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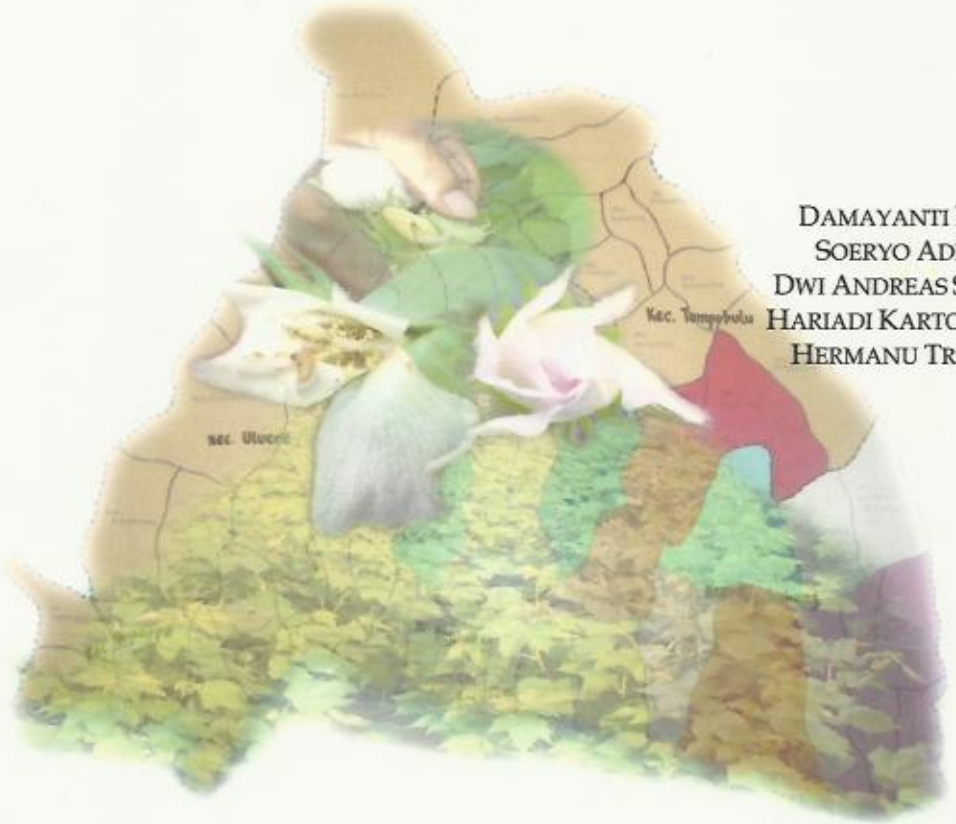
PUBLIC PARTICIPATION ON DEVELOPMENT OF BIOTECHNOLOGY POLICY IN INDONESIA: *CHALLENGES, OBSTACLES, AND OPPORTUNITIES*



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A REPORT

TO WRI CASE STUDY PROJECT:

Capacity Building for Best Practices in Biotechnology Policy for Asia:
Implementing Mechanism for Public Participation in Biotechnology Decisions

EXECUTIVE SUMMARY

This report reflects on the challenges, obstacles, and opportunities associated with implementing public participation in decision making of biotechnology in Indonesia. It suggests some different ways of understanding and encouraging participation, draws lesson from experiences, and proposes a set of critical challenges, obstacles, and opportunities for those thinking about how to promote more effective public engagement in processes of biotechnology decision making. This report focuses on particular issues in Indonesia, e.g. national policies on biosafety and the room for public participation in influencing the process. Special focus was put forth in the analysis of the controversial Bt cotton in South Sulawesi.

In 16 August 2004 Indonesia ratified the Cartagena Protocol through the approval of the House of Representative. As a consequence, the Government of Indonesia should promote, facilitate and consult the public in the decision-making process regarding GMOs. This is in accordance with Article 23 that requires that countries should "promote and facilitate public awareness, education and participation concerning the safe transfer, handling and use of living modified organisms" and "endeavour to ensure that public awareness and education encompass access to information." The public, however, is still not yet well informed about many of the issues related to biotechnology. The public at large even seems to be quite unaware with respect to the presence of transgenic product in their daily lives. Further analysis showed that the low public perception and knowledge in biotechnology product and policy are strongly related to the low public participation in almost every level of biotechnology establishment in Indonesia.

Indonesia has developed policies related to transgenic product, e.g in Law No. 7/1996 about Food in Article 51 and 52. This was then further implemented in the development of Government Regulation No. 69/99 on Food Labelling and advertising. Specifically this Regulation states that it is mandatory that transgenic products have to be labelled. In Ministerial Decree No 17/2001 it is also stated that all transgenic plants should undergo EIA process. Biosafety Assessment for release was further regulated through The Joint Four Ministerial Degree 1999 which is now has been replaced by Government Regulation no 21/2005. The drafting process of the Regulation has sparked some controversies, which then initiate some members of the public (the coalition of NGO) to develop a draft of the Law on Biosafety and Foodsafety on GMO as a further step of implementing the Cartagena Protocol.

In this study we define public participation on the development of biotechnology policy as a process through which stakeholders -in particular users of GM products and indirectly affected groups or pressure groups- influence and share control over policy and decision making on GM product. This study focus on two sphere of participation: first, the involvement of public in development of laws, policies and other legally binding rules with respect to biotechnology issue; second, participation of public in decisions on specific activities of biosafety and food safety matters such as permits and licenses. Then, we examine to what extent and in what way the public has participated in the development of biotechnology policies and regulations. Furthermore, we depict how far and what kind of public participation has been involved in the assessment and issuance of permit or license of GM product with respect to *Bt* Cotton case in South Sulawesi.

What happens in Indonesia in the arena of public participation is always a mixture of international obligation, national initiative and domestic demands. This paper aims to encompass these different influences from different stakeholders. The paper contains the following Chapters:

- *Chapter One* discusses the initiation of biotechnology development in Indonesia and scope for public participation in biosafety governance.
- *Chapter Two* discusses the framework and processes that were used in gathering information on public participation and reviews early lessons emerging from study case on Bt cotton in South Sulawesi.

- *Chapter Three* discusses the biotechnology research and development in Indonesia
- *Chapter Four* discusses the biotechnology products and existing policies in Indonesia associated with public participation
- *Chapter Five* discusses the type of public participation with respect to existing regulations of Biosafety in Indonesia, both at the national as well as local level, and actors involved.
- *Chapter Six* provides conclusions and recommendations for public participation in Indonesia based on its opportunities, challenges, and obstacles.

ACKNOWLEDGEMENT

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This report focuses on the process of development of biotechnology-related policies in Indonesia, with special emphasis on the participatory process involved. The obstacles, challenges and opportunities of designing policies through participatory process in the context of the social-political situation of the country are carefully discussed. Group discussions, field assessments, interviews and roundtable discussion were held at various points during the writing process to seek out in depth information.

Many people and institutions have contributed and assist us in the development of this report, to which we owe our deep gratitude. We extend our appreciation for their constant support and guidance.

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GLOSSARY

AIA	:	Advanced Informed Agreement
AMDAL	:	*Analisis Mengenai Dampak Lingkungan* (Environmental Impact Assessment, EIA)
Apekindo	:	Asosiasi Petani Kapas Indonesia (*Indonesian Cotton Farmer Association*)
BCT	:	Biosafety Containment Test
BFSTT	:	Biosafety and Food Safety Technical Team
RFT	:	Restricted Field Trials
CMR	:	Committee on Medical Research
DPR	:	*Dewan Perwakilan Rakyat* (House of Representative)
GEF	:	Global Environmental Facilities
GEAP	:	Genetically Engineered Agricultural Products
GMO	:	Genetically Modified Organism
HKTI	:	*Himpunan Kerukunan Tani Indonesia* (Indonesian Farmer's Neighbourhod Association)
ICEL	:	Indonesian Center for Environmental Law (NGO)
ITB	:	*Institut Teknologi Bandung* (Bandung Institute of Technology)
KEHATI	:	*Yayasan Keanekaragaman Hayati* (Indonesian Biodiversity Foundation)
KONPHALINDO	:	*Konsorsium Pelestarian Hutan dan Alam Indonesia* (Indonesian Consortium for the Forest and Nature Sustainability)
NBF	:	National Biosafety Framework
NBFSC	:	National Biosafety and Food Safety Commission
OECD	:	Organization for Economic Cooperation and Development
PAU Bioteknologi IPB	:	*Pusat Antar Universitas untuk Bioteknologi, Institut Pertanian Bogor* (Inter University Center of Biotechnology, Bogor Agricultural Institute)
PBPI	:	*Perhimpunan Bioteknologi Pertanian Indonesia* (The Indonesian Association for Agriculture Biotechnology)
PIPI	:	*Perhimpunan Ilmu Pemuliaan Indonesia* (Indonesian Breeder Association)
PP	:	*Peraturan Pemerintah* (Government Regulation)
RPP	:	*Rancangan Peraturan Pemerintah* (Draft of Government Regulation)
RUU	:	*Rancangan Undang – Undang* (*Draft of Law*)
SLPHT	:	*Sekolah Lapang Pengendalian Hama Terpadu* (Farmer's Field School for Integrated Pest Management)
TNC	:	Trans National Corporations
UGM	:	*Universitas Gajah Mada* (Gajah Mada University)
UI	:	*Universitas Indonesia* (University of Indonesia)
UNEP	:	United Nation Environment Program
UNHAS	:	Universitas Hassanudin (University of Hassanudin)
UU	:	*Undang – Undang* (Law)
YLKI	:	*Yayasan Lembaga Konsumen Indonesia* (Indonesian Consumer Institute Foundation)
YPR	:	*Yayasan Pendidikan Rakyat* (People Education Foundation)

I. INTRODUCTION

Biotechnology is recognized as the fastest growing science and technology in the last three decades. Biotechnology influences the development of technology in many areas, i.e. medicine, agriculture, industry, and environment. In the area of medicine and human health, the new technology has been applied for development of new vaccines and drugs, new method for diseases detection, analysis of human genome, molecular forensic analysis, gene therapy, development of animal organs for transplantation (xenotransplantation), therapeutic, and reproductive cloning.

Modern biotechnology has also been used for development of plants where its genome has been modified through insertion of foreign gene(s) (i.e., transgenic[1] plants). In the last decade, transgenic plants has been growing worldwide at the area of almost 60 million hectare in 2002 (James, 2003). With the current development of transgenic plants, it is expected that in five years, 60% of the world's four most important plants (soybean, corn, canola, and cotton) will be transgenic (Santosa, 2002). Most of commercial transgenic plants are developed and owned by multinational corporations under international patent regime.

Since its initial development in 1985, transgenic, which has been hailed by many as a new technology to support food and agricultural system, has created contradictions and challenges among groups and people who are either directly or indirectly affected by the technology. Much of these controversies stems from control of the seeds and food supply by industries (Smith, 2003), safety issues (health and ecological), cost and benefits, as well as issues related to economic, social and justice for farmers in the developing countries (Sahai, 2003).

[1]An organism containing genetic material artificially placed there from another organism by the technique of genetic modification.

