that they merely serve as legitimisation devices for certain options already made. How then, can we address complex social problems through a technology assessment?

2.2 Technology-induced and Problem-induces approaches

In their conceptual framework, Eriksen and Olsen focus on the political rationale underlying the approaches to technology assessment. As political scientists, they are concerned with dimensions like the assessments representation, normative foundation and relation to political regimes. These are important dimension to understand the institutionalisation of these arrangements, and how they generate decision-making on technology. What the framework does not explicitly consider is the object of the assessments. That is, what is being evaluated, and how issues up for assessment are framed. By means of insights from the STS tradition, I will add this dimension to my analysis.

The sociologist, Van den Daele, has been engaged with the approach to the object under scrutiny, and the consequent framing of assessments (van den Daele, 1997). He distinguishes between two approaches to technology assessments.

Van den Daele first describes what he calls a '*technology-induced*' approach. In a technology-induced assessment, the starting point is the emerging technological development, and the analysis focuses on the possible consequences of this development and political actions that might be necessary to cope with those consequences. Although not deterministic, this type of assessment, due to its technical character, is often found in expert advisory arrangements.

Participatory approaches, on the other hand, are often what Van den Daele describes as '*problem-induced*'. A problem-induced approach is contrasted from the earlier described technology-induced approach since such assessment does not address the consequences of a specific technology. However, a problem-induced approach is not a substitute for technology-induced approaches. The latter is always implied in the former and a precondition for it. A problem-induced approach examines which social problems the technology is supposed to help solve. It then compares the various ways of tackling the problem. In the case of GMO's, the starting point would be food insecurity. A comparison would then be made of the solutions offered on the one hand by industrial, intensive farming, on the other organic farming. A comparison of this kind, however, should not be restricted to strategies for i.e. increased yield. It would have to take into account the overall production system in which these strategies are embedded. The decisive question would then be whether we really need GMO's and what kind of farming is socially desirable and ecologically acceptable. Problem-induced assessments allow the discussion of broad and fundamental political issues, thereby enhancing the problem-solving capacity. But the trade-off, as Van den Daele points out, is that the problems of a technology assessment are, in fact, inflated to problems of political planning in general: which objectives should be pursued in society? How can they be achieved? What are the opportunities and what is the proper role for state control? Van den Daele questions whether scenarios of desirable futures should really be deliberated within technology assessment processes (Ibiden).

The inherent complexity and the multiple opinions can distract the participants focus, and obstruct substantial debate. A problem-induced approach can also make it hard to reach any conclusive results since the complexity causes an inherent degree of uncertainty leads to relativism. But, the pendulum may swing in the opposite direction. Participatory arrangements carry with them a propensity to simplify the issues. Thereby oversimplify complex problem presenting them in an either or fashion, to enhance the ability to reach conclusions.

To conclude, participation without reflection is meaningless. There can be no promise of a '*social fix*'. Participatory arrangements may be suited for democratising decision-making on technology. These arrangements may offer the voices of LDC's a chance for to be heard in the future development of GMO's, but there are also obstacles. Furthermore, issues of organisation, representation, objectives, legitimacy, and steering need to be considered and implemented carefully to secure qualitative results. These criteria will be of importance for

me as I start out the investigation of two cases of participatory technology assessment. First I will present the analytical tools that I will implement to operationalize the criteria and clarify the analysis.

2.3 Analytical Tools

My main objective in analysing the two cases of participatory technology assessments is to investigate whether these two initiatives managed to facilitate networks that could spawn a connection between the global stakeholders of GMO's, and the local conditions of food insecure communities.

To illuminate the strengths and weaknesses of my two cases with regard to this objective, I will use a model for network analysis. This model is inspired by the work of Arquilla and Ronfeldt. In their article, "*Networks, Netwars and the Fight for the Future*" (Arquilla&Ronfeldt, 2001), they suggests a model for the analysis of a networks success and sustainability. The authors identify five levels of practise that differentiates networks, and makes them more or less efficient in reaching their aims, makes them fit for a 'netwar' in the authors jargon. I will implement this model as an analytical tool as I present my two case studies. However, it is important to note that I am not analysing them as organised stable networks in the sense that Arquilla and Ronfeldt promotes the model. For this, the cases are both too limited in time. My focus is primarily on the events as approaches to GMO's assessment, and their generated results towards policy and opinion shaping. However, how the organisation benefits from already existing networks, facilitation of dialogue, sharing of existing and generation of new knowledge are important criteria in analysis of networks. These criteria are also important for the following analysis of my cases.

Since my cases are time specific events, the personal level, proposed by Arquilla and Ronfeldt, is difficult to assess. Instead of using this level of analysis, I will focus on a reflexive level. Arquilla and Ronfeldt do not mention this dimension. I believe that such a level of analysis, focusing on the generated results and the communication of those towards the wider audience, and networks within the global debate on GMO's could be constructive.

The reflexive level will investigate the actors' evaluation of the assessments. It will also investigate the initiatives role in the wider global debate on GMO's and food security.

My investigation will start out by identifying the objectives of the two initiatives, and the means of reaching these. The five levels of practise that I will be looking at are;

- Organisational Level – its organisational design
- Technological Level – the information system in use
- Steering Level – the collaborative strategies and methods
- Narrative Level – the story being told
- Reflexive Level – results and communication with external actors

According to Arquilla and Ronfeldt, the strength of a network depends on its functioning well across all levels. The strongest networks will be those in which the organisational design is sustained by a winning story and a well-defined doctrine, and in which all this is layered atop advanced communications system. Each level, and the overall design, may benefit from redundancy and diversity. Each level's characteristics are likely to affect those of the other levels⁵.

2.3.1 Organisational Level

At this, the top level the analysis is revolving around questions like who are the initiators and organisers of the event, what does the structure of their relation to the GMO's debate look like? Who are the participants, and why are they involved? Assessment at this level should illuminate the degree of autonomy or organisation among the participants and connections to other events and networks.

2.3.2 Technological Level

The authors identify the need for a dispersed and highly/well-functioning communication system as a crucial criterion for the success of social movements. This level identifies the pattern of, and capacity for, information and communication flows within an organisational

⁵ The description and its five levels should be seen as an ideal model (Weberian), as an analytical tool, and not as a 'recipe' for a successful network.

network. What technologies support them? How is modern ICT implemented? How well do they suit the organisational design, as well as the narrative and steering level? And what is the role of the internet on the reflexive level? The internet is becoming an increasingly important political tool (Warkentin & Mingst, 1999). Specifically, the web facilitates networked socio-political relationships in important new ways, it (potentially) increases social group's organisational effectiveness and political significance, provides information and it helps foster more broadly participatory (transnational) political processes. Given the inherent nature of the internet, actors are able to do this with unprecedented speed and on a global scale, and to a low cost.

2.3.3 Steering Level

This level of analysis will focus on the steering of the discussions, and how they relate to facts, knowledge and information as sources for justification, and as a common ground for discourses. I will look at the role of the moderators as balanced third parties, how do they weigh the representativity of the participants, who's arguments count? I will be interested in how the assessment tackles the potential complexity problem of a problem-induced approach, is the steering structured so that objectives can be fulfilled. To what degree are the participants influential in setting the agenda and framing the issues at stake? What room is given confrontations and dissent? This level of analysis can reveal whether biases in the structures of the discussions, or restriction of participants' ability to influence may have had significant effects on the outcomes of the assessment.

2.3.4 Narrative Level

The integrative force of a network lies in the narratives or stories that people tell. Narratives provide a grounded expression of people's experiences, interests and values. First of all, stories express a sense of identity and belonging - of who "we" are, why we have come together, and what makes us different from "them", perspective making and links to other networks may be examples. Second, stories communicate a sense of cause, purpose and mission. They express aims and methods as well as cultural dispositions - what "we" believe in, what we mean to do, and how. This is ways of framing the issues at stake. The right story can thus connect the actors in an otherwise loose network design, and it can help create bridges across different networks. The right story can also generate a perception that a

movement has a winning momentum that time is on its side. I will divide this level into two aspects of the event. First, I will focus on the narratives surrounding the assessment. Secondly, I will focus on narratives about GMO's.

2.3.5 Reflexive Level

Such a level will form space for evaluative reflections on the significance of the cases in the aftermath of the event themselves. It can further shed light on whether there were any networking activities generated as a result from these events. To sum up, what objectives did the assessment fulfil? Did the events influence extend the arena of the assessments? I will look for information flow, media attention, learning, mobilisation and reactions in other forums for GMO's debate.

3.0 “Southernvoices”

- Rubber Stamp Participation or meaningful Social Innovation?-

3.1 Background

In June 2001, an independent Dutch Commission on Biotechnology and Food Safety, popularly known as the Terlouw Commission, set out to answer the question “Under what circumstances are GMO’s acceptable to consumers?” After the Commission’s findings had been presented and discussed in Parliament, policy recommendations were to be made to form the base for the Dutch position in the EU and for subsequently legislation. The work of the Commission attracted heavy critique from participating NGOs. These groups called for an inclusion of LDC’s interests in the debate, and they also criticized the Commission for having a pro-biotech bias. This disagreement led to more than outspoken dissent. Fifteen NGO’s decided to leave the debate, of them mainly environmental and social rights groups. Later on, the Dutch minister of development cooperation, in a cabinet meeting demanded that the interests of LDC’s should be incorporated in the debate. The complex global character of the food chain and the intensity of trade in agricultural products with developing countries were presented as the reasons. This position implied that the issue of introducing GM food crops was considered of critical importance to policy makers, researchers, civil society organizations and consumers, throughout the South. For this reason, the Commission attempted to get an impression of views held in the South on GM crops. “Southernvoices”: an online debate was set up at the request of the Terlouw Commission. The goal was to access the opinions of policymakers, scientists, civil society organizations and consumers from developing countries. The conference was set up to create a structure that would enable an accessible, open discussion where the participants were invited to 'set the agenda' under the guidance of four moderators from the biotech field. The result of the conference was later compiled into a written report containing policy recommendations for the Dutch government.

3.2 Organizational Level

The Commission had tried to initiate a broad public debate in the Netherlands, not only to depend on pressure groups. This was also the aim of the “Southernvoices” conference. As explained by my informant with the Commission;

“what was known in the Netherlands about GMO’s and LDC’s, was pretty much defined by stakeholder groups. That often implied a simplified depiction of the GMO’s debate, industry giving a rosy picture, while pressure groups being overall negative”. (Informant 2)

It was considered of importance for the Commission that the debate should reflect more than the, often, antagonistic dispute between mainly negative NGO’s and progressive industrial interests. Such a scenario risked reducing the potentially diverging southern representation by letting the interests of centrally commanded interest groups themselves prime. The key objectives were thus to involve an international representation that focused on development cooperation. It was further important that the conference could depict the complexity of the issues at stake.

As the process of operationalising these objectives began, the Commission approached the Network University (TNU). TNU forms part of the University of Amsterdam. The university operates virtually, based on modern information technology. These activities include online education, debates and networking. TNU’s activities centre around six main areas of expertise. These are what they consider key pressing issues facing today’s society, whereof modern biotechnology is one of them⁶. TNU has an explicit focus on LDC’s, and the goal is to stimulate social transformation. TNU targets a heterogeneous group of professional, governmental and NGO’s, student and researchers. The aim is to create an interdisciplinary platform for the exchange of knowledge and information.

Since 2000, TNU became responsible for Biotechnology and Development Monitor (hereafter to be referred to as the *Monitor*), a quartile magazine with 5000 subscribers around the world, funded, and edited in close cooperation with the Dutch Ministry of Foreign Affairs. The *Monitor* focuses its articles describing and analysing trends on biotechnological

⁶ The other five areas are i.e. ICT, Conflict Resolution, International Politics and Networked Economy and New Politics.

development that may impact developing countries. The primary target group of the *Monitor* consists of policy makers in the public sector, scientists, industrial organizations, farmers' organizations, consumers' organizations, non-governmental organizations, university students in developing and industrialized countries, and media.

For the Commission the mobilization of the TNU network and access to the *Monitors* extensive subscriber list was considered an effective way to reach their target group.

The "Southernvoices" conference attracted a total of 529 participants from 68 countries, yet only 83 participated actively. The conference was conducted in English. The biggest single country was the Netherlands, followed by India and USA. Nearly half of the participants originated from LDC's. Most of the participants at the "Southernvoices" were part of the Monitor or the TNU network. The main group was NGO's, the other large group were academics, and then only a few farmers and policy makers.

The organizers consider the number of participants a success compared to the resources they had available. Part of this success TNU ascribed to the choice of technological level.

3.3 Technological Level

The "Southernvoices" conference relied on the internet as the meeting place. To gather 529 international participants at one location for a ten days conference would have far extended the granted budget from the government. It would further have been difficult to have the participants take two weeks off their agenda to participate. Through online participation, people could combine the event with regular work.

The use of modern communication technology may be problematic when the target group consists of people from developing countries. The access to internet is not evenly distributed among the worlds population. The technological divide is particularly visible between developing and developed countries. Within the developing world, especially the African countries have low general access to internet (UNDP, 2001). The organizers did not overlook

this point. They realized that to reach everybody would be impossible. Despite this element of discrimination, the targeted group to a certain degree levelled out the imbalanced distribution of access. Academics and professionals have a higher level of access than the general public, also in developing countries (Ibiden).

The technological level may have been a reason for the low participation of farmers from developing countries. Nevertheless, with the recognition of what the dividing lines are, it may still be justified to use technology to achieve something that you otherwise would not have been able to do. In the end, the technological gap due to different access to internet did not seem to unbalance the discussion. Throughout the debate, there were similar numbers of contributions from Africa, North and South America.

The TNU, as a virtual university, had the experience needed to organize an online discussion. The TNU/*Monitor* network, the main participant group, could easily be mobilized through a web page. The network was prior to the event accustomed to using the Internet as a source of information and communication. Organizing the discussions within four discussion rooms helped keeping the structure of the conference user friendly. Participants also knew from the beginning that the discussions were focused on generating policy suggestions; this gave direction for the debate and ensured a structural flow of communication. An advantage with the use of the internet was that it allowed the participants to benefit from access also to other sources of information throughout the conference. The organizers and the moderators had posted links to web sites addressing a variety of the issues discussed. They were also able to stimulate the participants through distributing daily summaries and questions for next day's discussion through e-mail for the participants, allowing everybody to keep track of the debate. The participants themselves also had the possibility to distribute cases on their own. The internet could also be used as a library, thus, when references to terms, agreements or empirical material that were unfamiliar to the participants surfaced, they could immediately find references.

3.4 Steering Level

The conference was set up in two rounds, the first round lasting two days. In each round, four international moderators from the biotechnological field were in charge of each their discussion room. The idea behind the tasks of the moderators were that they should take the debate through the different phases of development, making sure that everyone's knowledge and insight around is inside and participating in developing the ideas further. The key for the moderators was to ensure that the good ideas, even if its just germs of good ideas, were the ones coming to the forth and being developed by the rest of the group. In this sense, the "Southernvoices" conference was not a consensus conference where the participants were to reach an agreement through deliberation over the issues. Nor was the conference to conclude with voting over proposals. Instead it was seen as an arena for "idea mining", where the variety of voices could come together and discuss;

"It was never about choosing a position, one or the other, but it was about sketching the terrain, the contours of the arguments". (Informant 4)

The first round was a brainstorming session where the participants were given the autonomy to contribute with issues and ideas for what they considered should form the in depth agenda. In each discussion room, the moderators had posted a brief introduction to the issue at stake. A link to an "information board" presented the participants with relevant case studies and hyperlinks to NGO's home area, information pages and articles. The four original rooms were constructed around four dichotomies. The use of dichotomies was intended to both frame and fuel the debate;

"Because with this open agenda setting, it couldn't really start from nowhere, we had to find dichotomies that were controversial enough to get people thinking and to really get the opinions out there, so that one generates a lot of discussion and a lot of ideas out of that". (Informant 4)

These dichotomies were: "Food safety vs. Food security", "GMO's vs. Organic", "Private vs. Public" and "Local vs. Global". The moderators then formed a topic map with the emerging and overlapping issues contributed by the participants. These topic maps formed the basis for the debate's second round, which started out with a summary of the themes, the points and the differing opinions. The topics were selected based on their relevance to the global debate on GMO's, differences in opinions between participants from North and South, and possible implications for Dutch policies. The four topics that were picked for the second

round were: “Options in food production”, “Poor patents”, “Rights and Choices” and “Capacity building”. Then the last process was to abstract different options into the policy implications. The organisers realized that this was a reductive process that involved interpretation. To compensate for this drawback, they tried to keep the methodology behind the selection process as open and transparent as possible. The methodology, and the reasoning behind it, was posted on the web page.

The concept of an open agenda setting, proved to be somewhat confusing in the first round of the conference. According to TNU many participants thus found it hard to engage in the discussions. The idea of a brainstorming session meant that ideas were running in different directions simultaneously it was rather unclear where the debate was going. This confusion was compounded by the fact that the moderations were very light, and the moderators were inexperienced with this form of online discussion. The use of dichotomies to framing the four discussion rooms initially led to some confusion among the participants. Many participants remarked that these issues could not be seen as either or questions. Instead of choosing between i.e. organic or GMO's, the majority of the participants felt that farmers should be able to implement both according to what specific conditions they operated within. The dualistic set up was therefore rejected. The organizers, claiming that the intention never was to choose between alternatives, rejected this critique. The dichotomies were supposed to highlight the dilemmas within the GMO's debate.

In the final round, the conference moved towards a more structured process of online communication. The agenda had been defined from the first round, and experienced moderators had been asked to lead the discussions.

The moderators and the participants from TNU occasionally intervened in the substantial direction of the conference. When this occurred it was mainly to steer the debate away from technical disagreements, and back to the social problem of the discussion rooms. As with the following intervention by a moderator in an argument over technical facts;

“Another approach is to start by defining what the needs and wishes of people are (no matter whether that's in industrialized or developing countries) and then find the appropriate technology for it, instead of starting from the technology”. (Conference transcript)

The quote says something about the framing of the debate, the explicit focus on social problems rather than technical factors in relation to GM technology. In the next section I will

investigate the narratives on GMO's closer. I will be interested in the stories the participants contributed, hence shaping the definition of both the assessment and the technology.

3.5 Narrative Level

3.5.1 Narratives on the Assessment

The presented objective of the conference was to create a channel for southern concerns into the Dutch debate on GMO's, to see whether such could manifest themselves in to coherent policy suggestions for the Dutch government. As I started investigating the case, I was interested in whether there could be other, spurious, interests behind the initiative.

For the Commission, the conference was about more than just GMO's policies. It was also about trust: Public trust in the decision makers within the regulatory area of science and technology, and trust in the food industry. To explain why trust and public participation is seen as pivotal for the Commission, he pointed to the political context in which the conference took place.

On a European level the GMO's debate was related to trust by the issue of food safety and consumer confidence. The opinion of my informer was that the recent mad cow disease and the pest among pigs had led to a public disenchantment with their European policy-makers and the scientific expertise traditionally responsible for risk assessments and regulation of the food industry. The debate over GMO's presented a new controversial issue up for decision-making within food production. This distrust was not a specific Dutch phenomenon, but a common European symptom recognized and debated in various EU papers. Along with the diagnosis came the prescribed remedy; the trust needed to be restored by involving the public in controversial technology assessment and decision-making processes (Liberatore, 2001; Levidow & Marris, 2001).

For the Dutch politicians a public debate on the issue of GMO's could indicate, “*what way the flag blows*”, before decisions were made. The whole GMO's debate had been considered a “hot potato”, and no final decisions with regard to regulations had been made in

parliament, even though the case had been debated for years. The different ministries involved were positioning differently. The issue of LDC's and GM technology had been highlighted by both media and civil society organizations, and it was found to be an important factor in the shaping of public attitudes towards GMO's (Commission report, 2001). Hence, there was a strategic interest in the "Southernvoices" conference. By probing the public opinions before deciding, the elected representatives could assure themselves against making decisions repelled by their voters.

Critique towards the Commissions work was coming from civil society groups. Environmental and social rights groups had been successful in reaching the Dutch public⁷. The stands of these NGO's were mainly negative towards the introduction of GMO's. The concern from the Commission was that the negative publicity surrounding GM food would cause a consumer boycott of products, consequently harming or even repelling the biotechnology industry. The critique from the NGO's was mainly twofold. First, the Commission was accused for a pro-biotechnological bias. This bias led to a determinism that excluded debates over alternative agricultural trajectories. Greenpeace for instance, felt that the debate should be much more problem induced, and they did not want to participate as a "Green alibi";

"Making this decision about GM is not only about a technology, it is not only about food. It is about our agriculture, about how we want to live, the landscape, biodiversity and safety"
(Informant 3).

The pro-biotechnology bias was seemingly incorporated in the very starting question of the Commissions work; "under what circumstances is GMO's acceptable for Dutch consumers?". Second, the NGO's criticized the narrow scope of the Dutch debate. They claimed that a debate over GMO's had to include the interests of LDC's.

These issues of trust were facing the Commission as they started planning the "Southernvoices" conference. Consequently the launching question of the conference was

⁷ Intense campaign activities by the Greenpeace, and other NGO's in the public discourse over GMO's, were identified by the Commission as "appearing to have had effect". Whereas in 1999 a majority (51%) of the respondents in national surveys indicated that GM foods would improve the quality of life, only one third (32%) said so in 2001. Less than half of the respondents in 2001 considered GM as needed, against 71% two years before (internal correspondence among organizers).

embracing the element of uncertainty and doubt; it said; “Can GM technology be applied with trust – and if so, under what conditions?”

From TNU's point of view, the conference was seen as a chance to create public debate around GMO's and development. It was an opportunity to create a platform for their network to interactively share information and generate new knowledge and ideas. When I asked one of the co-founders of TNU what she considered important with the “Southernvoices” event the issue of trust reoccurred, but this time from a different angle. While a participatory assessment and public involvement in decision-making was seen as a solution to the public distrust in policy-making and scientific expertise, TNU felt that such initiatives were also part of the problem. She meant that trust needed to be restored in the debates themselves. She referred to experiences from similar events as the “Southernvoices” conference. In these debates, the outcome had often not been clear. In the end, they had become nothing more than dropping opinions, without concrete results. She meant that this was because in these other public debates the link between the responsibility of the political body to take the results of the event, and the input, into the political debate was very tenuous. If that link is not clearly defined, then it is a “rubber stamp”, a phenomenon she explained as follows;

“A rubber stamp case is when policy is defined in a particular country and the policy is pretty much defined from the beginning of the process, but these events are being held, and then in the end they say, well you know you can't really argue with us because the on-line thing happened, we asked everybody to participate. These kinds of events then ends up giving legitimacy to the policy, it is not really taking the event itself seriously and the input. Their just saying, ok we have done it therefore we are legitimate” (Informant 4).

When people are not taken serious they will also become reluctant to participate in public debates. This argument on participatory initiatives was also supported by *Greenpeace*;

“Greenpeace would like to participate more, we would like to be listened to, but not on any grounds, I need to know in advance what my jurisdiction will be. And I don't want to be a 'green source', without real influence. You have to be careful in participation if they're really only after your good name and logo on their boards”. (Informant 3)

From the point of view of the TNU representative, the ultimate consequence of these “rubber stamp” cases is that people loose trust in politicians and scientific experts. According to her, this trend of distrust is especially strong in the developed world. She meant that for LDC's it is a different t kind of loss of trust. In these countries, the trend is that people often are more active on the local level, and not at all on the national level.

The “Southernvoices” conference aspired to become something more than a “rubberstamp” for TNU. It could be a constructive attempt to get people involved again, let them know that they had some impact. However, that could only work if the conference became something more than dropping opinions. And this was the momentum of the conference. TNU’s network could potentially influence Dutch policies in the area of GMO's and development. The prospective significance of the conference's outcome was clear, probably reinforcing the motivation to participate. For TNU the “Southernvoices” was a platform offered, and the potential for this platform to be amplified at a political level that really mattered.

3.5.2 Narratives on GMO's

Noteworthy was that the key differences in opinions depended not so much on a North and South divide, but on the various organisations people represented or worked for. A general conclusion is that the opinions between members of NGO's in North and South tended to overlap quite strongly, and the same goes for scientists who work in similar research worldwide, clearly LDC's cannot be seen as a homogeneous block, with similar interests.