There are generally two different groups that have differing opinions regarding the use of transgenic in the field. The first group, the advocates of transgenic technology, mainly view the technology from the economic or market aspect and argues vehemently about the safety of the product. These are the people who view transgenic as a key answer to combat hunger. The second group, meanwhile, is a group that consists of a diverse group of stakeholders who view the technology from an ecological, human health and social aspect. This latter group takes a more cautious stand in their view of transgenic technology. In this report we are using the term "advocates" and "cautious" groups to contrast the two groups. The word "cautious" is used in the sense to contrast the different group. It actually consists of groups of people who are not necessarily opposed to, but are practicing a more careful approach toward the new technology. Academicians, who can be regarded as the group that best knows about the risks and benefits of the technology are also divided into these two groups. This polarization of people into different groups also occurs in Indonesia.

The first transgenic plant being introduced in Indonesia is the Monsanto made cotton of the Bollgard variety, which essentially is Delta-Paint cotton variety that has been inserted with *Bt*[2] gene to confer resistance against bollworm. *Bt* cotton first came to the country in 1998, where several laboratory tests were conducted in Bogor. These tests were conducted by Balai Penelitian Bioteknologi dan Sumber Daya Genetik Pertanian-Research Center for Biotechnology and Genetical Resources (Bahagiawati *et. al.* 2003). *Bt* cotton was first planted in the field in a restricted field trial conducted by the

[2] So far, the only successful approach to engineering crops for insect tolerance has been the addition of the *Bt* toxins, a family of toxins originally derived from soil bacteria, *Bacillus thuringiensis*. These toxins are effective against a variety of economically important crop pests but pose no hazard to non-target organisms like mammals and fish. Two Bt crops are now commercially available: corn and cotton (James, 2002). Bt potato has been withdrawn from the market since 2002.

Commission on Biosafety and Foodsafety of Genetically Engineered Agricultural Product (NBFSC) in 1999. The result of this test was that *Bt* cotton is safe to be planted in the field, hence the follow up test (multi-location test) in 2000 (Trisyono *et al.*, 2001 a, b). There were many controversies that came about from the Bt cotton project implementation. One of the controversies that came out of *Bt* cotton is the fact that even though field tests were still conducted in the field by government-appointed researchers, farmers were already planting Bt cotton plants in their field. This situation leads to the fact that transgenic cotton were planted at a bigger scale than first projected or officially reported. The controversies then led to the dispute between Non Governmental Organizations (NGOs) and government/ Monsanto. One of the issues that were brought up by NGOs was that the public has not been fully informed about the risk of transgenic crops, and that the field tests conducted were not transparent enough. The government and Monsanto, meanwhile, argued that transparency has been done.

The situation in Indonesia clearly showed that the way of how transgenic plants was introduced raised many concerns among different member of the public. The Bt cotton Indonesia project offers opportunities to learn about participatory processes in policy/decision making for GM crops. It offers opportunities to learn about past mistakes and what should and could have been done to enhance national biosafety policy processes. Since this technology is new, and the adverse effect is not clear as of yet (in spite of many tests that has been conducted), it is very important for a country to practice precautionary approach as mandated by ratified Cartagena protocol on biosafety (Mackenzie *et al.*, 2003). It is precisely this reason that the public has the right to be informed of what this technology might bring. The rights of the public does not only encompass the risks and benefits, but also the ramifications of regulatory bodies and laws that has to be implemented to ensure fairness for consumers.

It is important to add, that the controversies between public and private-government are enabled because Indonesia in 1998 experienced the reformation period whereby the public has learnt more about transparency, accountability, and freedom of speech and in fact, started to practice it in their daily life. The transgenic cotton case in Indonesia is a classic example of how the public has become more aware of their role in decision making process (see Appendix 1), and therefore, this report will focus on the introduction of *Bt* cotton in Indonesia.

This project was designed to meet three main objectives, namely (1) to identify perception and position of each key actors in order to construct their map of interest and role in biotechnology; (2) to define public's point of view and their influences and involvement in biotechnology policy; and (3) to make a recommendation and alternative way of public participation mechanism.

II. THE FRAMEWORK AND METHODS OF STUDY

The Concept and Sphere of Public Participation

'Participation' is a rich concept that has different meanings to different people in different socio-economic, cultural and political situations. The term has been used to build local capacity and self-reliance, but also to justify the extension of control of the state, i.e., by using a public participation process to claim legitimacy for a decision that did not truly take into account results of participation. It has been used to devolve power and decision making away from external agencies, but also to justify external decisions. It has been used for data collection i.e. Participatory Rural Appraisal, as well as for interactive analysis, i.e. social assessment, gender analysis (Pretty *et. al.*, 1995). For some, it is a matter of principle; for others, a practice; and for still others, an end in itself.

In this study we do not use the "popular" term of participation, that is, participation of the poor and others who are disadvantaged in terms of wealth, education, ethnicity, or gender. When we analyze public participation in the development of biotechnology policy in Indonesia it is obvious that apart from the poor and disadvantaged group of people who were directly affected, a range of stakeholders that could affect the formulation of policy or affected by it are important and critical to analyze. Therefore, with regards to the purpose of this study, the term of 'participation' from World Bank Learning Group on Participatory Development, that is, *a process through which stakeholders influence and share control over development initiatives and the decisions and resources which affect them* (World Bank 1996), seems more appropriate for our study.

The Approach and Method of Study

In order to gather comprehensive data and information on public participation in development of biotechnology policy, studies were done at two different levels, the national and local levels. The flow of the study is depicted in Figure 1. The framework of study depicted in Figure 1 is implemented through the actor approach. In general, four types of actors examine in this study as follows:

- *Users*, that is, consumer or public at large who consume GM foods and farmers who use transgenic plants
- *Producers*, that is, organization who invent and/or produce genetically engineered product such as private company
- *Indirectly affected groups or pressure groups*, such as nongovernmental organizations (NGOs), journalist, scholars/ academicians as well as professional associations
- *The Government*, that is government agencies related to GM products affairs either at local (provincial or district) or national level.

Actors studied according to the above classification are depicted in Appendix 2.

At the national level, the study focused on identifying the actors involved – particularly the government, private company and NGOs, and mapping their political economic interests, position and power in influencing policy at the national level. The interest, position and power of each actor are analysed historically from content analysis and in-depth interview to several informants/actors. The source of data for content analysis is collected from news and articles publish in newspaper during January 2000 to 2004 (see Appendix 5), scholars writings in biotechnology (see Appendix 6), various meeting, workshop and discussions held by NGOs and other actors (see Appendix 7), and established policies and regulations.

The existing policies and regulations are examined in order to analyse the degree to which access to information and public consultation and reaction concerning the decision on GM product is provided. The content analysis of public participation in existing policies and regulations is an

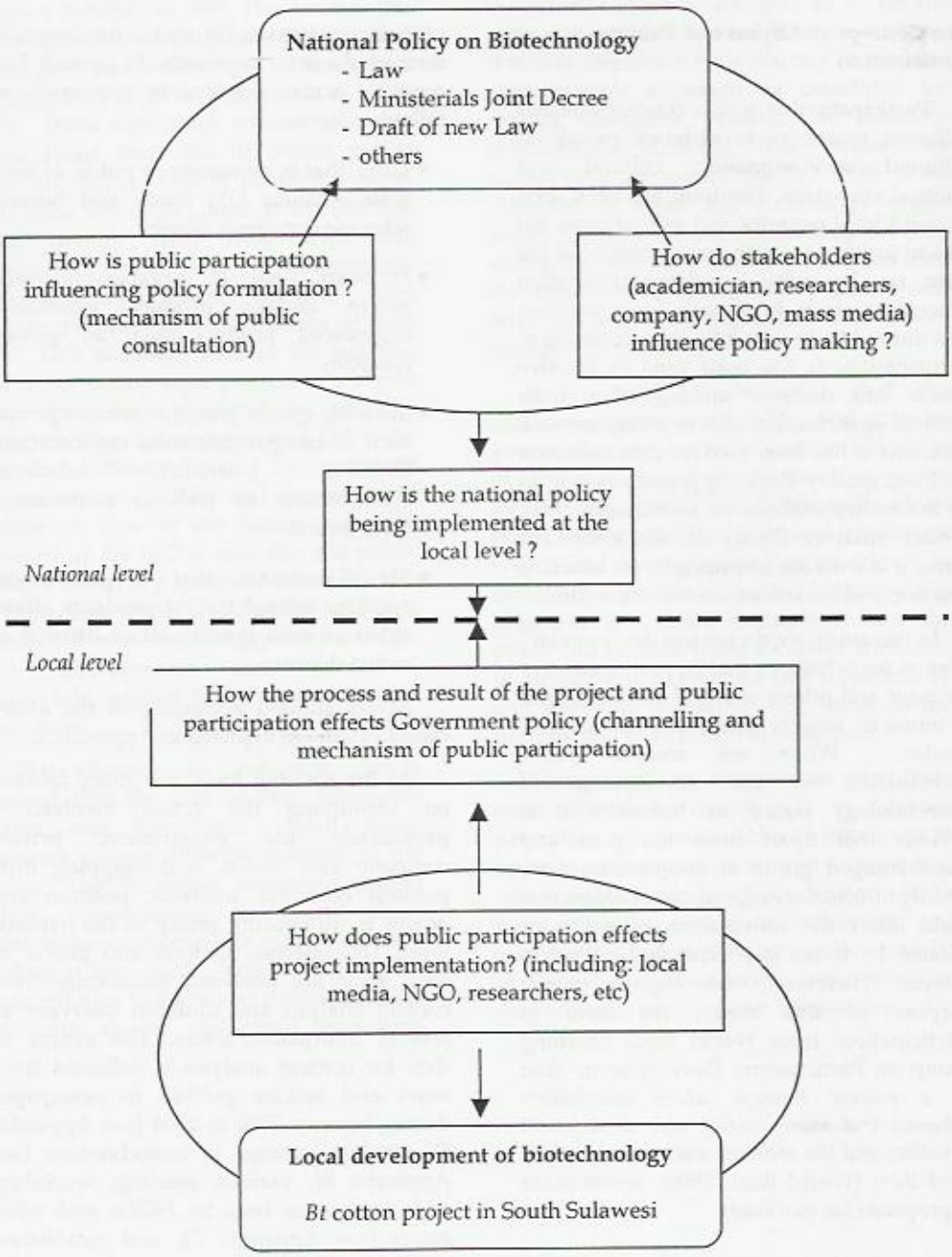


Figure 1.Flow of study of the implementing mechanism for public participation in biotechnology decisio

important one as the powerful actors may inscribe their interest in the written regulations. In-depth interview, thus, is conducted in order to enrich and validate the result of the content analyses.

The *Bt* cotton controversy in South Sulawesi Province, are examined in-depth as it could portray comprehensively the political and economic interest and power relations between various actors involved, within which, the public participation are framed and produced. In addition, the struggle of each actor to accept and refuse the *Bt* cotton was also examined. By combining the analysis at the national and local level, we could identify the obstacles, opportunities and challenge to enhance public participation in decision-making process for biotechnological development in Indonesia.

The study was conducted from January through May 2004. During the study, data were collected through triangulation methods i.e. the secondary data collection, in-depth interview and discussions, and field observation. Aside from that, focus group discussion and roundtable discussions were also conducted to obtain more deep information. Secondary data that were collected among others were government policies and regulations, official reports, publications, papers, and numerous news/articles of newspapers. Most of the secondary data particularly the newspaper's articles are interpretated through the content analyses. The in-depth interview was conducted using guidance questionnaires as depicted in Appendix 2.