From TNU's point of view, this was not the idea behind the conference either, they did not aim to generate consensus, to have people agreeing on everything. For this the recognition of the inherent complexity of the issues at stake, caused by the natural as well as the socioeconomic idiosyncrasies among the participants' local belongings, were too significant. Attempts were made in the procedure not to close, but to open the opportunities of interpretation, and stimulating an interactive sharing of a cross section of ideas. The purpose was rather to bring people together in order to generate new thinking and new ideas about the issue of poverty alleviation. This narrative seemed to ring true also for the participants. In the words of one of the contributors from Africa;

“I just want to comment on harmonising different interests for the common good. Let's be realistic to admit that such a harmonisation is near impossible. The GM evangelist simply stands poles removed from the organic devotee. Some of us stand in between and even if you should try harmonising our stands it might take all of your life. I think what we should do is first to agree on the ultimate goal. Feed the world. Ensure access and food security. We do this taking into account the different contexts, needs and suitability of the technology”. (Conference transcript)

Consequently, the discussion rooms focused on the incorporation of socioeconomic as well as technical factors in the assessment. Instead of simplifying the GMO's issue, the event aimed at creating something coherent, a mechanism needed to have impact on policy making.

That this may be a fine line drawn was recognised by the organisers. While they wanted to come up with coherent results, that could give policy recommendations, they also wanted to reflect the complexity of the issues at stake. As a consequence of this the focus thus landed on describing issues, not answers. Hence, giving room for potential for change, where policy could be directed.

For a more detailed investigation of the narratives on GMO's, I will enter the four discussion rooms from the final round of the conference.

Discussion Room on Patents

In this discussion room, the moderator addressed the existing global patent regime and its relevance for LDC's. The moderator focused on Northern MNC's dominating position. This dominant position potentially implies a threat, that the patenting system could limit farmers' access to seeds, or/and makes them dependent on private companies. The reoccurring argument among the contributions was that the existing patent regime in general leads to a divide among rich and poor countries, and more specifically between private and public interests. That this situation was a source of frustration among the participants was clear, an African participant came with the following outcry; "North needs soul searching!" The frustration with lack of democratic control over technology was a common contribution, like with this Indian participant;

"...the technology per se is fine, but the way it has been handled, the hands that it has gone into are the wrong hands. Why can't public sector get back, why can't society decide where it is better required to use GM? No, it is all happening in the boardrooms of the big companies; they decide what is good for society. It has gone beyond the control of the society. This decreases democracy." (Informant 5)

Other participants were not totally opposed to patents. It was recognized that the vast majority of genetic resources is located in developing countries, but that the R&D capacity to manufacture these resources is held by private companies in the north. Due to the profit led approach of this sector, the concern was that the existing regulations could lead to monopoly in the seed market, without adequate state intervention. Especially among members of NGO's a concern about access to seed, Farmers' Rights to reuse harvested seed for sowing, was demonstrated. It was pointed to the role of legitimate governments, to counter or offend such things by providing appropriate administrative mechanisms and national seeds legislations, by strengthening competitions law and by augmenting national agricultural research systems;

“What is urgently needed is to establish some limits to: the scope of patent protection; monopolistic control of markets and innovation; and domestic prices for patented goods. On the other hand, it is important that policies address the need for new non-commercial distribution channels for improved seeds. Poor farmers should not be left on the fringe of biotechnology innovations. Governments have to play a greater role in technology diffusion”.
(Conference transcript)

The activity of ‘biopiracy’ was also debated as it potentially could restrain opportunities for developing countries to benefit from their genetic resources. The participants considered the current patent regime inadequate in recognizing indigenous knowledge and traditional farming methods as sources for innovation. Due to the failure of recognizing this informal R&D, ‘biopiracy’ could flourish as MNC's patented and profited on genetic material that had been developed through generations in the local communities, without sharing results or profit. But, as one of the participants from India noted on the issue of ‘biopiracy’;

“Genetic conservatism will not lead to anything if those with the R&D capacities were denied access. Hence, one should also focus on the potential benefits of ‘bio-prospecting’”. (Ibiden)

The need for capacity building to better manage genetic resources was by many seen as the key to negotiate better terms and even exchange those resources for technology. As commented by an African participant;

“We need to strike a balance between access to genetic resources, and having technology transfer to the custodians of these resources”. (Ibiden)

The general conclusion of the patent discussion was that it has a number of negative consequences for LDC's, and alternatives should be looked for. Many participants pointed out that patents in private sector often rested upon basic research funded by public sector;

“Most genetic engineering research has been publicly funded--especially the fundamental original portion upon which most of the current developments depend. Allowing the fruits of this research to become a private monopoly is an ideological decision, not an empirically necessary one.” (Ibiden)

The discontent with the privately dominated patent system led to a suggestion of a state-, or intrastate, controlled alternative. The idea of a biotechnological equivalent to the Napster of music, and the Linux of software, a so-called “Bionux” was brought forward. An open system like a “Bionux” may speed up technological development and keep the results accessible to anybody. The public access to genetic resources was seen as the central principal among the

participants, and to protect access a supranational level should play the role of clearinghouse, such as the UN.

Discussion Room on Rights and Choices

In this discussion room, the moderator raised the questions of rights in regards to who should decide upon the future of agricultural production. How should these rights and choices be allocated between individuals, communities, businesses, nations and governments? How far can the different interests of these actors be reconciled to form a common position for the common good? The moderator asked the participants to respond to questions like; do farmers have the right to produce whatever they want, even at the expense of their neighbours' livelihoods and the environment? Have governments and intergovernmental agreements been effective assessing rights and costs and of regulating GMO's? What policies should be pursued to ensure an equitable outcome?

Relatively few farmers participated directly in the debate. Of those that did (primarily from USA, Canada and Australia) their concerns focused on the great dangers of contamination from GM crops. These farmers were concerned about their own lack of choice of agriculture, especially organic farming. The farmers also felt that it was governments' responsibility to protect their interests towards industry;

“The right of consumers and farmers to make choices must be protected! The power of the Corporations must be balanced by effective government regulation to level the playing field between the corporate desire to make profits and the rights of the public.” (Ibiden)

In regard to seed there is an obvious difference between the North and South. While farmers in industrialized countries are used to buying seed on a regular basis, small-scale farmers in LDC's often grow more crop varieties. These farmers are often in areas of high biodiversity and agro-biodiversity. They can therefore collect native varieties and develop new ones to a much higher degree than farmers in the North could. Therefore the issue of access to seed has much greater practical impact for those in the South.

Whether GMO's poses risk to the environment was debated in this discussion room. Participants disagreed on the answer and references were given to GM field trials, supporting

both sides. As the debate over the lack of evidential coherence among the empirical material did not lead to any clarification, the moderators intervened and directed the debate back to the regulatory aspects of the risk issues. The participant disagreed on who should be the responsible for risk assessment. Some meant that the responsibility should rest on the farmers to best secure the community's interests;

"It is and has always been the farmer's responsibility towards environmental risk assessment. Once the farmer is empowered, then the community is empowered, and once that is achieved, a suitable way shall be born wherein optimum co-operation between free-willed farmers would ensure maximal benefit in terms of sustainable agriculture, ensuring yields and increased confidence in new ventures". (Ibiden)

But it was also agreed that it should be a governmental responsibility to establish institutions for risk assessment. Such assessment should include socioeconomic and technical factors. And the assessment should include local representation and responsibility;

"I believe that ultimately it is the responsibility of the Government to create conditions for observing proper procedures and safeguards for having a responsible use of GM crops. But Government alone can not do much without support of communities. There is need for educational and coordination initiatives". (Ibiden)

Due to the widespread corruption at official levels in many LDC's, the participants pointed out that an official organ for risk assessment needs an inherent system of checks and balance built into it, to ensure the independence of the test results.

"The government is responsible for maintaining the peace and stability of the state. To this extent, environmental risk assessment is part of that responsibility. But in a situation where governments all over the world can bring their credibility into question, it is time for independent institutions to validate or simply complement the efforts of government. Possibly we should have independent scientists or international agencies becoming active in risk assessment and monitoring." (Ibiden).

Discussion Room on Capacity Building

The need to build capacity in LDC's clearly constituted one of the most important aspects of the GMO's issue among the participants. There appears to be a lack of knowledge, skills and resources in LDC's to make informed decisions and to effectively create and deal with the potential advantages of GMO's. These resources are capital intensive and most developing countries depend on international support for implementation GM technology that can benefit the poor, as this Indian participant pointed out;

“For the developing countries like India and Sri Lanka the application of GMO's means huge sums of money, this is beyond their reach on many instances. In India there is manpower and skill to apply GMO's, but finance will be the bottle neck”. (Ibiden)

The moderator on the other hand, questioned the key role capacity building had for development of GM technology in southern countries. She challenged the apparent idea that sufficient capacity would help involve the public more closely in policy making, set better, more appropriate research agendas and implement the legislation and regulations necessary for a responsible and effective transfer of biotechnology and monitoring of GMO's. The discussion brought up the structural problems involved in transferring technology across cultural, political and scientific borders. To believe that a technology transfer automatically stimulates development of the technology reduces capacity building to a residual category. Scientists from the South were very clear in highlighting that their practical experiences in research differ from the typical situation in research institutes in the North. This point is highly relevant to the success of capacity building programs, showing that technology cannot automatically be adopted. Technology needs adaptations to fit the receiving environments standards. Moreover, capacity building programmes should consider specific local conditions such as ethics, religion and culture. One African participant claimed that lack of result orientation had led to under-utilisation of resources;

“...capacity-building has to be focused at particular needs. There is under utilized capacity in some developing countries, including here in Africa, and this is largely a result of that capacity not being tailored for the priority needs. Capacity-building has to address specific needs, because, the capacity required by one country elsewhere is certainly not what another country also requires.” (Ibiden)

Participants indicated that the donor agencies responsible for capacity building should be more critical of the impact of their efforts and the use of GMO's as a solution;

“Some capacity building programmes implies that GMO's are already there and acceptable without questioning the basic assumptions of GMO's and its associated limitations e.g. patenting/control, imprecision, ecological ramifications, etc”. (Ibiden)

Questions were raised about how these agencies identify capacity-building objectives. The content and methodology of their programmes and whether their capacity building initiatives are integrated in the wider objectives articulated by the recipient countries in the

areas of public awareness and empowerment. Evaluation among donors of who their programmes really benefited was called for;

“Capacity building for regulation for responsible and effective transfer of biotech and monitoring of GMO’ is directed towards enabling government agencies to support the business of MNC’s and to the detriment of small farmers in the south“. (Ibiden)

Discussion Room on Options in Food Production

In this discussion room, the moderator addressed the inadequacy of today’s food production and distribution systems to meet the challenges of hunger and environmental deprivation. Problems amplified by the global population growth. Based on the current situation for developing countries and the technological alternatives available she asked the participants to discuss which future agricultural systems are the most adequate. Further, what was the role of science in this scenario, and how should markets be organised.

GM technology in agriculture is often contrasted to organic farming in public debates over agriculture; whereas the latter is seen as more “natural” and environmentally sustainable (See i.e. Greenpeace, 2002). This dichotomisation characterised this discussion room on agricultural trajectories. Advocates of organic farming were primarily coming from northern countries, especially farmers and members of NGO’s. In general, these participants prioritize rural livelihood, bottom-up approaches and the rights and choices of small-scale farmers. For this group the protection of indigenous knowledge and traditional farming methods are also important factors. Their perspective towards GM crops and the form of agriculture that goes with them is highly critical. GM crops are often seen as either unsustainable or unacceptable.

“As an organic farmer I believe we need a paradigm shift away from technological solutions to social and economic problems. If farmers were to become a learning community free from the debt and exploitative agribusiness structures they would not turn to GMO’s. To an organic farmer, GMO’s are alien constructs divorced from the ecological complexity of the real world, and divorced from the soil as the ultimate source of nutrition. Organic farming is a social movement which embraces sustainability as well as social justice.”
(Conference transcript)

This critique is supported by the lessons they have drawn from the Green Revolution⁸ or the introduction of agricultural practices that do not take the needs of small-scale farmers into account. Members of these NGO's opt for agricultural research and development that is participatory. An Indian participant was also concerned that GMO's would be sold as a `technological fix` for hunger;

“My only concern is that importance of GM technology as a tool for community may be hyped so much that the other essential components for development like building up social capital, education, population planning, infrastructure etc may not be given adequate attention. (Ibiden).