III. STATE OF THE ARTS OF BIOTECHNOLOGY

Definition and Scope

Biotechnology at its simplest can consist of familiar activity as production of fermented drink (beer, wine) that can be traced back as far as 6,000 B.C or as selecting seeds and plants for a better yield. Biotechnology also consists of production of recombinant molecules from a wide sources of organisms even from soil DNA (Santosa, 2001), cloning of animals and human cells, as well using of cell-based artificial organs for the fulfilment of human needs (Ishaug *et al.*, 1995)

The myriad definitions of biotechnology indicate the difficulty of explicitly delineating its boundary. The US Office of Technology Assessment defines biotechnology as "the collection of industrial processes that involve the use of biological system". In 1982 the Organization for Economic Cooperation and Development (OECD) defined it as "the application of scientific and engineering principles to the processing of materials by biological agents to provide goods and services".

The definitions includethe classical/traditional technologies of plant breeding, brewing, and production of fermented foods. Some scientists use a narrower definition and restricting the word biotechnology to the new biological and molecular techniques including gene manipulation, automatic DNA sequencing, polymerase chain reaction and other molecular techniques that emergence between 1970s and 1990s and found commercial applications (Old and Primrose, 1995).

The definition of biotechnology being used in this report follows BMFT (1992), namely "science and technique for producing goods and services by using living organisms or its derivates". Under this definition, biotechnology can be classified into 3 categories:

1. Classical biotechnology: includes traditional plant breeding, industrial production of bread, beer, wine, *arak*, cheese, *tempe*, *soya sauces*, *kimchi* and other fermented foods. Conventional waste management such as composting and biological waste treatment also belongs to classical biotechnology.
2. Modern biotechnology: further development of classical biotechnology due to development of advanced technique, fermentation technology and bioreactors. For example, industrial antibiotics production, enzymes, amino acids, tissue culture etc.
3. New biotechnology: application of recombinant DNA technology for producing transgenic plants, transgenic microorganisms, transgenic fish and transgenic animals; hybridomatechnique for production of monoclonal antibody, bioinformatics for understanding biological structure, genome projects, and genetically information; biosensor; animal cloning; gene therapy; molecular farming, and nanobiotechnology.

Biotechnology in Indonesia

Indonesia made an effort to support research and development in biotechnology, through funding and setting-up several institutions, i.e., Inter University Center for Biotechnology at Gadjah Mada University (UGM), Institute Technology of Bandung (ITB), Bogor Agricultural University (IPB), Research Center for Biotechnology at Indonesian Institute of Science (LIPI) and Puspiptek (Pusat Penelitian Ilmu Pengetahuan dan Teknologi) Serpong. Some institutions have even changed its name by adding the word "biotechnology", for example Research Institute for Biotechnology and Genetic Resources (formerly Research Institute for Food Crops), Indonesian Research Institute for Plantation Biotechnology (formerly Research Institute for Plantation). Many research and development in the field of biotechnology have been conducted in some institution in Indonesia that consists of several topics (Table 1).

Table 1. Summary of research and development of biotechnology in Indonesia (modified from Mulya *et al.*, 2003 and this study).[1]

Topic	Type of Research
Transgenic plants	Pest-resistant rice, disease-resistant rice (Blast)
	Pest-resistant soybean
	Virus-resistant groundnut
	Roundup Ready- (RR-) corn (herbicide-resistant, *Bt*-corn
	Disease-resistant cabbage
	Disease-resistant potato
	Delayed ripening papaya, virus-resistant papaya
	High-yield sugarcane
	Bt-cotton, RR-cotton, herbicide-tolerant *Bt*-cotton
	Disease-resistant coffee
Transgenic microbes	Over expression of protease gene in *E. coli* and thermophilic enzyme
	Recombinant phytase expressing fungi
Gene screening, gene detection and marker, molecular characterization	Polyhydroxy alcanoat (biodegradable plastic) gene
	Protease isolated from metagenomic libraries (soil DNA), protease gene
	Chitinase gene
	Virus coat protein gene
	Virus (CVPD)-resistant gene
	Map of QTL Local Chicken
	RAPD Polymorphisms of cow
	Molecular marker for fish and molecular diversity of fish
	16S gene libraries
	Metagenomic libraries
	Detection of genetically modified organism (GMO) in food and feed product
	ELISA-based detection of TBC
Enzymes and Antibiotic Research and Development	Protease enzymes
	Enzymes and antibiotic production
	Novel antibiotic against antibiotic multi-resistant human pathogens
Biofertilizer and environmental biotechnology	Rhizobium inoculants (Rhizo-Plus)
	Plant growth promoting rhizosphere bacteria (EMAS)
	Bacteria for bioremediation of petroleum waste and oil sludge
	Bioremediation of acid rock drainage, mercury contained waste, hexavalent-chrome, heavy metals (Pb, Cd) containing waste

[1]See Appendix 3 for a more detailed list.

IV. BIOTECHNOLOGY PRODUCT AND POLICY: INDONESIA CASE

National Policy on Biotechnology Development

In August 16, 2004 Indonesia ratified the Cartagena Protocol[3] through the approval of the People's Consultative Assembly. As a follow up of the ratification, the government, has to generate regulations or law to uphold the Protocol. This regulation has been prepared by the Ministry of Environment, through the NBF-GEF-UNEP project. The draft of the Regulation, called *Rencana Peraturan Pemerintah* (*RPP* or Draft of the Government Regulation) has been circulated among different public sectors[4].

Prior to the drafting of the Government Regulation, the regulation that Indonesia had used to regulate transgenic plants and food, was the Joint Decree signed by the Minister of Agriculture, Minister of Health, Minister of Forestry and Plantation, and the State Minister of Food and Horticulture. The development and implementation of the Joint Decree has caused controversies among different stakeholders, particularly between NGO and the government. One of the arguments put forward was that the development of the Joint Decree has defied many aspects of good governance. The regulation specifically states that genetically engineered products are safe unless proven otherwise (Article 1 no 19). This statement actually counters the precautionary principles that should be upheld, as written in the Protocol. As such, this regulation actually makes it relatively easy for private companies to import genetically engineered products without proper supervision.

There are several groups in Indonesia who believe that the Joint Decree is not a strong enough instrument to regulate Genetically Modified Organism (GMO). Ideally, the policy should be stronger, either in the form of *Undang-Undang (Law*, released by the Peoples Consultative Assembly) or Peraturan Pemerintah (PP, or Government Policy). However, prior to the official launching of the Government Regulation no 21/2005, there was no other policy to regulate transgenic plant and food development.

Ever since the downfall of the Soeharto regime, Indonesia is undergoing evolutionary process of democratisation. As a result, many sectors of the community are just beginning to realize their rights and power to influence policy. The rights of the public and their involvement in policy development is strongly practiced in the NGO community. However, this right has not been fully explored by the bureaucracy. This condition then became one of the cause that results in the differing perception on how to handle public participation in the country. Dialog between multi-stakeholder is also a new approach that just recently being introduced. In short, it can be said that Indonesia is in the process of democratisation and public participation is still at its early stage of development.

Public Perception and Participation

Arguments towards biotechnology at large has been going on for almost 18 years, whereas controversial issues in public pertaining to transgenic has only started in the past six years. The public, however, is still not yet well informed about many of the issues related to biotechnology. The public at large even seems to be quite unaware with respect to the presence of transgenic product in their daily lives.

A survey conducted by a government institution on the public (entrepreneur, trader, government officer, students, scientist, and homemakers) in Bogor (West Java), Bandung (West Java), and Malang (East Java) on transgenic soybean found that only 27.3% of the respondents recognized

[3] Cartagena Protocol is an international agreement, negotiated under the United Nations Convention on Biological Diversity, to regulate imports and exports of living modified organisms (LMOs). The Protocol's objective is to help ensure the safe transfer, handling and use of LMOs that could have potential harmful effects on conservation and biodiversity (including human health).

[4] The RPP has been officially signed by the President in 2005 and is now officially known as Government Regulation (Peraturan Pemerintah) no 21/2005.

cooking oil industry. Both soybean and corn are also utilized as cattle food (Mulya, 2003).

At the moment, based on tests conducted by the Biosafety and Food Safety Technical Team (BFSTT) in 2002, *Bt* corn and Roundup Ready (RR) corn from Monagro Kimia, Co. are ready to be released for planting and even declared safe for consumption (BFSTT, 2002). *Bt* cotton have been released for the past three years, but its availability now is nil, due to the lack of seeds that are not made available anymore. The complete list of available genetically modified (GM) crops in Indonesia is presented in Table 2.

Imported GM products in Indonesia have never been labelled for consumers. The importer claimed that there is no technical guide about labelling for imported GM product in Indonesia, although it is mentioned in Food Regulation issued by the government (Konphalindo, 2004) that GM products should be labelled.

Existing Policy on Biotechnology and Biosafety

Cartagena Protocol was approved to be the source in structuring the National Biosafety system. In Cartagena protocol, GM products are divided into GM product released to the environment (seed, animal, and microbial), and GM product used for food consumption, cattle food, and processing food. Approvals for each type of GM product utilization occurred through different procedures. All GM products that will be released to the environment (seed) should fulfil the criteria set up in Advance Informed Agreement (AIA) as stated in Cartagena Protocol.

In Indonesia, under the testing regulation, biosafety and food safety analysis will be conducted in 3 phases before the product shall be released for planting: 1) Proposal submission and revision, including data and information according to the Annex on Joint Decree signed by the Minister of Agriculture, Minister of Health, Minister of Forestry and Plantation, and the State Minister of Food and Horticulture; 2) Analysis on Biosafety Containment Test (BCT); and 3) Restricted Field Trials (Figure 2).

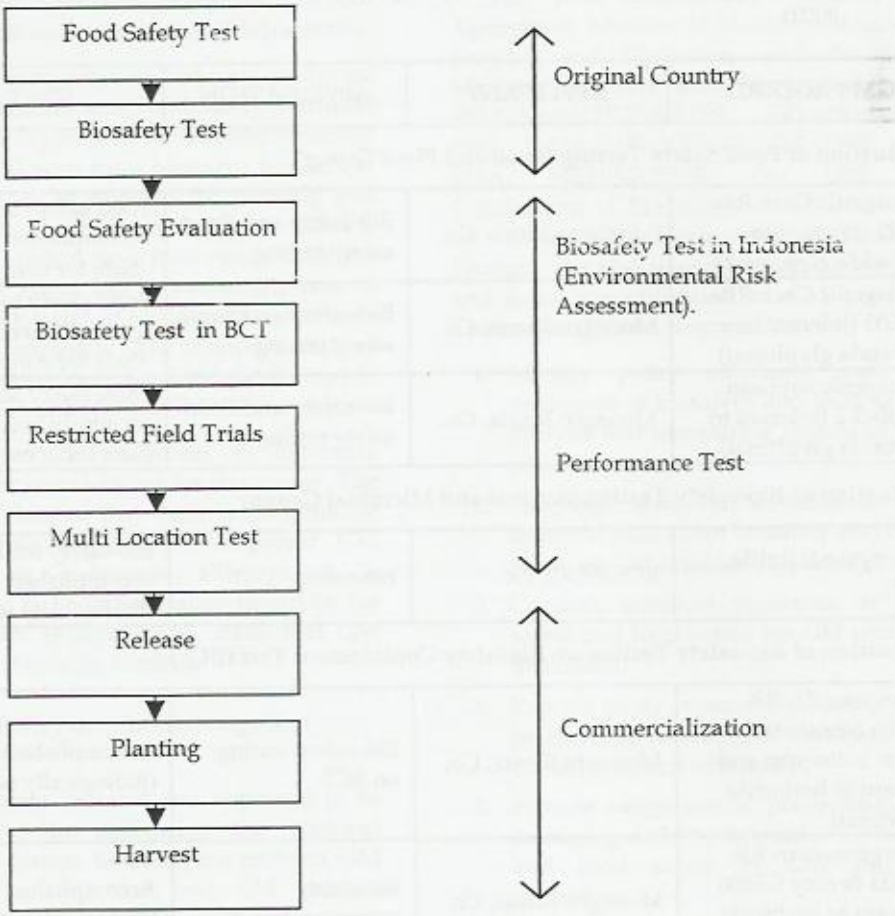
The Joint Decree by Minister of Agriculture, Minister of Health, Minister of Forestry and Plantation, and the State Minister of Food and Horticulture No. 998.1/Kpts/OT.210/9/99, 790.a/Kpts-IX/1999, 1145A/MENKES/SKB/IX/1999, and 015A/ MENEGPHOR/ 09/ 1999, on Commission of Bio-Safety and Food Safety on Genetically Engineered Agriculture Product, was also signed in order to support and assist the utilization of GM product. Their authority and responsibility:

1. Identify policy substance and the procedure of biosafety and food safety analysis and monitoring system of GM products;
2. Assisting both on submission and technical plan about biosafety and food safety on GM product utilization;
3. Conduct technical appliance of bio-safety and food safety for GM product utilization;
4. Provide safety recommendation of GM products as fundamental consideration on GM products utilization;
5. Provide suggestion in preventing and managing failures towards bio-safety and food safety in GM product utilization;
6. Conduct partnership and consultation among national and international institutions regarding to biosafety and food safety of GM product;
7. Provide relevant information regarding bio-safety and food safety on GM product;
8. Conduct evaluation on biosafety and food safety as the impact on GM product utilization.

Under the authority of the Commision of Biosafety and Food Safety on Genetically Engineered Agricultural Product (NBFSC), the Biosafety and Food Safety Technical Team (BFSTT) provides report of examination, testing, and assessment of bio-safety and food safety on GM product. During 2000 – 2003, the Technical Team conduct several test and examination on GM products from different company/ institutions (see Table 2). The only GM product that has been released into the field

Table 2. Status of genetically modified (GM) crops in Indonesia, 2000-2002 (source:BFSTT, 2002)

GM PRODUCT	APPLICANT	APPLICATION	STATUS
Evaluation of Food Safety Testing (Food and Plant Group)			
Transgenic Corn RR-GA21 (tolerant to herbicide glyphosat)	Monagro Kimia. Co.	Bio-safety and Food safety testing	Food safety testing is accomplished. (Safe for consumption)
Transgenic Corn RR-NK603 (tolerant to herbisida glyphosat)	Monagro Kimia, Co.	Bio-safety and Food safety testing	Food safety testing is accomplished. (Safe for consumption)
Transgenic soybean RR-40-3-2 (tolerant to herbisida glyphosat)	Monagro Kimia, Co.	Bio-safety and Food safety testing	Food safety testing is accomplished. (Safe for consumption)
Evaluation of Bio-safety Testing (Animal and Microbial Group)			
Ronozyme-P (cattle food).	ROSINDO, Co	Bio-safety	Bio-safety testing is accomplished (Biologically safe)
Evaluation of Bio-safety Testing on Biosafety Containment Test (BCT)			
Transgenic *Bt*/RR Cotton (resistant to cotton bollworm and tolerant to herbicide glyphosat)	Monagro Kimia, Co.	Bio-safety testing on BCT	Accomplished (Biologically safe)
Transgenic corn RR-NK603 variety C7630 (tolerant to herbicide glyphosat)	Monagro Kimia, Co.	Bio-safety assessment on BCT	Accomplished (Biologically safe)
Transgenic *Bt* corn (resistant to corn borer)	Dupont, Co.	Bio-safety testing on BCT	Ongoing
Evaluation of Bio-safety testing on Restricted Field Trial (RFT)			
Bt/RR Cotton (resistant to cotton bollworm and tolerant to herbicide glyphosat)	Monagro Kimia, Co.	Bio-safety testing on CFT	Accomplished
Transgenic Corn RR-NK603 variety C7630 (tolerant to herbicide glyphosat)	Monagro Kimia, Co.	Bio-safety assessment on CFT	Accomplished (Biologically safe)
Evaluation of Transgenic Plant Testing on RFT			
Transgenic *Bt* rice (resistant to rice stem borer)	Puslitbang Bioteknoloi LIPI	Transgenic rice testing on RFT	Will be conducted
Making guidelines and procedures			
Procedure for food safety test of GM product			Concept finalized
Guidelines			Concept uncompleted



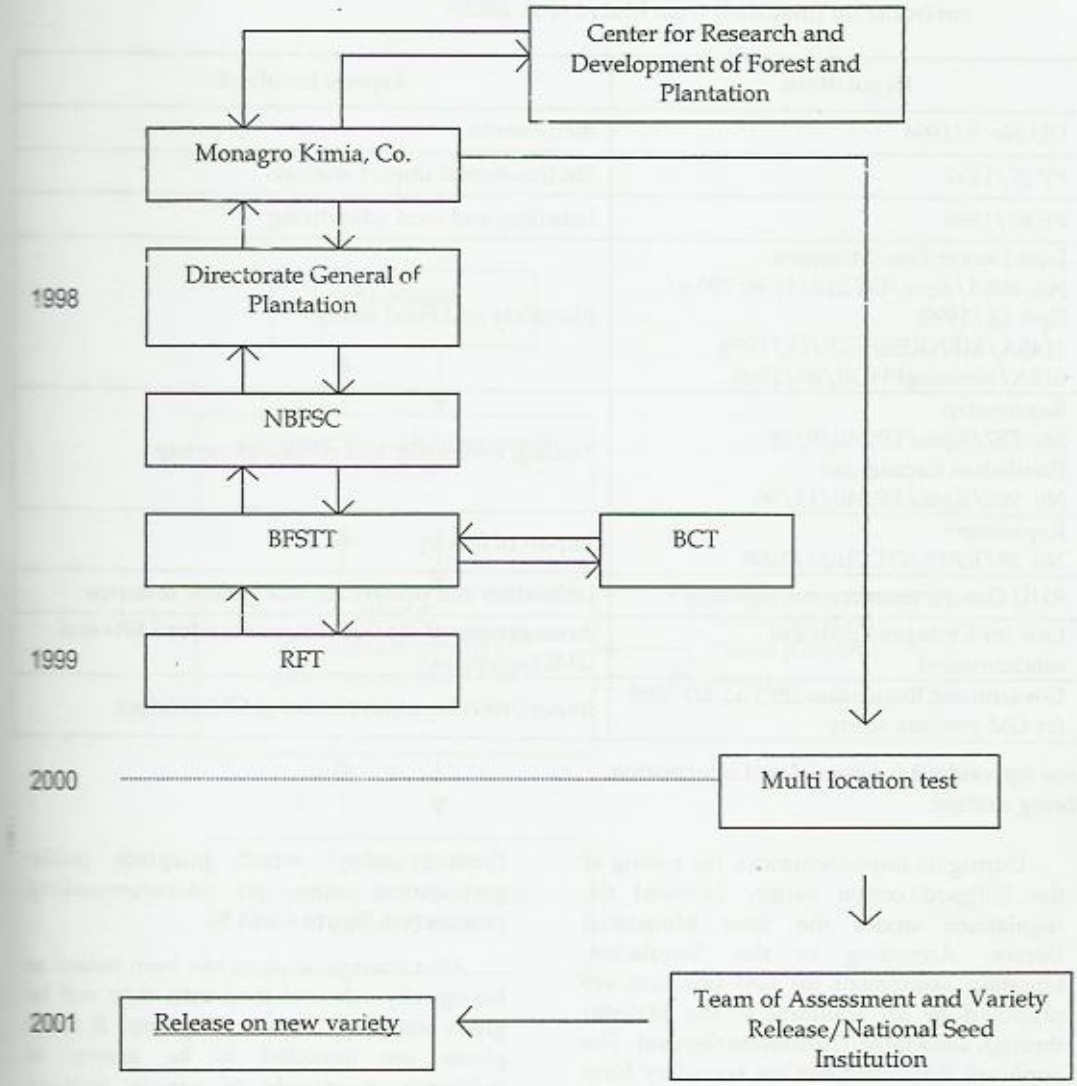
Notes
BCT: Biosafety Containment Test

Figure 2. Biotechnology implementation procedure in Indonesia

so far, at that time was Nu Cotton 35B (Bollgard). This product is resistant to insect pest belonging to Lepidoptera. Limited release of this product is justified in the Minister of Agriculture Decree No. 107/Kpts/KB.403/2/2001 and Minister of Agriculture Decree No. 03/Kpts/KB.430/1/2002. The release of this product sparked some controversy, as the multilocation test conducted was still in progress.

In 2001, 4,360.20 ha of transgenic cotton was planted in seven districts in South Sulawesi. This figure increased to 5,124.85 ha in 2002. Before being released, Bollgard cotton had undergo tests and biosafety assessment both at the BCT and RFT, as seen in Figure 3.

The use of GM cotton are regulated through three different phases: the introductory phase, assessment phase and release phase (Figure 3). Table 3 shows regulations which are associated with the use and release of GM product. Most of those regulations are controlled by central government. Local government will help in monitoring the implementation of the regulations.



Notes
NBFSC: National Biosafety and Food Safety Commision
BFSTT: Biosafety and Food Safety Technical Team
BCT: Biosafety Containment Test
RFT: Restricted Field Trials

Figure 3. The process of Bollgard cotton variety release (Bermawie et al. 2003).