There exists no common understanding on what the lessons from the Green Revolution are, whether it has increased or decreased food insecurity and environmental derivation. Among many of the southern participants from, especially India, the success of the Green Revolution in increasing food production was considered more important than the claimed contaminating effects it has had on the environment. This group of participants demonstrated a strong technological optimism, giving examples of GM products designed to meet particular needs, such as vitamin-fortified vegetables fighting malnutrition.

“Without the torch of scientific knowledge, traditional knowledge remains under-utilised. For example, the farmers in many parts of India have entrepreneurial spirit and traditional wisdom acquired through several generations of farming. But these farmers could not make much progress without "miracle seeds" during green revolution period. These farmers can also prove their competence again if they are empowered with GM crops and other improved technologies.” (Ibiden)

Some advocates of scientific progress were also protectionists on behalf of science autonomy from policy intervention. The reasoning was that policy makers often had insufficient knowledge and thus lacked competence to direct science and technology. A critique was directed towards northern stakeholders for underestimating the ability of southern farmers to adapt to modern agricultural technologies, such as GMO's.

The debate over the successes and failures of the Green Revolution attracted high level of controversy, and its resemblance with today's debate between organic or GMO's was pointed out. There were also many contributions in between these two poles. Participants

⁸ The 'Green Revolution' refers to the development of high-yielding varieties in the 1960s. Their higher yield depends on the use of agrochemicals, irrigation and other purchased inputs. Their use substantially increased grain yields of wheat, rice and maize. Also involved loss of some other benefits, like less straw for animal feed, monocultivation and increase in use of chemicals (Allen & Thomas, 2000).

believing that there should be interplay of traditional knowledge and transgenetic production methods;

“I believe that there should be interplay of traditional wisdom which is generally quite location specific and scientific knowledge which can be generalised for a range of situations. We need both types of knowledge” (Ibiden).

A general agreement was that interdisciplinary efforts were called for, and that in order to come up with coherent policies, policy makers needed to gain more insight in the scientific knowledge in question.

3.5 Reflexive Level

As the conference came to an end, a final report was written and delivered the Terlouw Commission. Not many concrete policy suggestions were included. Nevertheless, the arguments on GMO's and development that surfaced at the “Southernvoices” was included in an own chapter in the report of the Commission. For my informant with TNU, this shows that the event proved to be more than a “rubber stamp”. TNU is actively promoting online conferences as a medium for public discussions, and the “Southernvoices” conference is fronted as the prime example by the university.

The Commission member’s evaluation of the “Southernvoices” differed from that of TNU;

“I think some of the conclusion could have been drawn much sharper, even on the limited amount of the material they had. I have tried my best to include these conclusions in the final Commission report, not everything, only one small chapter, the Terlouw debate was not about the South it was about what happened in the Netherlands”. (Informant 2)

Some of the informant’s remarks made me reconsider the conclusion drawn by TNU, that the “Southernvoices” had avoided becoming a “rubber stamp”. Even though the Commission report incorporated the abstracted result of the “Southernvoices” conference it was not without debate within the Commission. Some of the scientists in the Commission found the questions that were asked during the conference to be irrelevant or wrongly phrased, thus, not objective enough. Others found the process to be too short and superficial, and further pointed to the small number of participants from the South. There were also remarks within the Commission that the conclusions were mainly irrelevant to the Dutch position on GMO's. So, the critique was both on substance and on form. However, the

conclusions were on the whole accepted after discussion, and the Commission agreed that the “Southernvoices” conference provided one way of involving some Southern views in the debate. This result may be a product of the lack of controversial results, as my Commission informant later pointed out. When the report was released for the press, the “Southernvoices” did not receive any particular interest. According to the Commission member, this was a consequence of the lack of controversy in and around the conference;

“If there’s no conflict it is not newsworthy. The “Southernvoices” did not raise any conflicts, so it was not noticed”. (Informant 2)

My informant further concluded that the result of the “Southernvoices”, and the Terlouw debate in general, was not taken serious by the government or the parliament.

“...well everybody said it was a wonderful report, but they did not do very much about it, because the political parties had made an agreement that they would go one with anyway. So not much happened afterwards, that I deplore, but that is for the government to take better care of what to do with a public debate like this. My sense is that only by taking the citizens seriously and exposing a number of issues which will come up, we can prevent the prevailing tendency of declining public trust in science.”(Ibiden)

This conclusion was based on the lack of importance given the issue of GMO's in the party programmes of the main political parties. It was also clear that the parliament, with the majority coalition had already made up its position towards GMO's, and consequent Dutch policies in international forums already before the report was presented (Informant 2). Consequently no policy changes occurred as a result of the conference. This reduces the participants' input in such a way that they merely serve as legitimisation devices for certain options already made. Maybe, in the end, the “Southernvoices” conference became exactly a “rubber stamp”.

3.6 Concluding Remarks

The initiating of the “Southernvoices” conference was largely built on a rationale, that participation and influence could remedy an element of distrust among the public towards technology and governance. Such participatory assessments can stimulate public debate and responsibility for the consequent decision-making. But then the politicians and the biotechnological industry must take the results serious. One must avoid that participatory

technology assessments become 'rubber stamps'. Lacks of receptiveness towards the generated result will eventually increase public disenchantment with the regulatory processes of technology. According to my findings, the "Southernvoices" conference may have fallen into this trap. Even though the conference attracted a significant number of participants, the results of the event did not lead to any large debate among the participants, and later on in the public arena, among the decision-makers, or in the scientific/industrial community.

Representatives from industry and the Dutch pressure groups that had been so vociferous in the broader Terlouw debate were not remarkably present in the conference. These are often depicted as the most prominent parties of social conflict within the public GMO's debate. The "Southernvoices" conference can be interpreted as not only an arena for generating policy suggestions, but also an arena for manifestation of social conflict. The Commission wanted to attract a wide audience that could express opinions for so to see how these opinions could make an impact on policy. If prominent stakeholders were not present on the arena then this means that the abstracted policy suggestions inadequately reflected the on-going social debate. The environmental organisations views were to some extent incorporated in the arguments of the northern farmers. They advocated a bottom-up approach and sustainable agriculture.

Many of the issues addressed in the discussion rooms identified industry as a source to problems. In the patent room, private interests and drive for profit was seen as a threat to farmer's access to seed variety and local genetic resources. In the rights and choices room industries role in risk assessment was questioned. These types of discussions could have been more constructive with industry present. Even if it would not have changed the positions of the participants, it might have given the southern voices an important channel to elaborate their opinions and demands to a dominant player within the development of GMO's. The potential of a participatory approach to technology assessment as an arena for rational argumentation over social conflicts was, thus, weakened. Discourse in such social setting can be remarkably different from public discourse often pursued in mass communication. Participants in mass communication tend to use the rhetoric of arguments, but rarely observe the discipline of argumentation. They normally confine themselves to the statements of their own strongest points, neglecting countervailing arguments or selecting for consideration only those, which they can easily refute. If a participatory technology assessment should produce more than a replication of the arguments and dividing lines found in mass communication, the

assessment needs to establish clear rules for argumentation. The steering of the discourse should likewise ensure that the participants take the rules seriously. The presence of advocates of opposing views guarantees that the full range of arguments and counterarguments are considered. Selectivity cannot be maintained. The participants may well be committed to restrictive positions and strategic interests, but as long as they participate in the process of communicative interaction they can hardly ignore requests to substantiate reasons, to take objections into account, to present empirical evidence for a statement, and to consider counter-evidence (Van den Daele, 2002).

Another backdrop is the marginal representation of policy-makers from developing countries. Many of the debates addressed the need for national interventionism. Governments were considered important in regard to regulations of genetic resources, protection of capacity building and as directors of risk assessment. A direct channel to representatives from this level might have initiated work on such ideas.

The participants often identified the intergovernmental level as a solution for many of the problems raised. In the patent room a biotechnological “Bionux” was seen as one of the most promising policy suggestions. The proposal was that organisations such as the UN or the CGIAR should act as an IP clearing house. As with the lack of industrial representation, the debate could have taken a more constructive turn if these organisations were represented, to respond to the suggestion.

4.0 “Indian Citizens Trial”

- A Token from the Poor –

4.1 Background

The first citizens' jury on GMO's in a LDC took place outside a farm in the state of Karnataka, India, between 6-10 March 2000. The trial was set at B G Kere, a small village in the dryland area of the Chitradurga district. A high proportion of the village inhabitants are marginal farmers and landless peasants. The key objective behind the trial was twofold. First, a “citizen's trial” was seen as an innovative way to involve the local community policy debate. Secondly, it was an attempt to bring the perspective of the developing world's farmers to national and global debates on GM crops. From *ActionAid*'s point of view, this group constitutes the “real experts” in the GMO's scenario. They were the ones with practical experience of poverty and local agricultural conditions and they are the ones that could be affected by introduction of GM crops.

The trial process is designed using a citizens' jury, guided by a panel of diverse stakeholders and carried out by independent local facilitators. The jury spent four days hearing information from “witnesses” on the merits and limitations of GMO's. The subject under discussion was the potential future role of GMO's in the context of reducing rural poverty and promoting sustainable agriculture. Having heard four days of evidence for and against the use of transgenic seeds, the jury member discussed whether such crops would improve their livelihood or increase their poverty and insecurity. The jury then gave its verdict on the question: “*Would you sow the new commercial GM seeds proposed by the Indian Department of Biotechnology and Monsanto on your fields?*” The results were: 4 yes, 9 no, 1 invalid ballot paper by secret ballot. The jury's rejection of the GM seeds was not simply a negative response. It was supplemented by a list of actions that should be taken by the government and multinational companies (MNCs) to get gain acceptance for their new seeds. The jury's judgement thus only had moral and no legal weight. The NGO, *ActionAid* who set up the trial wanted to provide a public platform so that those who would be most affected by this new technology could make their voices heard and have a chance to acquire information and form opinions about plans that could radically affect their lives.

4.2 Organisational Level

ActionAid was founded in 1972 and is today one of the world's largest development agencies, working with over seven million people through their 35 international branches. *ActionAid* is focusing their effort within seven areas of development, whereof the "Food Rights Campaign" is the one that covers the GMO's issue⁹. The *ActionAid* headquarter is situated in London. This is considered a strategic location since the city is the media capital of Europe. *ActionAid* also operates from different regional offices, acting autonomously on the national priorities. The citizens trial on GMO's was initiated and conducted by the Indian office.

On a local level *ActionAid* works mainly with fieldworkers, campaigners and some policy makers, though normally not directly with farmers. They interact with farmers' coalitions with food security issues, as with the WTO negotiations. When they have an agenda, they form a 'circle' of stakeholders such as farmers' organisations and grass root movements. *ActionAid* consider the ability of forming broad alliances at all levels of society a key element of success in the fight against poverty. Thus, they are collaborating with both global and local actors in their operations. Besides from London, *ActionAid* also have two other northern offices, one in Brussels focusing on lobbying the EU. The other office is in Washington focusing on advocacy and fund raising. This organisation reflects the simultaneously local and global efforts of the organisation. Their local operations are directed towards to the practical fight against poverty. Their efforts in the international level involves media campaigns, advocacy and lobby operations that targets the structural causes to poverty. Through this approach, *ActionAid* aims to function as an intermediate organisation between grassroots communities and global stakeholders in the GMO's complex, even though *ActionAid* has no direct position on GM technology, they are concerned with some of its feature. These aspects are coupled to the global trade agreements included in WTO – TRIPS. They are concerned about the level of control this could lead to, where power is shifted from local communities and end-users to multi national companies who's primarily concern is profit. Nevertheless, *ActionAid* is not rejecting the technology *per se*. Rather the local farmers should have the opportunity to decide for themselves, based on the local food production

⁹ The other priority areas of *ActionAid*'s work are, women's rights, education, emergencies, peace building, HIV/AIDS, and international aid.

system, their specific conditions, needs and demands. My informant with ActionAid explains this focus on the socioeconomic context of a GMO's introduction;

“In the case of a controversial technology such as GMO's, a wider understanding of the inter-linkages between biotechnology, corporate control, and local power structures is more likely to be achieved by taking a scenario approach than by merely asking a jury to say “yes or no” to a particular technology. In Karnataka, the comparison was of two starkly different technological approaches to agriculture (or visions), one based on GM seed and continued chemical use, the other on saved indigenous seeds, traditional technologies and organic methods. GMO's were thus not taken and judged in isolation - they were perceived and evaluated as an integral part of a wider system or development model.” (Informant 6)

The socioeconomic framing of the court case, led *ActionAid* to approach *Monsanto*, the worlds largest producer of commercial transgenic crops, and ask whether they would take part of the trial as defenders of GMO's. Together with *Monsanto* a governmental office for research participated as the advocating side for GMO's, they were invited not only to tell the jury about the public experiments that had been conducted with GM Sandalwood trees. *ActionAid* also wanted them to participant, so that they could bring back views and suggestions from the jury on policies. On the prosecuting side, *ActionAid* had gathered Indian environmental and social rights groups, and farmer's organisation. These groups were all against the introduction of GMO's, and they were advocating the alternative scenario emphasizing an environmental friendly production, local knowledge and traditional technology.

The constellation of expert witnesses was not randomly chosen. It aimed to reflect the global debate on GMO's. The two sides of the court were to echo the controversy of opinion on GM technology implemented in food insecure communities. The common ground, was the desire to spread knowledge on alternative agricultural trajectories, and involve farmers in the assessment of GMO's.

As the prosecutors and defenders for the trial were gathered, *ActionAid* started selecting the jurors. These were all picked randomly by a local grassroot organisation. The jurors were picked on the basis of three criteria;

- They should have no prior knowledge to GMO's
- They should not hold any representative function in the community or politics
- They should be within the governments definition of poor

The final jury was composed of fourteen small and marginal farmers. These jury members represented the variety of farming traditions, income levels and social groupings. Reflecting *ActionAid's* priority of women's role in agricultural production, the jury consisted of eight women and six men. The trial also involved other participants and observers. Scientific Institutes, commercial biotechnology corporations, development NGOs, Farmers Unions and Government agencies were represented among them. This multi-stakeholder panel should ensure that the jury event was conducted in a trustworthy and fair manner.

The issue at stake was whether GMO's would lead to any reduction of poverty and increase the farmers' food security. Hence, it addressed a social problem. The case further opened for alternative solutions, as the prosecuting side advocated another technological trajectory as a better way of solving the issue. The jurors task was then to answer whether they meant that they needed GMO's, and what kind of farming that for them was socially and ecologically acceptable.

4.2 Technological Level

The "Citizens trial" was designed to adapt to the local conditions of the jury members. Hence, the trial took place in the backyard of a village farm beneath the shadow of a tree. The implementation of modern communication technology is nevertheless not insignificant in this case. As we have seen the objectives of the trial had two distinctive levels. The first was the assessment of GMO's for this specific local community. The other level aimed at strategic media and advocacy activities communicating the outcome of the trial. The low-tech setting of the court case was reflecting the reality and the premises of the jury members. Bringing the expert witnesses to their home ground, the location for the potential introduction of GMO's was a factor in the steering level that *ActionAid* implemented. They wanted the trial to turn the normal power relations upside down. The setting gave the farmers the security of acting on home ground.

When the case was to be brought to the global level and the result diffused to the broadest possible audience, with an effective message, the internet provided a powerful tool. Along with the incorporation of the case on *ActionAid* extensive homepage, press releases

from the organisations headquarter in the media metropolis in London were circulated, and the methodology and the verdict was spread through *ActionAid*'s network within the global civil society. The Internet provided an effective tool for *ActionAid*. They could disseminate information quickly and effectively as well as communicate with other actors and with the broader public;

"The Internet allows social activists to reach large number of people, at little or no cost, who normally would never hear of i.e. the TRIPS agreement negotiated in a far away place and would never think that it would potentially influence them directly" (Warkentin&Mingst, 2000).

The trade-off by the use of the Internet as a medium is that it is a forum where the most extreme statements attract attention: where an argument scrolling down a computer screen may garner authority it does not deserve (Ibiden). This point should be considered in the publication phase of the results of the citizen's trial. As already mentioned the publication of the trial results had two lines of publication. In the media and internet publications it seems like populism won in the short run. Scrolling down the publications gives the impression of a 'Yes/No' debate, tactically catching immediate attention, and giving a concrete answer to the reader. The academic literature, and the analysis presented in formal forums are more nuanced and complex.

It can be concluded that the use of internet as an amplifier towards the public, provided *ActionAid* with an adequate tool as they targeted public opinion. The Internet was an effective tool in regard to the scale of people that was reached, especially considering the immediate attention of a "Yes/No" verdict in headlines.

4.4 Steering Level

The jury was designed along the lines of a formal court trial. The formality of the court trial format and its very confrontational nature were the key elements in this experience.

The case was presented to the jury in the same way it would be in a real trial. This consisted of a definition of GMO's and the presentation of the questions to be answered by the Jury.

These questions were formulated by *ActionAid* and approved by both prosecution and defence. Definitions of important concepts and the parameters of the case were decided in discussion between representatives of both sides before the trial began. During the event a

judge, two lawyers (the defender and the prosecutor) and the jury, listens, cross-examines and weighs up the evidence presented by the witnesses from many disciplines and professional backgrounds. A special feature of the trial, is that the jury member themselves are allowed to ask questions, thus trying to ensure that the language and the temper of the trial is kept open and the questions answered with care and consideration, exploring aspects of the GMO's debate that are of particular interest to poor people, and comparing GMO's benefits and risks relatively to the prosecutors technological scenario.

The jury's primary function is "the infusion of community values into the legal system by interpreting legal standards and specific factual patterns according to changing community norms of conduct and justice. The juries arranged by *ActionAid* do not hold any direct experience of issues of scientific and technical complexity, the question of the juries competence to discuss them are then often raised. The institution of jury is considered to place a burden on those presenting evidence to communicate it in a clear and accessible manner. As the jurors are presented with different stakeholders arguments towards GMO's, their function is to contribute to wider debate (then i.e. an 'expert panel') about policy options that further the common good.

The other aspect of power shift in the trial was the temporary “disempowerment” of the debate leaders, since they were now subject to public judgement by the very people normally considered “ignorant” in this debate. Scientists, government officials and even many NGO representatives often talk about the poor and the marginalized, and claim to act in their interests. Yet actual dialogue with the poor rarely takes place, and this often results in a false view of the interests of these groups and the risks they face. The jury offered a situation in which experts and powerful decision-makers were suddenly confronted by the poor and 'ignorant' that, as jurors, briefly occupied a position of power and of decision-making.

My informant with *ActionAid* also wanted to highlight another advantage with the Court case format over the more traditional seminars and conferences set up on the Indian debate on GMO's. As he perceived it the GMO's debate is a highly divisive one. On the one hand there are the strong views and arguments in favour of GMO's primarily expressed by the Indian government and industry. On the other hand, there are strong and persuasive arguments against GMO, mostly defended by social rights groups and environmental organisations.

However, it is hard to find middle ground, where the differing arguments can be presented without bias. Furthermore, most discussions on GMO's in India take place in seminars and conferences of 'experts', mainly scientist and politicians, and are closed to the general public. 'Experts' are invited to present their views and to 'lecture' on their perspectives but they are never challenged or confronted by the 'other side' or by those who have 'no side' (Informant 5 & 6). These expert forums are closed circles of discussions and their objective is not to increase reflection and learning. What *ActionAid* tried to do, with the simulation trial, was to open up the closed nature of the GMO debate in India by allowing people who had no previous opinions on the matter to take the lead in the debate. This made possible a direct and transparent confrontation of arguments normally considered to be the 'only truths' available. For *ActionAid* these approaches are seen to have the potential to empower people to move beyond being passive recipients of development policies or users of externally imposed technologies. The citizens thus can become active “makers and shapers” of the policies and technologies that affects their lives. The “citizens trial” therefore seen as a mean to enable citizens to assess the pros and cons of GMO's implemented for small scale farming in India. Through implementing this specific citizens trial methodology, *ActionAid* aimed to create a mediating platform between the local actors with the practical knowledge and experience of poverty and agriculture, and the structural and international system of trading and regulation of agricultural technology.

4.5 Narrative Level

4.5.1 Narratives on the Assessment

From *ActionAid*'s point of view, the idea behind the jury was to question who is to judge whether GMO's should be introduced into a country. Whether this decision should be left in the hands of scientists, politicians and economists? The initiative aimed to highlight that the poor as potential end-users seldom are consulted in these discussions. These are groups that have never been properly consulted about the issue before and are still not in a position to really influence decisions taken by government. Nevertheless, they are the real promoters, critics and in many cases victims of GMO's. *ActionAid*'s, therefore, believes that they should be the ones judging the introduction of this particular technology. The underlying principle

was for them a belief in rural people's democratic rights, and sufficient knowledge, to judge the issue themselves. The aim was to have a bottom-up process where a spectrum of those who could be affected by GM crops judge whether they could make their livelihoods better, or whether such crops would increase their poverty and food insecurity. The trial focused at the local level, how GMO's would influence the practical every-day life of the farmers in question. The belief of *ActionAid* is that only with the full involvement of poor and marginalised farmers can development initiatives of whatever kind bring benefits to the most vulnerable communities. The general objective of this initiative was to ensure that the views of those with a real, practical knowledge of 'feeding the world' are put in their proper place at the forefront of the biotechnology debate.

Given the socioeconomic framing of this trial on GMO's, to engage *Monsanto*, as the main private player, was considered of vital importance for *ActionAid*. Having *Monsanto* present gave the trial a realistic reflection of the global debate on GMO's, as *ActionAid* conceives the debate. *Monsanto's* presence also intended to fulfil another function. According to *ActionAid*, the jury could also be an effective means of eliciting popular needs and demands that are independent of the interests of different stakeholder groups but that are respected by such groups. Therefore *ActionAid's* intended the trial to be more than an adversarial event, it was also meant as an arena for dialogue. Dialogue between the local farmers, potential end-users of GM seed, and the multinational companies as producers of the products. By bringing together these two sides, the opponents and the promoters, of the GMO's debate, *ActionAid* had a broader objective than in a formal court case. An element of learning was integrated in the organising of the trial. For the farmers this was an opportunity to attain knowledge on modern biotechnology. The "citizen's trial" specifically aimed at making complex knowledge accessible for people with no prior knowledge to GM technology. Many of the farmers that participated in the jury felt that the issue was of such importance that they prioritized to be present, even though this meant taking valuable time off their daily activities on their farms.

Monsanto acknowledged the "Citizens trial" as a platform for dialogue. In 2000 the company implemented a five points pledge directing conducts of behaviour and societal objectives considered important for the companies profile (Monsanto, 2002). This pledge specifically addresses the problem of hunger, and the company's potential role for poverty eradication. Consequently *Monsanto* has through a commitment of sharing, engaged itself in

non-profit research and free licensing of specific crops that are important for developing countries. The pledge also addresses the need for dialogue with marginalised farmers, in order to be receptive towards their needs. Transparency and accountability in development and diffusion of products are among the new principals. This involves broadening the inclusion of potential users and consumers of their GM product in the assessment process. Participatory approaches is seen as a way to fulfil this principal. This implied that the company should work to strengthen farmers' own decision-making, and treat them as equal partners in a dialogue. The pledge further recognized the rights of poor people to decide themselves.

This change in the companies profile occurred, and should be seen in the light of, strong pressure from civil society. Among other things the company was under attack for having developed "Terminator seeds" - GM seeds that produce sterile plants. These species could cause a relation of dependency among farmers since they would have to return to the seed company every year for new seeds. This is especially relevant for countries where competition between seed companies is low or there exist a monopoly in the market, most often developing countries. Together with the pledge came a halt in the development of this technology. *Monsanto's* positive attitude toward the trial can be seen in the light of this shift in the company's profile.