Table 3. Regulations associated with release of genetically modified product into the environment (modified from Mulya et al. 2003)[1]

Regulations	Aspects Involved
UU No. 5/1994	Biodiversity
PP 27/1999	Environmental impact analysis
PP 69/1999	Labelling and food advertising
Joint Decree Four Ministers No. 998.1/Kpts/OT.210/9/99; 790.a/ Kpts-IX/1999; 1145A/MENKES/SKB/IX/1999; 015A/NmenegPHOR/09/1999	Bio-safety and Food safety
Kepmentan No. 737/Kpts/TP.240/9/98 Perubahan Kepmentan No. 902/Kpts/TP.240/12/96	Testing, reviewing, and release of variety
Kepmentan No. 26/KPTS/OT.210/1/1998	Import of fish fry
RUU Genetic resource management [2]	Utilization and preservation of genetic resource
Law for Cartagena protocol establishment	Arrangement of the traffic boundary for LMO and GMO countries
Government Regulation (PP) no 21/2005 for GM product safety	Import, development, release of GM product

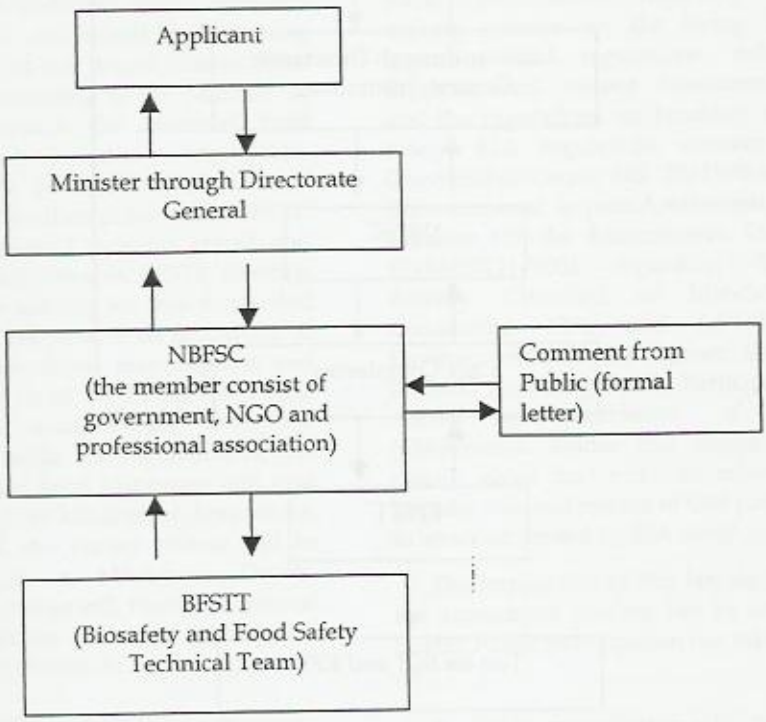
[1]see Appendix 3 for more detail information.
[2]being drafted

During its implementation, the testing of the Bollgard cotton variety followed the regulations under the Joint Ministerial Decree. According to this Regulation, biosafety assessment for GM products are proposed by an applicant to the Minister through associated Directorate General. The applicant then filled out the necessary form and requirements needed. The authorized person will then pass the documents to Commission of Biosafety and Food Safety on Genetically Engineered Agricultural Products (NBFSC) for their guidance and opinion or even recommendation on technical matter.

NBFSC then requests the supervision of the Biosafety and Food Safety Technical Team (BFSTT) to conduct evaluation and technical assessment on bio-safety and food safety, then report back to them. Based on the report, NBFSC will give recommendation to associated directorate general. This previous system is different from the system that was later on drafted under under the 'Government Decree on GM Product Safety' which integrate public participation into its decision-making process (see Figure 4 and 5).

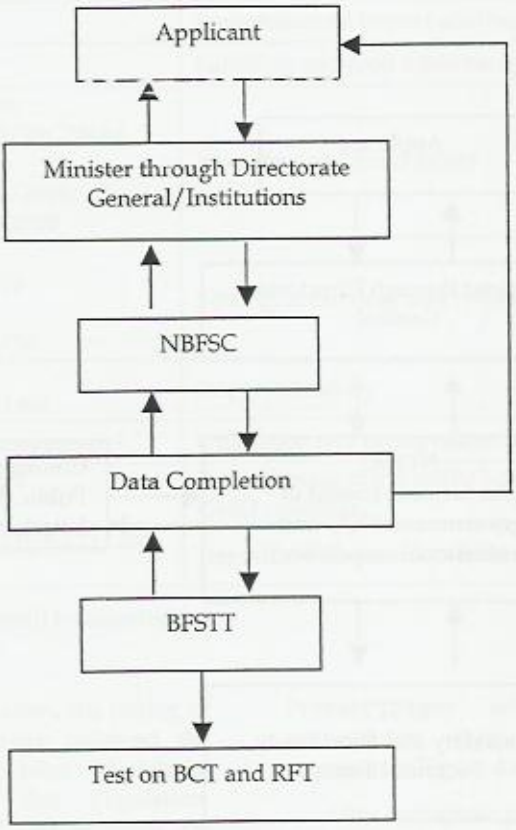
After transgenic plant has been issued as biologically-safe and food-safe, they will be given status as "common" plants. If these plants are intended to be grown in Indonesia, a cascade of variety testing/ release process should be employed (UU No. 12/1992 Article 12). Variety testing, examination, and release procedures are stated in the Minister of Agriculture Decree No. 902/Kpts/TP.240/12/96. Some of the articles in this Decree were revised under the Minister of Agriculture Decree No. 737/ Kpts/TP.240/9/98.

The process above is the standard process for both transgenic and non-transgenic seed. The test will then be conducted by government institutions or crop improvement institutions based on the requirements (Government Policy 44/1995 Article 18.4). Proposed variety testing should be declared to the Team of Assessment and



Notes
NBFSC: Commision of Biosafety and Food Safety on Genetically Engineered Agricultural Product
BFSTT: Biosafety and Food Safety Technical Team

Figure 4. Procedure of biosafety and food safety assessment based on the Government Decree on the safety of genetically modified product (Mulya *et al.* 2003)



Notes
NBFSC: National Biosafety and Food Safety Comission
BFSTT: Biosafety and Food Safety Technical Team
BCT: Biosafety Containment Test
RFT: Restricted Field Trials

Figure 5. Procedure of Bio-Safety Assessment based on Joint Decree of Four Ministers (Mulya et al. 2003)

Variety Release/National Seed Institution (Minister of Agriculture Decree No. 902/Kpts/TP.240/12/96 Article 5.1). Based on Minister of Agriculture Decree No 737/Kpts/TP 240/9/98 field tests for new variety should be conducted in several agro-ecologically different areas, with each area being planted for at least two seasons.

If necessary, the Team of Assessment and Variety Release/National Seed Institution could do a field assessment to the testing location. Based on the decree, results from the tests are submitted to the Minister of Agriculture through the National Seed Institution, to be reviewed in variety release. The applications, by Secretary of National Seed Institution are then presented to BFSTT. The applicant should presents report and completion of activities in BFSTT meeting. The result of the meeting are then forwarded to the Head of National Seed Institution. If the result is considered inappropriate and incomplete, the Head of the National Seed can decline the variety release, however if the applicant fulfils all requirements, the Head of National Seed Institution will give recommendation to Minister of Agriculture. If it is granted, the variety release will be authenticated in a Ministerial Decree. However, if it is rejected, Head of National Seed Institution on behalf of Minister of Agriculture will decline it.

Indonesia's Policy and Cartagena Protocol

Indonesia has several policies which include provisions for public participation in decision-making. For example, articles 51 and 52 of UU No. 7/1996 about Food mention public participation in decision making. According to both articles, the public has the opportunity to extensively participate in obtaining protection for every individual on issues in food consuming. In order to reach food security and intensify food system, the public are given a chance to deliver the problems they encountered, improvements ideas, or problem solving regards to food issues. Public contribution can be delivered both directly and indirectly through printed media, electronic media, seminar, also individually, or through organizations.

Public participation and decision making are also clearly mentioned in UU No.29/2000 regarding plant variety protection and environmental risk analysis, and in the Head of Environmental Impact Agency Decree No. 08/2000 regarding public participation and access to information on Environmental Impact Assessment (AMDAL) process.

There are two regulations that controls public consultation regarding decision making process on the living modified organism i.e. regulations related to Environmental Impact Assessment (EIA), and the regulations on biosafety and food safety. EIA regulations consists of: (a) Government Decree No. 27/1999 regarding Environmental Impact Assessment (b) State Minister for the Environment Decree No 17/MENLH/2001 regarding Type of Activity Classified as Mandatory for Conducting EIA, and (c) Head of Environmental Impact Agency Decree No. 08/2000 regarding Public Participation and Access to Information of AMDAL (EIA)Process. Under this regulation it is clearly stated that activities related to the introduction and release of GM products has to be accompanied by EIA study.

The implication of this last decree is that the assessment process has to involve the public. Public participation can take the form of:

- Public consultation with people that potentially will be effected by the release of the product.
- The rights to information access and the rights to voice the people's concern, opinion and response toward the proposed activity and its effect..
- Representatives of the people that are potentially affected shall have a position in the EIA Evaluation Committee. Result of the Committee's evaluation then becomes a source of information for the Minister of Environment or Governor/Head of District to take a decision regarding the proposed activity.

V. PUBLIC PARTICIPATION IN DEVELOPMENT OF BIOSAFETY POLICY

This chapter examines two types of public participation concerning the development of biotechnology policy in Indonesia. First, public participation involved in developing laws, policies and other legally binding rules concerning biotechnology. Second, public participation in decisions on specific activities of bio-safety and food safety matters such as permits and licenses.

Since these two types of participation are very much influenced by the existing laws and regulations, the chapter will start with how far the existing policies, laws and regulations provide adequate space for public participation on bio-safety and food safety issues. Then, we examine to what extent and in what way the public has participated in the development of biotechnology policies and regulations. Furthermore, on the last section of this chapter we depict how far and what kind of public participation has been involved in the assessment and issuance of permit or license of GM product with respect to *Bt* Cotton case in South Sulawesi.

Public Awareness and Participation under Existing Policies and Regulations

One of the important points in Cartagena Protocol with respect to awareness, education and participation of public is Article 23 that stated that the parties shall conduct:

- Promote and facilitate the awareness, education and participation concerning safe transfer, handling and use of living modified organism in relation to the conservation and sustainable use of biology diversity, and human health risk. In so doing Parties shall cooperate, as appropriate, with other states and international bodies;
- In accordance with their respective laws and regulations, consult the public in the decision-making process regarding living modified organisms and shall make the result of such decision available to the public, while especting confidential information in accordance with Article 21.

The essence of Article 23 can be used as a foundation to evaluate how far public participation has been accommodated in the existing policies and regulations. If we analyse further the policies and regulations that are directly linked to GM product, i.e. Joint Decree of four Ministers,1999 (see also Table 4), it can be seen that so far, there are not enough openness or not enough room that accommodates public participation as stated under Article 23 of the Protocol. This statement can be inferred from the following facts.

First, up to now, there are no policies and programs from the government toward promoting and facilitating awareness, education and participation concerning safe transfer, handling and use of living modified organism in relation to conservation and sustainable use of biology diversity, and human health risk. As a result, the majority of the Indonesian people do not understand nor are aware what exactly and how does GM functions in the field.

The result of study conducted by Mardiana (2002) showed that only 3% of the respondents (taken from food customers) who visited the groceries in Jakarta and Bogor areas are aware of the issue. Those consumers are characterized by more than Rp 250,000/week (or more than 25$ per week) allocated for food consumption; diploma or bachelor educational background (from college or university); access to information (subscribe newspaper/ magazine/internet); support food labelling of GM food; and fanatic to food safety (i.e. do not want to buy food product even though they are cheap).

Mardiana's research also showed that only 12% of the consumers are putting forth food safety as their primary decision when buying food product. Other respondents put down *halal* (40%), reasonable price (25%), and health (23%) as their primary concern

when buying food product. Also, in term of government role, there is an ambiguity with respect to regulations that controls public consultation regarding decision making process on the living modified organism i.e. regulations related to Environmental Impact Assessment (EIA), and the regulations on biosafety and food safety.

The opportunity for participatory public processes, at first, seems to be present under the Joint Ministerial Decree (1999) regarding Biosafety and Food Safety of Genetic Modified Product[6]. Under the Joint Ministerial Decree, public participation is represented either through NGOs (i.e. KEHATI and YLKI), professional organization (i.e. (PAU Bioteknologi IPB, PBPI and PIPI), or farmer' organization (HKTI), that all are members of Committee of Biodiversity and Food Safety.[7] One of the important task of this Committee is providing recommendation about the safety of GM product, as part of the analysis of the benefit of the product released. However, in reality, their presence in GEAP seems merely to fulfil the requirement of involving NGO's. The existence of HKTI, YLKI and KEHATI in GEAP as public representatives have not yet met the hopes of the public. No responsibility from government to share every evaluation phase to the public has meant that HKTI and KEHATI are the only ones who share the information to public at large. The public was only made aware of the GM product released only after the issuance of the Joint Ministerial Decree.