When the *Monsanto* representative explained his reasons for attending the trial, he pointed to what relatively new a technology GMO's were based on. He felt that;

"The Indian farmers (and also others) have a long way to go in understanding the science behind these products. Thus, whether they speak in favour or against these crops should not be given undue importance at this stage". (Trial transcript)

Nevertheless, the *Monsanto* representative meant that the trial had been a good initiative bringing the farmers closer to scientists. It has a lot of educational value and must continue. *Monsanto* also appreciated the concerns about the potential (natural) risks posed by GMO's. They see it as a problem that fears quickly overtake facts. Stakeholders have enormous responsibilities in reversing this general trend. The trial was for *Monsanto* seen as a step towards this endeavour.

When I asked Devinder Sharma to comment on *Monsanto*'s representation in the court, he made it clear that he did not see this as an attempt to engage in a dialogue with the farmers. Rather he described it as a PR-gimmick. As he explained;

"This was a PR exercise, and if they (Monsanto) had boycotted it, they would have sent out the wrong signals. So they had to participate, and also at the same time they had a chance to see what was happening at the grassroot level. Then they could go back and tell their bosses what strategies they need to develop. They knew the decision from the farmers before they came, but they still came because of the signal effect, and the right signal was, that people participated then they were also participating, they are not outside that system. That was the signal they wanted to convey." (Informant 5)

To sum up, different narratives on the organisation of the "Citizen's trial" circulated, narratives that support different objectives and different actors' involvement.

4.5.2 Narratives on GMO's

ActionAid believes that poor people's control of food is under threat from global trade agreements dominated by rich nations and profit-driven multinationals. They are especially concerned about the impact of GM foods and crops patenting on poor farmers. Hence, *ActionAid* claims that it is not the technology, or the specific products they are concerned about. Rather it is the trading system that comes along with it. This point of view, already mentioned, led to that the trial was framed around a socioeconomic evaluation of the introduction of GMO's. The "green" representation in the prosecution reflects the focus on the ecological aspects of GMO's. These two aspects were the main criteria for the assessment. The GMO's complex was then set up against an alternative of more organic styled farming to abstract the benefits and threats that each system presented for the local farmers. In order to make the debate comprehensible for the jury members, who had no previous knowledge to GMO's, the prosecutors carefully elicited from each witness the information relevant to the farmer's livelihoods. Rather than attempting to build up a basic knowledge of genetics, they asked whether the 'new seeds', as they called them, could address their needs, such as returning organic matter to their soils, and reducing their susceptibility to rapidly changing market prices for their harvested produce. The defenders presented GMO's by two practical examples of its use; the Governmental research office used GM sandalwood trees as an example, while *Monsanto* presented their Bt cotton. As the *Monsanto* representative entered the trial, he was determined to discuss the technology and not the company. The witness advocated for GMO's on the grounds of the technology's advantage over traditional farming

methods. These advantages were especially in regard to the improved quality of the product itself, better taste, longer lasting etc, in relation to the environmental aspects, crops that did not need pesticides, and finally in relation to weather condition, more weather resistant crops. As a witness, the *Monsanto* representative demonstrated what could be interpreted as a technological determinism towards the problem addressed in the court case. As he testified for the jury:

"Now a stage has been reached when the farmers will either have to spray, or they will have to pray. So we have reached such a situation today. It is during this situation that trans-genic technology seems to have come to the rescue of the farmers." (Trial transcript)

For Devinder Sharma, this presentation, of GM seed as a savior is not surprisingly. As he says;

"The knowledge among Indian farmers about GMO's is pathetically low. They think it is a "miracle seed", due to the propaganda machinery of Monsanto hand in hand with the Indian government. They have been told that this is a miracle seed that will take care of pests and so on. So they fall into the trap". (Informant 5)

Sharma further elaborated on the problem with the GMO's debate in India. As he saw it, one of the major issues was the lack of information and education among the farmers. And he further questioned government initiatives to remedy this situation, and to direct pressure towards the MNC's to conduct R&D that could address social problems. But as he saw it the Indian government, and also the scientific community, did not act on behalf of the countries poor;

"The problem is that, now it is the biotechnology industry that hosts the money. And governments all over the world, have begun to represent industry. They have forgotten about the people. When Abraham Lincoln said; "democracy is of the people, for the people and by the people". Now the definition of democracy has changed, it is "of the industry, for the industry and by the industry". It is very sad that the academic world, as the policy makers, they are in tune with the industry. Why because the academic world, the universities need the money. And he who has the money makes the mare go. Research is oriented towards promoting biotechnology, even though the world does not require it. That's the sad part, and I don't know how long this will go on, but it will eventually end up adding on to hunger as I have been saying." (Informant 5)

Sharma, who himself is a trained geneticist, is positive to the technology *per se*, he says that it bears potential that may benefit the poor. But he rejects the notion of a 'technological fix'.

The jury also questioned the *Monsanto* representatives argument of a 'technological fix', the jury lay down some criteria that needed to be fulfilled if they were to implement

GMO's in their farming. The jury for instance concluded that extensive field trials of 5-10 years should precede the release of seeds into the market; that the focus of all programs of development should be self-reliance; that innovations in agriculture should ensure the farmers' right to save, breed from and exchange all seeds; if the seeds were to fail for any reason which had to do with the technology itself or weather conditions, the MNC's should not only compensate for the losses, but also buy up the crop at double the price. The response from *Monsanto* is interesting. A proportion of the farmers had said they were afraid of any contact with the MNC's, having heard about them in the context of WTO and patents. They feared that powerful MNC's that develop seeds in laboratory conditions would gain control over seeds and farmers' sovereignty. The *Monsanto* representative responded in the following way:

"Farmers should be more concerned about the technology rather than who is providing it, MNCs may provide technologies that may enable local companies to produce new seeds and help local farmers."
(Trial transcript)

On the question of compensation, there was a limited response;

"It is unreasonable to hold companies responsible for crop failures due to weather conditions."
(Ibiden)

Over all the *Monsanto* witness avoided addressing the socioeconomic context and how this could be affected by introducing GMO's. After all, the companies pledge for social responsibility and sharing of benefits may not have worked its way into practice yet.

From the prosecuting side, the focus was on what they considered viable alternatives to GM technology. They were eager to state that they were not against modern technology, but they warned against potential threats to the environment. If GMO's was to be accepted, they needed to be;

"...used carefully in line with principles which maintain the ecology of the region, and also as a technology in control of the people." (Ibiden)

The over all impression from the trial is that there are two conflicting narratives at play. From the defense introduction of GMO's are technical answers to the problems facing the farmers. From their point of view, they identify these problems to be caused by weather conditions and farming methods unequipped to meet those challenges without contaminating the ecological

environment, such as pesticides. The socioeconomic factors that may be spurious causes to today's situation, and the socioeconomic effects of GMO's are considered irrelevant or outside the area of responsibility of the company.

On the other side of the court were the opponents of GMO's. From their perspective, it was important to show that there are existing alternatives to the problems facing the farmers. Thus, rejecting any GMO's determinism in the search for solution to the poverty problem. These witnesses, mainly NGOs, as well as the defenders, emphasized the environmental friendly profile of their proposed trajectories, involving organic farming or a cross section of organic and traditional technologies. Contrary to the advocates of GM technology, they are also concerned with the socioeconomic context of the farmers' situation. These witnesses plead for a rejection because they feared that GMO's would decrease farmers' degree of choice and control. The connotation these witnesses made to the alternative scenario, that is, organic farming, as a something more 'natural' and ecological friendly solution, implicit suggest that there is something 'unnatural', or environmental harmful in the opposite scenario, that is, GMO's. Whether this argument was conveyed is hard to say, but the comments a juror made, comparing GMO's to test tube babies may suggest so;

"I don't believe in this sandalwood biotechnology described by Dr. Sita (representative from the governmental research office on biotechnology). A baby born from a mother's womb is healthier and stronger than a test tube baby. In the same way this new sandalwood tree is not born out of a seed, but is generated artificially from a root or something else. Then it's brought from somewhere far away to our land. It cannot be good. A plant born out of a natural seed is bound to be healthier." (Ibiden)

In the end, there were no final agreements around whether the demonstrated facts really proved the benefits and/or the risks with GMO's. Hence, the jury had to decide what arguments should count most. One of the reasons why the farmers chose to reject GMO's may lie in their past experiences with technology and agricultural multinationals. The farmer's negative experiences from the 'Green Revolution' were often used as an analogy to express the farmers concern with the new GM technology. The farmers mainly focused on what for them had been an increased insecurity of their livelihood caused by the introduction of new varieties as part of the 'Green Revolution'. They were worried that GM crops could make them vulnerable again. As one juror explained;

"When the Green Revolution came you said it was a safe technology. But soon we had pollution. Now you say biotechnology is best. How can we make sure that after 10 years it will not backfire in a similar way, and we will again be victims?" (Ibiden)

This earlier negative experience with transferred science and technology, and the lack of insurance from the industrial actor, may in the end have been the cause for the majority rejection, despite any concrete evidences against the claimed benefits of GMO's. The farmers hence rejected GMO's, at least as they had learnt to know it through the trial, and compared to an alternative trajectory. This rejection was not total. After the verdict was given the jury put together a list of demands for improvements of the technology itself, and demands for the companies' policies of diffusion and responsibility towards their products.

As my informant with *ActionAid* told me, the trial also had other strategic interests in relation to the organizations "Food Rights Campaign". Even though my informant considered participation as a crucial aspect of empowerment, he also warned that participation should not be seen as a cure for everything. The informant thus recognized the citizen's trial as 'tokenistic':

"It is important not to rely our whole campaign on this one hand; it is just a complementary part of the strategy, even though we recognize that it has no legal bindings, or direct influence on policy making, it is a token that can be implemented in our campaigning and lobby activities." (Informant 6)

Despite this recognition of the trial as a symbolic contribution to the GMO's debate, its significance should not be underrated. Even though the court was adjourned after four days, this did not mean that *ActionAid* considered the case to be closed. I will show how *ActionAid*, and also other organisations and agencies within development cooperation have taken the results of the trial and brought it out to the global GMO's debate. For that, I will turn to the Reflexive level of this case.

4.5 Reflexive Level

What can be noted by *ActionAid*'s strategic use of the "Citizens trial", is that the organisations uses the case differently on two outward levels. On the one hand, the trial has been analysed by academic affiliates. In these reports the use of the court design for participatory technology assessment has been in focus. In these publications, the trial was depicted as more than just a simple yes or no to GMO's. The learning process, the stakeholder dialogue, and the compiled report produced by the jury, containing recommendations for future development of

technology and policies, has the lead role. Contrary to a “yes/no” (antagonistic) confrontation, and despite two outspoken presentations for and against GMO's, the process was narrated as with an atmosphere of constructive criticism.

The other aspect of the reflexive level is the strategic use of the jury's verdict in media and global debates. The results of the jury had a significant impact in global media and lobbying arenas. The trial was recognized by the UNDP in their human development report 2001, as a good example for creating debate and involving the public in technology assessment. The UNDP acknowledge these types of initiative as:

“...essential if the views of the farmers and consumers in developing countries are to influence the national policy making and bring more diverse voices to the global debates on food security” (UNDP, 2001p.75).

However, the process has so far not been conducted over a long enough time-scale to bring pressure on national and state governments, donors and corporations that are significant forces in the lives of India's rural poor. But the court design has been replicated in other parts of India, by other development agencies as the *Deccan development society*. *ActionAid's* Brazilian branch has also launched a series of juries covering the same issue. What may have been lost though is the stakeholder dialogue intended from the trial. In the Brazilian replications, *Monsanto* declined to participate.

When I talked to Devinder Sharma about the “Citizens trial”, he meant they are important for the local communities as stimuli of debate, and not at least, for spread of information among the Indian farmers. These cases can also become important platforms for farmers to deliberate and take a stand against the biotechnological industry. And they are important signals for the policymakers, NGO's and researchers in the North. But in his opinion, to have an impact, one will need thirty of them trials, not three. For him this should be a priority area for NGO's in the area of development.