The structure of policies and regulation about GM in Indonesia so far, through the Joint Decree of Four Ministers, has not given enough space for dialogue at the national level. During its development, using *Bt* Cotton as a case study, implementation of the regulation has not yet accomplished the process explicitly as public perspectives, especially for scientists, NGO, and journalists.

This fact showed that the room for public participation is very much limited under this regulation. It is an irony the biotechnology companies that acquire permit for the biosafety test and food safety test (see Table 2) use the Joint Ministerial Decree as basis for GM product development.

Public Participation on the Development of Bio-Safety and Food Safety Policy and Regulations

Two important cases depict just how far the public has been actively involved in the design of policies and regulations on bio-safety and food safety. The first case is on the initiative to develop the draft of Law on Biosafety and Food Safety for Biotechnology product of GM, and the second case is on the initiative of drafting the Government Decree on bio-safety and food safety that was developed to replace the Joint Ministerial Decree. The discussion that follows explains in detail the form of public participation.

Draft of Law on Biosafety and Food Safety

The Draft of the Law on Biosafety and Food Safety for Biotechnology Product of GM is a draft that was fully initiated by the NGOs Coalition on biotechnology. The initiative started in 2001 and designed to regulate research, export, import, release, limited utilization, and distribution of GM product in the market. The prime motives of the NGO coalition to launch this draft were:

a. At present, there are no regulation in Indonesia that comprehensively regulate research, export, import, release, limited utilization and distribution of GM products in the market.
b. The existing regulation is only touching on issue of evaluation toward the risk for biosafety and food safety, but does not regulate evaluation toward the social, economy and ethical aspects from export, release, limited utilization of GM product.
c. Decisions made about limited utilization, release and distribution of GM product are only based upon biosafety and food safety factors,

[6] One of the weaknesses of the Joint Ministerial Decree is that the Minister of Environment was not involved in the development and issuance of the decree.
[7] Soon after the Joint Ministerial Decree was issued, YLKI resign from NBFSC because they have never been officially asked to join the Commission.

without taking into consideration the social, economic and ethical impact of GM product for the society at large.

d. The existing regulation (Joint Ministerial Decree) does not provide room for public participation because:
   - Does not acknowledge the right of the people toward access to information on research activities, export, import, limited utilization, release and distribution of GM product in the market.
   - Does not provide control that the government has the responsibility to give information on all GM product that has been given permits or being declined, with respect to the import, limited utilization, release and distribution of the GM products, including reports on risk analysis.
   - Does not acknowledge the fact that the government has the responsibility to consult the public and provide room for the public in the decision-making process toward plans of the imports, limited utilization, release and distribution of GM products.
   - Does not consider the right of the people to report the impact of GM product to human health as well as to ecological stability.

e. The existing regulation (Joint Ministerial Decree) does not administer compensation and responsibilities of bodies that should be strictly liable toward any damages on the environment and biodiversity, including economic damages as a result of the import, limited utilization, and distribution of GM product.

f. It is not clear how the present draft of Government Decree on biosafety and foodsafety (RPP) will process compensation and/or liability and how it will take place, if later on in the future, environmental and socio economic damages occur.

The draft of the Law that was initiated by NGO Coalition is attempting to overcome those weaknesses. The last time this draft was discussed was in the year 2001, where several government agencies participated in the process. After 2001, the draft was not discussed further due to limited funds. In addition, many government agencies are also sceptical about the continuation of the process toward development of the Law because the process for formulation of Law and the issuance of the Law is a very long and time-consuming process. This is why the government (in this case the Ministry of Environment) prefers to develop and issue a new Government Decree (to replace the Joint Ministerial Decree). The process to develop a Government Decree is relatively shorter and the resulting regulation can then be used to tackle biosafety and food safety issue. However, it should be noted that public participation then can result from this process can be very minimal, especially since Government Decree does not involve the participation of the House of Representative (Dewan Perwakilan Rakyat, or DPR). At present it can be said that the involvement of the House of Representative in biosafety regulation are still minimal.

The NGO that are united in developing this Law are Konphalindo, ICEL and YLKI. In addition, several university experts are also involved in this coalition. They provide the coalition with technical expertise. This coalition is also active in the drafting of the Government Decree that was initiated by the government.

Draft of Government Regulation

The Draft of Government Regulation – that was initiated by the Ministry of Environment - administers research and development, importation, studies, release and distribution, utilization and control of GM product. Within the Draft of Government Decree, the following regulates public participation:

a. The public are given a-sixty day-period to respond in writing to the National Commission on Biodiversity and Biosafety before the Commission issued a recommendation on food

safety or biosafety toward a certain GM product.

b. The public and consumers can report to the government if after the release, distribution or utilization of a certain GM product there is a negative impact of the GM product toward health and the environment.
c. Representatives of profesional organizational, associations, and the public sit on the National Commission on Biosafety and Food Safety of GM product.
d. The mechanism of public consultation during the studies, release and distribution of GM product is not regulated enough in the Draft of the Government Decree. The absence of mechanism for public consultation is underscored by the fact that there is a clause that stated that EIA is not needed for products that have been declared biologically safe or food-safe or feed-safe.

From the two regulations discussed above, it can be seen that public participation is enhanced under the Draft of the Government Regulation compared to the Joint Ministerial Decree, although, when compared to the draft Law that is initiated by the NGO coalition, the public participation process is very much limited (Table 4). It can be said that the steps taken by the Coalition of NGO to draft a Law is a strategic step because if it does result in the establishment and issuance of a Law, public participation will have wider room through various mechanisms.

Given their role in drafting suggested regulations, it is clear that NGOs have an important part as a pressure group on biotechnology issues compared to other actors involved (consumer and farmer) who use GM products. The following chapter will explain the NGOs' efforts on GM product decision making, in the case of the Bt cotton release in South Sulawesi.

Public Participation on Assessment and Release of GM Products: *Bt* Cotton Case

This chapter will not examine the chronology *Bt* cotton case in South Sulawesi, nor to judge who is right and who is wrong in the controversy on *Bt* cotton release. Instead, this chapter discusses the depth of public involvement in the *Bt* cotton release in South Sulawesi Province which then accelerated the conflict between supported and opposed the transgenic cotton release. The supportive actors are transgenic cotton producer (Monagro Kimia, Co.), several of farmers who use transgenic cotton, central government (Department of Agriculture), local government of South Sulawesi, and several scientists who support transgenic cotton. The actors who are against the release of transgenic cotton and took a more cautious roles consist of Coalition of NGOs, farmer groups who are opposed to *Bt* Cotton, and several scientists who believed the practice of precautionary approach.

a. Role of NGOs

Konphalindo, PAN Indonesia, and YLKI are few examples of Indonesian environmental NGOs that are concerned with the issues of biotechnology. Among those three NGOs, Konphalindo can be said to have the longest time dealing with this issues. One of the important agenda that delivered by the NGOs is to increase community knowledge and awareness on the issues of bio-safety and food safety (see Box 1). When the *Bt* cotton issue arise, the NGOs disseminate and circulate intensely the bio-safety and food safety knowledge and discourse to publics, farmers as well as to other NGOs. As result, demand for bio-safety and food safety rise and filled the column of newspapers during 2000-2001 (see Appendix 5). Aside from that, various meetings, roundtable discussions and seminars are conducted across the country by the NGOs (see Appendix 7). During this period, scholars also produced numerous articles in newspapers and papers concerning bio-safety and food safety (see Appendix 6). The degree of involvement of farmers and scholars in *Bt* cotton controversy, will be depicted in section "*b. Role of Farmers and Scholars*".

The content analysis to all of those collected materials collected from January 2000 to December 2004,[8] and in-depth interviewed conducted during field study, shows that weak governance is the prime concerns over *Bt* cotton as well as the GM products, whereas the bio-safety and risk of GM products including *Bt* cotton follows on the second rank. Table 5 shows the result of content analysis derived from newspaper in 2000-2004. The governance factors that triggered the *Bt* controversy among others are lack of transparency on the government decisions, wide array of collusions, generate dependency of farmers on GM products, and lack of public participation.

Eventhough the polarization to advocates (pros) and the more cautious groups to *Bt* cotton are triggered by the governance problems, however, the two opposing underlying 'ideology' toward GM products, namely,the developmentalism and the eco-justice, are also considered to contribute to the controversy. The advocates/pros believe that GM products are great solution for overcoming food scarcity and health problem. The advocates have faith that the GM product will not exert a risk to bio- safety and food safety. Further, they also firmly believe that the GM product will boost agriculture production and enhance economic development. Government, inventor companies, GM producers, and developmentalist scholars are amongst this group. On the other side, the more cautious group believes that the GM products are a new form of economic imperialism from developed to developing countries through Trans National Corporation (TNC). The TNC dominate the global food security systems through two strong powers that work simultaneously e.g. the biotechnology knowledge and world agricultural trade system. Aside from that, the cautious groups are also deeply concerned with the unclear risk of the product.

During the *Bt* cotton controversy, the NGOs increased their activities from campaign to advocacy. The advocacy consists of three consecutive activities: first, increase the public pressure; second, extend the networks and coalitions; and third, claim a lawsuit. Then, follow the fourth, the epilogue of the *Bt* cotton controversy. Below is the stage of those four activities.

- *First Phase: Increase Public Pressure (May – August 2000)*

The advocacy activities began when Konphalindo demand the information to the government regarding distribution of transgenic products in Indonesia (May 2000). However, as there was no positive respond from the government, the NGOs started to force by launching a press release mentioning that Indonesia has become the testing ground for transgenic products (28th August, 2000). Soon the pressure was increased and resulted on the cancellation of MOU between Monagro Kimia, Co. and Minister of Economy, Finance, and Industry that provide the way for Monagro Kimia to plant the *Bt* cotton in 10,000 ha of land in South Sulawesi Province (September 2000).

The public pressures initiated by NGOs are the reactions to three earlier events. First, the *Bt* cotton field test on 500 ha of land in South Sulawesi, followed by selling cottonseed and buying cotton production from the farmers (May, 1999). Second, there were no clear rules under the Joint Ministerial Decree, regarding the selling of cotton seed and buying the cotton production that under field test status. Third, on August 2000, the government stated that there were no transgenic plants released on the field. NGOs perceived this statement as contradictory to the real field condition.

- *Second Phase: Increase Control and Networks (September 2000 – February 2001)*

During the end of September 2000 until February 2001, NGOs extend its pressure and build networking among NGOs as well as to government actors. The activities were as follows: First, the NGOs actively involve in the assessment on multi location test for

[8] The *Bt* cotton issue fill the newspaper columns during 2000-2001. However, some of the data collected are produced during September 1999 to December 1999.

Table 4. Type of public participation according to existing regulations and drafts of new regulations

Type of Public Participation	Existing Regulation	Development of New Regulations	
	Joint Ministerial Decree	Draft of Government Regulation (RPP) [2]	Draft Law (RUU)
1. Access to information, concerning:			
a. Proposed activities for import, release, limited use & distribution of GM product	No	No	Yes
b. Decision on GM product (approved or refused for import, release, limited use & distribution of GM product)	No	No	Yes
c. Risk assessment report	No	No	Yes
2. Delivering the response in written, 60 days before decision on bio safety and food safety is decided by GOI	No	Yes	Yes
3. Member of Commission on Biodiversity and Food Safety	Yes	Yes	Yes
4. Public consultation concerning proposed activities for import, release, limited use & distribution of GM product	No	No	Yes
5. Decision on GM product should take into account public concern	No	Yes[1]	Yes

[1] if there is written respond aimed to GOI

[2] Now has been officially named Government Regulation no 21/2005

Box 1. People Education by Local NGO In Bulukumba.

Since its establishment in October 1999, Yayasan Pendidikan Rakyat (People Education Foundation - YPR) has conducted several activities related with people education and organization to liberate the farmer, fisherman, and poor urban community. Their activities were concentrated in three districts in South Sulawesi province, i.e. Bulukumba, Bantaeng, and Jeneponto. During those periods, almost all communities in all villages in Bulukumba (about 124 villages), 3 villages in Bantaeng, and one village in Jeneponti were aided by YPR in capacity building, i.e. to increase their critical thinking. YPR, as an institution has a primary objective to conduct critical education process to people in the southern part of South Sulawesi, including Selayar, as mentioned by Adi (former coordinator of YPR).

Through their activities of critical education for the public, primarily those related with environment, YPR stumbled into the facts of transgenic cotton plants in the field. Those informations were gathered during their meeting with farmers in Bulukumba. The first information about the planting of Bt cotton as part of the implementation of Minister of Agriculture Decree No. 107/2001 was received from Dinas Perkebunan Bulukumba District. Based on that information, YPR then followed it up with more study and investigation on transgenic cotton. YPR stated that the process of transgenic cotton introduction was not transparent; that information about the potential risk and impact should have been brought about early on in its introduction.

Prior to the introduction of Bt cotton, Farmer Field School for Integrated Pest Management - SLPHT) was set up to help educate farmers about crop managment. The use of SLPHT approach, according to Adi, a member of YPR, is actually an excellent idea as part of farmers' education process because through this school, farmers are taught to learn, recognise, understand, and make their own decision regarding crop management. The introduction of Bt cotton, however, was using a 'top-down' program which was seen as destructive towards farmers' education, since it provide little room for farmers' to practice their critical thinking and analysis, a system that has been developed in SLPHT by Dinas Perkebunan and people education by YPR.

During the period of Bt cotton introduction, Branita Sandhini Co, a private company involved in the implementation of Bt cotton in South Sulawesi- established Asosiasi Petani Kapas Indonesia (Indonesian Cotton Farmer Association - Apekindo). Instead of selling Bt cotton seed Branita Sandhini also promised to buy all Bt cotton produced by the farmers. The local farmers were split in two with respect to which seeds to plant. On one side, several groups wanted to try the new Bt cotton variety, while other groups prefer planting the local Kanesia variety, which they previously have planted before. However, due to the fact that the local seed cotton –the 'Kanesia' variety- are not available and the Branita Sandini promises to buy all Bt cotton produced, several farmers' groups then decided to grow Bt cotton. It was indeed not known by the farmers why the "Kanesia' variety are not available at that time. In fact, all of the seeds that were available was the Bt cotton that were distributed by Branita Sandhini.

The farmers who refused planting Bt cotton are farmers who have previously been involved in the SLPHT Farmer Field School. Their main arguments were:

1. They view the project as not transparent

   Since the Joint Ministerial decree was established in 2001, there was only one time that the company conduct meeting with the farmers. This meeting was filled with promises of the success and superiority of Bt cotton. There was a lack of transparency with respect to the whole preparation process and multi-location test. This unbalance condition also was worsened by information from Dinas Perkebunan to farmers that *Bt* cotton is a national program, thus local government has no authority on any decision pertaining to this project.

2. Increase dependency toward seed company

   The farmers realised that the Bt cotton has a very strong business purpose, because the seeds can only be grown once (i.e the farmers cannot use the seed produced for next year's planting) thus the farmers became dependent on the seed company. This is in counter to what the SLPHT farmers have been taught where they were encouraged to reduce the input in farming process and in fact, that farmers' can produce their own cotton seed. This realization all came from the learning process that low external input is a better way of farming system, not only in cotton but also in other commodities.

This situation shows how the controversy over Bt cotton has moved from the national level (between national NGO's and the seed company) down to the local level, where both sides have their respective farmers' group. In the end, it was shown that Bt cotton project was a failed project in South Sulawesi. However, it is interesting to note that our findings suggested that the arguments put forth by both side of farmers' against using Bt cotton are related to unreliable production and input cost. No one was touching the issue about safety and risk. Instead the issue that was raised was more on the high price of the seed, the unavailability of Bt cotton seed when it was time to plant, and the price of the product that were also not according to previous deal with Branita Sandhini. Overall, our findings found that the farmers' generally refused to grow Bt cotton based on those reasons. The burning of transgenic cotton by farmers was a reaction of disappointment over low cotton production, unbalanced high costs in production input (especially cotton seed), and low selling price during harvesting.[9] Before the planting season, both farmers and the company had agreed to have fixed seed price and selling price. However, later the company changed their price.

In the end of interview, Adi also added that development of other type of cotton or plant in Bulukumba will be facing great obstacles in the future because farmers has already felt cheated, and according to traditional norms (*siri*) within the community, *once, there is distrust, it will be impossible to earn the trust again.*

[9] On the early period, seed price was Rp. 40.000/kg, in second year it increased to Rp. 80.000/kg , and in planting season 2002 seed price became Rp. 100.000,-/kg.

Table 5. Number of GM products's articles and news in newspaper (including *Bt* Cotton issues), January 2000 – December 2004[1]

Issues related to GM Product (including *Bt* Cotton)	Number of Article/News in Newspapers					Total	Percent
	The period of *Bt* cotton issue			Post *Bt* cotton issue			
	2000	2001	2002	2003	2004		
1. Regulation weaknesses, policy transparency, corruption & collusion, & public participation	18	37	11	2	5	73	30
2. Bio-safety issue and risk of Bt cotton	15	16	18	7	6	62	24
3. Economic issues of Bt Cotton i.e. economic returns, economic dependency and potential losses	6	9	2	1	1	19	7
4. Moral and ethical issues	-	3	1	-	-	4	2
5. Number 1 and 2 above (regulations & biosafety issues)	21	3	6	2	2	34	13
6. Number 1 and 3 above (regulations & economic issues)	2	1	4	-	2	9	3
7. Number 2 and 3 above (biosafety & economic issues)	5	-	5	1	1	12	5
8. Number 1, 2, 3 and 4 above	5	1	3	1	1	9	4
9. Could not classify	2	9	7	1	4	23	11
Total	74	82	57	23	22	248	100

[1] See Appendix 5 for further detailed information

Bt cotton (working with Center for Research and Development on Industrial Plantation, Department of Agriculture, and Ministry of the Environment). On November 2000, the parties concluded that the multi location research has to be repeated with more valid research plan. Second, on November 2000 and January 2001. NGOs demand the report of biosafety result to the government. However, both have never been answered. Third, on December 2000, after hearing with NGOs, the local parliament of South Sulawesi agree that an intensive research and observation to *Bt* cotton application should be conducted and supported with an Environmental Impact Assessment (*AMDAL, Analisis Mengenai Dampak Lingkungan*). Fourth, on February 2001, four NGOs (ICEL, Konphalindo, YLKI and PAN Indonesia) established NGOs Coalition for Biosafety and Food Safety. Later on, the member of Coalition became 71 NGOs.

The above NGOs actions are the response to two activities conducted by the advocates i.e. the campaign of transgenic cotton and the issuance of the Decree of Minister of Agriculture. On September 2000, national and international experts and the Cotton Farmers Association are involved and supported the *Bt* cotton campaign, which was held by the private company. Within the next six months, on February 7, 2001, the Minister of Agriculture promulgated the Decree No. No: 107/ Kpts/ KB.403/2/2001 concerning limited release on transgenic cotton Bt DP 5690 B as leading variety labelled NuCOTN 35B (Bollgard).

- *Third Phase: Legal Actions Process (March – September 2001)*

During this periode the NGOs Coalition enter the legal phase by issuing formal summation to the Ministerial Decree No.107/Kpts/KB.430/2/2001 on March 2001. The summation, then, followed by lawsuit to revoked the Ministerial Decree. On 4 May 2001, the NGOs Coalition filed lawsuits against the government in the court of Pulo Gebang, Jakarta, as follows:

a. Ministerial Decree No. 107/Kpts/ KB.430/2/2001 concerning limited release of transgenic cotton Bt DP 5690B as leading variety labelled NuCOTN 35B (Bollgard), are againsts the Government Decree PP No 27/1977 regarding Environmental Impact Assessment (*AMDAL*).
b. The decree issued by Minister of Agriculture is classified as an illegal regulation.
c. The defendant (Minister of Agriculture) has used his juridical power for other purposes (misused of power).

The lawsuit strongly shows that NGOs' objection to the release of *Bt* cotton is due to the absence of good environmental governance (see also the result of content analysis in Table 5). Table 5 also addresses four sensitive issues (transparency of policy, public participation, potential economic dependence, and the issue of moral and ethic) that closely connected with GM product in Indonesia. These four issues eventually became the essential points in the Draft of the Law (RUU) formulated by the Coalition of NGOs.

While the legal process was underway in the court, some important issues took place.

- First, on March 15th 2001, NGOs reported that 40 of tons transgenic cotton belonged to PT Monagro Kimia has landed in Hasanuddin Airport, Makassar.
- Second, PT Monagro Kimia through its lawyer wanted to be one of the defendants, as their role as supplier of transgenic seed would be disturbed if the Ministerial Decree is revoked. Similar actions were also taken by 29 Sulawesi's cotton farmers, who, through their Lawyers in Jakarta, wanted to become defendants. The NGOs Coalition thus, faced defendants consisting of government (in this case Department of Agriculture), PT Monagro Kimia, and 29 cotton farmers of Sulawesi.
- Third, in early of September 2001, the Minister of Agriculture – after attending cotton harvest in Bantaeng, South Sulawesi – stated that the government plan to develop transgenic cotton in larger areas. The NGOs

Box 2. NGO press release regarding Bt cotton in Indonesia.

The open court case for canceling Agriculture Ministry letter of policy No. 107/kpts/KB.430/2/2001 about the limited release of transgenic Bt. cotton in Indonesia.

Jakarta, 23 of August 2001

When pure science is a gamble: to whom will scientists give the responsibility? Government authority, companies or the community?

Court of justice room at "Pulo Gebang" (in Jakarta) on Thursday August 23th, 2001 was full of experts from many different fields; they gave input from each of their fields, which hopefully could support the court of law in seeking the truth about the issues in this case. The proponent of the case (NGO Coalition for Biosafety and Food Safety) presented Agus Permana, an entomologist from Institute of Technology in Bandung, and Suryo Adiwibowo, the Director of the Centre of Environmental Research. While the defense presented Ambo Alla (University Hassanudin, Makassar, South Sulawesi), Ibrahim Manwan (University Hassanudin) and Antonius Suwanto (Bogor Agricultural University).