This potential to participate in decision-making that was explored in the farmers' jury, and getting informed through open processes, is however not a part of state policy. This point is also highlighted by the UNDP, which calls for greater state engagement in stimulating farmers' participation in agricultural technology assessment and decision-making (UNDP, 2001). Devinder Sharma meant that it was naïve to think that policy-makers would empower

the local farmers, for that, the ties between the government and the industry, are too strong. For him, and his network of activists (AGBIO India);

“...the only way to get them to listen is to build up public opinion. That is what we are trying to do in our country, from the farmers level, from the grassroot level, from the civil society level and build up pressure from the outside, so that they (government) have no way to escape.” (Informant 5)

The use of the citizen's jury's rejection of GMO's has also been implemented strategically in *ActionAid's* campaigning activities. They realize that though this trial has no legally binding force, and does not directly influence policy-making, it is a valuable token in the global debate over GMO's. As explained;

“The major goal of each campaign lies not in its stated objective, but in generating a maximum amount of public attention. ActionAid's campaign is not aimed at generating money for the organisation, but at raising the public's awareness of the impact of introduction of GMO's and patent laws, both in developed and developing nations. But key proponents of our “Food Rights Campaign”, too, admit that its real target is public sentiment” (Informant 6).

4.7 Concluding Remarks

The Citizens trial did not have any direct policy implications. Some of my informants have suggested that this is because the government are essentially more concerned with its relation to the biotech industry, than the interests of the poor farmers. If this is the case, then it becomes important that at once citizens' juries reach their conclusions it is essential that appropriate intermediary individuals and channels exist to act between the jury and those with the power to create change. NGOs, federations of farmers' organisations and consumer organisations could have a role to play as they can use the findings of the juries for their campaigns and lobbying activities. As pointed out by Devinder Sharma, his network of social activists has taken consequences of the conceived lack of receptiveness by the governmental agencies, and the policy makers. They are now directing their initiatives towards the international political community, or towards shaping public opinion, hence trying to add pressure from a multitude of sources, not only the grassroot level. This was also the strategy of *ActionAid*, as they directed effort in conducting the trial, but also into the advocacy that followed the jury's verdict. This effort attracted attention to the food security issue, and how it was coupled to the over all production system. It also attracted attention to farmers' participatory ability in the assessment of complex technological issues.

The voices of small and marginal farmers can enter the policy process when appropriate methodologies are used. For example, putting the perceptions, priorities and judgement of ordinary farmers at centre stage, conducting the events in a rural setting: under a tamarind tree on a farm. Having government bureaucrats, scientists and other expert witnesses travel to farmers in order to present evidence on the pros and cons of new technologies means taking their policy futures and visions of food and farming as starting points. Donors, and the 'think tanks' they rely on, need to experiment more with initiatives such as those described here and re-orient their theory and practice accordingly. The jury outcome might encourage more public deliberation and pluralism in the framing and implementation of policies on poverty, food and agriculture in India, thus contributing to democratic governance.

5.0 Concluding Chapter

5.1 Meanings of GMO's

What can we conclude about the meanings given GM technology based on the discussions in the two assessments? What did the promoters advocate, and what did the opponents attack? Was there any stabilisation on the image of GMO's potential role for food security?

As we have seen in the “Southernvoices” conference we have to turn to social structures to trace the participants’ narrated meanings of GMO's. The evaluations were based on the myriad of social and natural conditions and requirements that faces the food insecure population. GMO's, thus, got their meanings by their relation to the global patent regime, the regulations of risks, alternative trajectories and capacity building programs. Likewise, the citizen’s trial case translated the meaning of GMO's according to the potential effects it would have for the jurors. Would GMO's provide them with more safety in regard to their harvest, where the products designed to meet their needs and how would GMO's affect their local environment?

My observations support the argument given by various STS scholars. Mackenzie and Wajcman (MacKenzie and Wajcman, 1999), for instance, explain the shaping of technology as an interactive process. Technology is shaped by social factors, and technology is in turn generating social consequences. Therefore it is necessary to account for the social situation to understand how technology gets different shaping and different consequences in different contexts. Thus, in the STS tradition it is considered important to account for the local capacity for adoption of a technology, and the cultural varieties, since the introduction of a technology into a different social context may cause unwanted, unpredictable effects. Technology and the social can, thus, not be seen as two separate entities. Hence, we are dealing with the hybrid

technological culture. This implies that the constellations of actors and interests affect potential choices and consequences of an introduction of GMO's. Thus, the stabilization of an artefact is a social process, subject to choices, interests value judgments – in short politics.

Technology is not necessarily used to achieve specific social change. Changing technologies or initiating new ones involves a period of instability, and provide *possibilities* for social change, but desirable changes have to be initiated and negotiated by human actions, this illustrates the political nature of technology. This further illustrates the importance of the rejection of technological determinism. A technological deterministic view does not stimulate citizen's participation in processes of democratic control of technology, since it conveys an image of autonomy and the impossibility of intervention. This change orientation stresses the potential tool technology may be to achieve social goals and the need for open debates on the desirable goals for the implementation of GMO's (Ibiden).

5.2 Problem-induced approaches

By opting for a problem-induced approach, the two cases managed to illuminate the complexity of the issues at stake and the many social factors involved in the shaping of GM technology.

A general conclusion for both cases is that it was not technology *per se* that was under attack. A social problem was the starting point, and GMO's were seen in the light of their relevance to the concrete problem of food insecurity. The aim was then to investigate the potential role of GM technology as a solution. The agendas of the assessments emphasized an ambivalent attitude towards the role of GM technology in development cooperation. Alternative technological trajectories were discussed. In the "Citizen's trial" through a comparative scenario approach. At the "Southernvoices" conference options in food production were up for discussion, especially organic farming was advocated as an alternative trajectory. The assessments further emphasized the complexity of the GMO's introduction. GMO's were defined through their consequences in particular social contexts. Hence, GMO's relation to overall production systems and the cultural variations of receiving local communities further strengthened the problem-induced character of the assessments.

Within this common frame there was still room for conflicts and disagreement among the participants. Different actors have given GMO's different meanings according to the contextual circumstances, and the actors' value system. The assessments therefore facilitated what van den Daele called "an arena for for social conflict". In addition we need to ask whether the facilitators of the assessments managed to create common ground for constructive argumentation and substantiate conclusions without compromising the complexity of the participation and issues at stake.

5.3 "Southernvoices" – Trading Clear Answers for Complexity

The "Southernvoices" conference was the case that most clearly demonstrated the inherent complexity of the GMO's issue. It was also the case that to the least extent managed to come up with clear-cut answers to the role of GMO's for food security and consequently contribute to its objectives of policy change. The conference had difficulties of gaining political influence in the wider context of the Terlouw debate, and the decision making within the Dutch parliament.

To explain this drawback, I will turn to the interplay between assessment approach, framing and steering. As I have gone through the conference transcript, and conducted interview with the involved parties it is striking to see how few references are made to scientific reports, facts and technicalities often found in debates over GMO's. When GMO's are only defined through the context they occur in, whether natural conditions or social structure, and the participation constitutes a myriad of natural and cultural idiosyncrasies, then reaching a conclusion on the definition of the technology, and the consequent suggestions for regulating it may prove impossible. As with the lack of agreements or debates around the definition and empirical material surrounding GM technology, the conference did not focus on already existing Dutch policies on GMO's and development cooperation. Implementing an open agenda structure and a complex problem approach may stimulate a broad participation. But to intend an 'idea mining', where the variety of voices is given prominence involves a major trade off. A trade-off in the sense that it was difficult to draw conclusions and come up with concrete policy suggestions. The conference had no procedures or criteria for decision-making.

In the conceptual framework it was explicitly pointed out that a problem-induced approach could not be a substitute for a technology-induced approach (Van den Daele, 1997). The latter should always be implied in the former and a precondition for it. Though facts are disputable and may involve values they are also providing a frame for what is possible, and limits for discussions of complex problems. Thus, they are also comforting and necessary if rationale argumentation is to take place.

In a discussion where one intends to avoid confrontation among stakeholder groups, where idea mining and diversity of opinions are the valued elements instead of solutions and priorities, we are faced with the problem addressed in the conceptual framework where participation and deliberation becomes a goal in itself, not a mean for reaching solutions to the given problem. Except from the suggestion of a "Bionux" as an alternative to private patenting, there were few concrete policy suggestions generated from the conference. The over-all lack of conclusions and suggestions did not make the process of absorbing the results of the conference at the next level easy. But the politicians and the scientific community must take its share of responsibility for this failure, allowing the "Southernvoices" conference to become a 'rubber stamp' case, in terms of policy influence.

5.4 "Citizens Trial" – Trading Complexity for Clear Answers

In the "citizen's trial" the participants did not reach an agreement on the potential consequences of GMO's. Instead, the inherent elements of uncertainty lead the jurors to reject GM technology.

As we have seen in the analysis of this case, it was considered of importance for *ActionAid* to attain a token from the poor that could be used in their global campaigning activities. Though this strategic grip, *ActionAid*'s perspective-making would be fuelled. They could strengthen their image as a NGO representing the poor. Their narrative on GMO's, is not an absolute rejection, rather they emphasize that the poor themselves should have a choice, and that they should avoid being forced into a technological trajectory due to the overbuilding power structure, as the global trade system. Through attaining a 'No' verdict, *ActionAid* could potentially strengthen this narrative, and emphasize their perspective-making. They were now able to verify they profiled image of acting on behalf of the poor, not just

because they claimed so, the poor themselves had verified their position towards GMO's. As my informant with *Greenpeace* put it;

“When someone from Bolivia says something it is more powerful, it is more authentic. You can see the story yourself from a tape, instead of having someone from Greenpeace in the Netherlands to say these things”. (Informant 3)

We have seen how the design of a “Citizen’s trial” may enable people with no prior knowledge to judge in technical matters. On the other hand, the conceptual framework pointed out that the risk is that complex issues are reduced to ‘yes / no’ verdicts, in order to be able to generate a concrete result. Through use of seemingly contradicting scenarios as a basis for decision-making, and the antagonistic approach of a jury set-up, with a prosecuting and defending side, the outcome of the trial was bound to produce a clear answer.

What was lost within this framing was a discussion over a complementary agricultural trajectory. By framing the GMO's issue as a case of conflict between industrial interests and local production another element got away. The potential role of intergovernmental agencies in the development and diffusion of genetically modified organisms could bypass the profit interest problem that industrial interests presented for the jurors. Due to the framing, where an absolutely security and insurance for harvest was required before the jury would accept genetically modified organisms, another answer than ‘No’ is less conceivable. The jury argued that it was not enough to consider risks which can be described and tested. The real issue with transgenic plants might well be that we do not know the risks. However, in conventional plant breeding, or in organic farming, too one can neither foresee nor control what the physiological impact of new genes might be, given the genetic background of the host plant. Unexpected and undesirable side-effects are abundant and must be coped with through testing and selection in the further development of new varieties. Accompanying the jury’s verdict, the report made in the aftermath of the trial also took this into account.

5.5 Participatory Technology Assessments and Decision-making

It should be apparent that a full reversal of the burden of proof is not an operational rule. The unsubstantiated assumption that there may be unknown risks can easily be raised against any

new technology and can hardly be refuted. No innovation would survive under such a rule (Van den daele, 2002). But through the use of participatory technology assessments one can ensure that the views of a broad spectrum of social groups are included in the evaluation of costs and benefits of technology deployment. Hence, ensuring that principles of equity are accounted for when potential policy interventions are assessed.

Both assessments focused on the socioeconomic and sociopolitical framework of GMO's. The results of the two assessments were in the one case negative and in the other at the least critical towards implementing GMO's as a tool for human development. The basis of these attitudes was not mainly concerned with risks prevention. Rather the focus of the arguments was on reform of political and economic institutions and the future development of society. The real issue behind the conflicts surrounding GMO's, thus seems to be the quest for democratic and equitable control of the process of technological innovation. When risk arguments no longer play the central role, it seems more legitimate to apply majority decisions in the choice of conflicting goals.

Participatory approaches were mainly institutionalized as a reaction to the narrow framing of expert arrangements. The underlying rationality is that we need to include the interacting social aspects of technology deployment in the evaluation and decision-making process of technology introduction. Hence, as advocated by the STS tradition avoiding 'black-boxing' the social forces shaping of technology. On the other hand, the dominant view of technology was still reinforced in the assessments; it implied that an evaluation could be conducted by singling out the social aspects without putting the technology itself under scrutiny.

The empirical findings of my cases may support the conclusion of Van den Daelen (Ibiden), that, perhaps the optimum would be to pursue the different approaches in parallel or in cooperation. Problem-induced arrangements need to build a common ground in regard to the technological definitions, possibilities and restraints. The assessment should be clearly framed with affected parties included. The steering needs to direct the discussions and limit the issues at stake so that the evaluation avoids falling in the trap of relativism. If not, the generated answers to the problems at hand result in as many answers as participants. Hence, the only objective fulfilled is participation itself, not conclusions that can be translated into policies.

5.6 Participatory Technology Assessments as Arenas for Social Learning

Despite the illuminated trade-offs, we should not conclude that they are insignificant. Among the participants of both events the aspect of social learning was often mentioned as a particularly important factor in their evaluation of the assessments.

In the “Citizen’s trial”, although the jurors knew that this would be simulated court case, without any legal effect, they expressed the ability to gain knowledge as a reason for participating. As one of the jurors commented after the trial;

“I came here to find out what biotechnology was all about. I had plenty to do in my village but I wanted to come here. Now I know what biotechnology is.” (Trial transcript)

The learning process was also multi-directory. For the developer of GMO's and for the government representatives, this was an opportunity to acquire knowledge about the farmers' practises, their problems, needs and demands. The citizens trial therefore could give these stakeholder groups vital information on what priorities had to be set if their GM crops should become an important, and for the farmers, acceptable tool for poverty eradication. In regard to the government representatives the jury are also seen to bare the potential of symbolic value in that they show how 14 jurors can regain control over knowledge and be empowered to make recommendations to governments

In the case of the “Southernvoices” conference the participants recognized it as a platform for social learning and exchange of arguments and on GMO's and international development cooperation in general. Also it was considered an important platform for bringing the perspectives of developing countries to northern scientists and activists.

As one of my informants said;

“I think the “Southernvoices” was a wonderful initiative, it did bring the southern perspective to the western arena. Universities and academic institutes can learn and try to grasp what is going on in the South, what needs to be done in the There you have the voices of the South, delivered right at the fruit table of the people that matters in the academic, or in the ordinary body that is very influential for policy making” (informant 5).

Participatory technology assessments are not a procedural fix to resolve political conflicts over technological innovation. They may provide a forum for rational discourse in which

controversial arguments will not only be exchanged but also examined. Such discourse implies learning. However, the learning may, or may not be accepted and adopted by the participants and the observing public. The representatives of the parties of the political conflict may refuse to adapt to what has been learned, as we saw in the case of *Monsanto*, who dismissed the claims of the jurors of the “Citizen’s trial” as unrealistic. Or as in the case of the “Southernvoices” conference, when negotiations on political parties positions were negotiated before the results of the Terlouw debate were presented.

Participatory technology assessments constitute a limited context of cooperation and it operates at a distance from the real political arena. It remains what van den Daele calls; “*a small island of argumentation in a large sea of strategic battle*” (Ibiden). Thus, in terms of ‘realpolitik’ it must be expected that arguments that have been refuted within the technology assessment will continue to be used outside the technology assessment, as long as they can still impress the public. Even though, participatory technology assessments may be a valuable contribution to the political culture decisions will still have to be taken in dissent. However, procedures that give the critics a fair chance to present alternative frames and submit controversial issues to the discipline of rational argumentation will contribute to the legitimacy of decision-making in dissent.

5.7 Conclusions and Suggestions for further Research

Different participatory and empowerment approaches are useful for different tasks. Some may be good at gaining insights into the broad range stakeholder perceptions; others may be effective at highlighting underlying framing assumptions and values; others may be appropriate in developing scenarios of future options, setting choices in a wider contexts; others may be useful at encouraging the development of consensus and moving towards decisions, social learning and stakeholder dialogue are potential benefits with these institutions. Combinations, hybrids and sequences of methods may be required if the ranges of challenges raised by biotechnology policy processes are to be addressed. The general conclusion is that methods by themselves, of course, do not necessarily result in inclusive participation and effective deliberation in complex policy processes. They must be attuned to particular contexts and adapted to particular needs and circumstances. The five levels elaborated upon in this thesis, organisation, technology, steering, narrative and reflexive, may be helpful tools for planning and evaluating participatory technology assessment initiatives.

Clearly, a research based on two cases is far too limited to draw any general conclusions on participatory technology assessments strengths and weaknesses. Nevertheless, what I have tried to show in this thesis is that it is possible to conceptualise these institutions. Despite the variety of forms and functions they take, it is also possible to develop a common analytical framework to improve our understanding of these social innovations within the area of technology studies. More empirical studies of different approaches and theoretical discussion is required though. Based on this thesis I would like to point to some factors that may prove interesting for further research within this topic:

- What approaches are suited for different tasks - by issue, by location, by element of the policy process?
- How can different approaches be combined, and sequenced, as part of an ongoing process?
- How is inclusion and representation addressed, particularly in the context of the globally unbalanced development and diffusion of GM technology?
- How are regional power relations and systematic social differences addressed as part of deliberative processes?

- How can such approaches be linked to other elements of the policy process, representative decision-making etc.?
- How compatible are such approaches with existing formal and informal approaches to decision-making?
- What approaches are feasible (politically, logistically, financially etc.) in particular settings?

Literature List

- Allan, T. and (2001) *Poverty and Development into the 21st Century*
Thomas, A. Oxford University Press, Oxford, UK
- Arquilla, J. (2001) *Networks, Netwars, and the Fight for the Future*
and Ronfeldt, D. First Monday, volume 6, number 10
URL:http://firstmonday.org/issues/issue6_10/ronfeldt/index.html
- Asdal and (2001) *Teknovitenskapelige kulturer*, Spartacus Oslo, Norway
Brenna Moser (red.)
- Bauer, M., (1998) *Biotechnology in the Public Sphere*, Science Museum, London, UK
Durant, J and
Gaskell, G. (ed)
- Bijker, W.E. (1987) *The Social Construction of Technological Systems*,
Hughes T.P. New Directions in the Sociology and History of Technology,,: MIT
and Pinch T Press, Cambridge MA, USA
- Bijker, W. E. (1995) *Of Bicycles, Bakelites and Bulbs. Toward a Theory of Sociotechnical Change.*: MIT Press. Cambridge, MA, USA
- Bijker, W. E. (2001) *Social Construction of Technology*. In N. J. Smelser & P. B. Baltes (Eds), *International Encyclopaedia of the Social & Behavioral Sciences*, Oxford Press, Amsterdam, etc.: Elsevier Science Ltd.
- Boer, L. (2001) *Technology and development: a case of schizophrenia*
Third World Quartley, Vol 22, No 5, Carfax publishing, UK
- Bunders, J. (1996) *Biotechnology – Building on farmers` knowledge*
Haverkort, B. Macmillian Educaytion ltd, London, UK
Hiemstra, W.
- Castell, M. (1996) *The Rise of the Network Society*, Blackwell Publishers Oxford, UK

- Eike, M. (2000) *GM Food: Controversy and Uncertainty.*
Paper for the 3. POSTI International Conference,
London, UK
- Elster, J. (1992) *Arguing and Bargaining on Strategic Use of Communicative Behavior."*
(In Norwegian) *Tidsskrift for Samfunnsforskning* (1992), 33(2):115-
132.
- Eriksen (1999) *Technology Assessment in a Deliberative Perspective*
and Olsen In Schomberg, R. *Democratising Technology –*
Theory and Practice of a Deliberative Technology Policy
International Centre for Human and Public Affairs, Hengelo,
the Netherlands
- Haraway, D. (1995) *In, Situerte kunnskaper: Vitenskapsspørsmålet i feminismen og det*
Asdal, Brenna, *partielle perspektivets forrang*
Moser and Refseth
(Eds.)
- Haraway, D. (1997) *Modest Witness@Second Millennium FemaleMan Meets Onco Mouse*
TM: Routledge, New York, USA
- Javier, Q. E. (1996) *The Globalisation of Science – the Place of Agricultural Research*
Bonte-Friedheim, C. International Service for National Agricultural Research, den Haag,
and Sheridan, K (Ed) the, Netherlands
- Kleinman, D.L.(2000) *Science Technology and Democracy*
State Univesity of New York Press, New York, USA
- Komen, J. (1993) *Agricultural biotechnology in developing countries: a cross country*
and Persley, G. *review, Research Report no.2. Intermediary biotechnology service,*
ISNAR, den Haag, the Netherlands

- Kumar, N (1997) *Technology Market Structures and Internationalisation: issues and policies for developing countries* UNU/INTECH studies in new technology and development, Routledge, London, UK
- and Siddarthan, N.
- Latour, B. (1986) *Laboratory Life: The Construction of Scientific Facts.*
and Woolgar, S. Princeton University Press, Princeton, USA
- Levidow, L. (2001) Science and governance in Europe: lessons from the case
and Marris, C. of agricultural biotechnology in *Science and Public Policy* Vol. 28,
nr. 5 2001, Beech Tree Publishing, Surrey, UK
- Liberatore, A. (2001) *Broadening and enriching the public debate on European matters*
White paper on Governance, European Commission, Brussels,
Belgium
- Lipschutz, R. (1996) *Global Civil Society and Global Environmental Governance: The Politics of Nature from Place to Planet.* Albany: SUNY Press, USA
- MacKenzie (1999) *The Social Shaping of Technology*
And Wajcman (Eds) Milton Keynes, Open University Press, USA
- Merchant, C. (1980) *The Death of Nature. Women, Ecology and the Scientific Revolution.*
San Francisco: Harper and Row, USA
- Mesman, J. (2002) Lecture given ESST, Maastricht University, Maastricht,
the Netherlands
- Moser, I. and (1992) *Biopolitics – A Feminist and Ecological Reader on Biotechnology*
Shiva, V. (eds.) Zed Books Ltd, London, UK
- Sukopp, H. (1997) *Transgenic Herbicide-Resistant Crops: A participatory*
Puhler, A and *Technology Assessment.* Summary Report. Social Science
Van den daele, W. research Centre, Berlin, Germany

- Terlouw (2001) Commission *Genes on the Menu: a Public Debate on Biotechnology and Food*, den Haag, the Netherlands
- TNU (2001) “*Southernvoices*”, the Network University, Amsterdam, the Netherlands
- Todt, O. (2002) *Managing Uncertainty and Public Trust in Technology Policy*
<http://www.jrc.es/pages/iptsreport/vol43/english/MET1E436.htm>
- UNDP (2001): Human Development Report “*Making new technologies work For Human Development*”, Oxford University Press, New York, USA
- UNU/INTECH (2002) *Agricultural Biotechnology*, in Technology Policy Briefs, vol.1, issue 2, 2002. The United Nations University, Institute for New Technologies, Maastricht, the Netherlands
- Wakeford, T. (2000) *ActionAid Citizen`s jury initiative – Indian farmers judge GM Crops*, ActionAid, London, UK
- Wilde, d R. (1997) *Sublime futures in Technology and Democracy*
 Senter for teknologi og menneskelige verdier,
 University of Oslo, Norway

Internet Sources

<http://binas.unido.org/binas/>
<http://www.agbioindia.org/>
<http://www.scidev.org/>
<http://www.monsanto.com/monsanto/layout/default.asp>
<http://www.greenpeace.org/homepage/>
<http://www.southernvoices.nl/>
<http://www.actionaid.org/>
<http://www.rafi.org/>

Appendix

Preparatory Informants

United Nations Development Programme, Nordic Office, Oslo, Norway

Internaitonal Service for National Agricultural Research, den Haag, the Netherlands

Informants

Informant 1: Theo van der Sande
Ministry of Foreign Affairs
den Haag, the Netherlands

Informant 2: Prof. Dr. Louk de la Rive Box
Terlouw Commission Member
Maastricht, the Netherlands

Informant 3: Hinse Bonstra
Greenpeace
Amsterdam, the Netherlands

Informant 4: Lara van Druten
The Network University
Amsterdam, the Netherlands

Informant 5: Dr. Devinder Sharma
AgBio India
New Dehli, India

Informant 6: Alex Wijeratna
ActionAid
London, United Kingdom