According to Agus, transgenic cotton is non-native species introduced to Indonesia, and the way it was developed it was aimed to handle the cotton pest problems, like with other technologies all have benefits and risks, which need to be considered carefully before further development. But transgenic cotton was not the answer to pest problems, because there is evidence in the US and Australia, countries which use transgenic cotton, they have pest resistance; therefore pesticides are still used to handle the problem. Agus claimed that launching transgenic cotton without doing research in all scientific aspects of this crop was a brave act. He confirmed that until now there is no genetic modified technology, which has put genes in to organisms permanently as what the creator wanted, but the process of "shooting genes" can be expressed in any part of a plant. Due to this uncertainty, transgenic Bt. cotton will then produce the poison (bio-pesticide from Bt.) in all parts of the plant, due to this reason there needs to be more in depth studies and concrete research into the planting Bt. cotton in Indonesia.

Agus also reminded the court about the potential for poison (bio-pesticide) accumulation of Bt. cotton in fields where it is grown, and how the future effect could be similar to what already happened with DDT. DDT was sprayed over large areas and found its way in to the food chain even in to mothers milk that caused many problems. It is not wise if: Indonesia's environment is destroyed by a technology and capital for these products is from outside of the country and the financial benefit goes to the technology developers outside of the country, while actually Indonesia has developed a pest control method using natural predators, which is called Integrated Pest Management.

Suryo Adiwibowo explained that an Environmental Impact Assessment (AMDAL in Indonesian) should be held when introducing foreign plant varieties in Indonesia. Because cotton is one of these foreign varieties, it should pass this process, because AMDAL takes into account the value of ecology, economics, and social issues in a preventative sense; i.e., it follows a proactive, not reactive method. AMDAL processes became ineffective once the transgenic cotton was planted in the communities' fields and products were sold, as admitted by Monagro (Monsanto's Company in Indonesia) public relations department at the end of 2000, because AMDAL lost its opportunity. Suryo's document explained that AMDAL should run by the product developer, in this case the company who initiated transgenic cotton has to take responsibility of it. To defend Monagro company, Hotman Paris (a person's name) said that Agriculture Ministry's letter of policy 107/2001 was not a permission for business letter for the

Monagro company, and that the company who sold seeds in South Sulawesi was not Monagro but another company named Branita Sandhini. According to him, therefore, and supported by Kartika Adiwilaga from the Monagro company, the accusation was directed at the wrong party. The reality that was forgotten by Hotman was that the Coalition's accusation was against the Ministry of Agriculture for the way it used its authority because it didn 't do anything to the Monagro company for its infraction in commercialization before launching a foreign variety and for not doing an Environmental Impact Assessment. The Monagro company felt threatened by the Coalition's accusation towards the Agriculture Ministry, so it then joined the court case as a co-defendant.

The other expert witness from defense was Ibrahim Manwan, who was not involved in the court case from the beginning even though he is the chief of monitoring and controlling team for transgenic cotton, formed by Governor of South Sulawesi. He explained about the benefits from transgenic cotton and said that there is no negative impact toward non-target insect species and that it gives positive impacts for the farmers. How can he be so sure of that, when in the field they are just beginning the harvesting of the crop, (therefore there is no harvest data this year) while the price of seeds has risen by two times from Rp. 40 000 to Rp. 80 000 (per Kg).

Previously in another meeting Ibrahim explained that only 50% of the transgenic cotton actually grew to its full potential, 10% totally failed and 40% just have 10-15 cotton bolls, meaning that harvests were less than 1 ton (per Ha). He forgot about Monagro and its branch company's "big" promise that farmers will harvest for 3-4 tons (per Ha), but he was still convinced that Bt. cotton in South Sulawesi was a success. Ambo Alla and Antonius also said the same things, just about the benefits and that the crops have no negative effects. They forgot how busy the cotton farmers were when there was pest attack such as in Bulukumba. They forget that there had been total crop failures in some places.

The questions that follow this are: are the defendants being honest in this court case, don't negative and positive implications exist with all technologies? How are they so convinced about transgenic cotton? Have they done the research? Who will fund the necessary research? Unfortunately these questions have not yet been answered in the court, while in the cotton fields in South Sulawesi, farmers are confused by pest attacks that have erased their dream to become rich. Who dares to say that this cotton is friendly with environment while in fact farmers should spray it with pesticides? Who dares to take responsible towards the farmers with the raising costs of seeds? The reality is the farmers will be in debt and that has to be paid by them. Where is the justice?

NGO Coalition for Biosafety and Food Safety
Koalisi Ornop Untuk Keamanan Hayati dan Pangan
24th of August 2001

Table 6. Activities of actors involved in the transgenic cotton controversy

Actors		Activities at Local level	Activities at National level
Bulukumba Farmers	Challenger	• Protest and demonstration reject *Bt* cotton project • Collaboration with local NGOs	Rare
	Advocates	• Involve in public debate • Protest and demonstration to accept *Bt* cotton • Supported by local government and private sector	Frequently involve in public debate (mostly facilitated by private company)
Scholars	Challenger	• Seminar, discussion, public debate • Publish articles and paper • Involve in monitoring and evaluation team of *Bt* Cotton impacts	• Seminar discussion, public debate • Publish articles and paper • Expert witness in court
	Advocates	• Seminar, discussion, public debate • Publish articles and paper • Send letter to local politician	• Seminar, discussion, public debate • Publish articles and paper • Expert witness in court
Local NGOs	Challenger	• Organizing public debate/ discussion • Organize farmer reject *Bt* cotton • Protest and demonstration • Develop local network	• Source of information for NGO Coalition
National NGOs	Advocates	• Organizing public debate/ discussion • Increase farmer awareness on GMO issues • Investigate and collect data on process and impact of *Bt* cotton	• Publish newsletter, brochure and other publication for increasing public awareness • Press conference and article in newspaper • Organizing public debate/ discussion • Letter of protest to government policy • Develop NGO Coalition for Bio-Safety and Food Safety • Legal suit to government and private company

Note: the term Advocates are used to depict the supporter of transgenic products, whereas the challengers are used to depict the more cautious group.

Coalition deem the Minister's statement as premature, as the Environmental Risk Analysis and socio-cultural impact was not yet finished, and disrespectful to the legal process that was underway.

On September 27th 2001, the Court decided to overturn the case that is proposed by the plaintiff and punish the plaintiff to pay the cost of the case. On December 7th 2001, NGOs Coalition appealed to Higher Court, but nevertheless on February 2002 the Coalition again are defeated in Higher Court. NGOs Coalition then appeals to Supreme Court (see Box 2), but until the end of the *Bt* cotton project, this legal effort have not be settled.

The legal actions mentioned above mainly conducted by the NGOs in Jakarta. The local NGOs work for increasing the awareness of farmers and mobilizing efforts to oppose the transgenic cotton (protest or demonstration). Aside from that, the local NGOs became the prime source for Jakarta based-NGOs regarding the latest information of field conditions. On the contrary, the Jakarta based-NGOs were also important sources of information for local NGOs for directing their field activities in accordance to the latest situation in Jakarta. Table 6 exhibits summarised the invovement of NGOs, farmers and scholars mentioned above.

- *Fourth Phase: The Epilogue*

In 2003, as it was no longer economically viable to sell *Bt* cottonseed in Sulawesi, Monsanto decided ceased to supply *Bt* cottonseed in Indonesia and withdrawal from Sulawesi. The Monsanto's withdrawn has settled the dispute between the Pros and the Contras to *Bt* cotton, eventhough the stakeholders of GM products remain deeply divided. Possibly, the withdrawn also motivated by investigation of the U.S. Security and Exchange Commission (SEC) to Monsanto involvement in corruption practices. At 2002, a Monsanto employee "authorized and directed" an employee of an Indonesian consulting firm to make an illegal payment of US$50,000 to a senior Indonesian Ministry of Environment official to "incentivize" him to amend or repeal a requirement for GM crops – including Bt cotton – to undergo an environmental impact study before authorizing cultivation.

While the requirement was not in fact amended, the bribe was accepted, and in early 2005 Monsanto admitted to paying bribes to several officials in the Indonesian government between 1997 and 2002. US SEC found at least 140 times of amount of 700,000$, during 1997 – 2002, flow to senior officer and staffs of Department of Agriculture and its families from Monsanto for paving the way the Bt Cotton release. Further, the US Department of Justice sentence Monsanto for 1 million$ as Monsanto demands to suspend the prosecution (St. Louis Business Journal 03/22/04, and Reuter 03/23/04). At present, the Indonesia's Anti Corruption Committee conducts intensive investigation regarding this matter.

b. <u>Role of the Farmers and Scientists</u>

In dealing with the issue of biotechnology or the GM products, Indonesian scientists may be divided into two groups. The first group is scientists that support the GM products. They perceive that the GM products do not have potentially high risk to bio-safety and food safety. The second group is scientists that will support the GM products as long as there is no risk to environment & health, and not creating economic dependency to the TNC.

Both types of scientists, in fact, are not many in Indonesia as the GMO issues including the socio-economic and ethical aspects of biotechnology is quite new in Indonesia.[10] Most of the first group of scientists (or the supportive scientists) work for government's research institutions and the state universities. Whereas, the second group of scientists (or the cautious scientists) works in the state universities. As a result, in the same university people may find scientists representing both groups.

Another character that can differentiate both groups is that the supportive scientists often have closer relations to the GM

[10] In fact, the scholars are not forming pro and con groups to the GM product. The perception toward GM product is an individual viewpoint of the scholars

product suppliers, but stay in distance with the NGOs. On the contrary, the cautious scholars are relatively not in close relation to the GM product suppliers, but close to the NGOs. The differences became more obvious when the transgenic cotton case enter the court. The supportive scientists were proposed by the defendants to be their expert witnesses (government and private company), whereas the cautious scientists became the expert witness of the plaintiff (NGOs Coalition). Both scientists also had equal opportunities to present their views on *Bt* cotton issue, in various fora either at local level (South Sulawesi) or at national level (Jakarta). Both of them form and shape the public opinion through seminars, discussions, public debates, and newspaper's articles. Table 7 depicts this situation.

The two opposition scientists has brought a significant influence to cotton farmers in South Sulawesi. As happenned to the scientists groups, farmers were also separated into two positions: for and against to *Bt* cotton. The "for" farmers believed that the transgenic cotton is a technological breakthrough that could elevate the economic prosperity. The "for" farmers became the dominant group in seven regencies where *Bt* cotton were developed. Meanwhile, the farmers who are opposed to *Bt* cotton refused the introduction of the transgenic cotton due to its potential negative impact to the environment and the famer's economic revenue.

Generally, the pro farmers possessed good social relations with government and company. Therefore, they were quite active in many actions to support transgenic cotton, both in local and national level. On the other hand, the contra farmers rarely joined or were involved in the contra actions at national level due to the limited facilities.

The analysis shows that the division of farmers into two opposite position are the reflection of two opposed interests among the GM product stakeholders at national level. The farmers became the battlefield of political-economic interest between the pros actor (government and private company) and the cons actor (NGOs).

Table 7 showed the presence of different fundamental views of two different scientists. This may be related to the differing principles held by the scientists, i.e. the developmentalism and the eco-justice principles. The more cautious/cons scientists are more noticing the economic issues and ecological impact, whereas, the supportive scientists are more focus in technical aspects of bio-safety and food safety. This is also clearly shown in the authorization procedure of GM products release, which never considers the economic aspect (farmer dependency to GM producer), including ethical and moral aspect. The release of GM product was solely given based only on document completion and legitimation, and also from results of bio-safety and food safety test, and performance test which is conducted by BFSTT and GEAP, as described in Chapter 4.

Table 7. Position of scholars towards GM product (including Bt cotton case)

Descriptions	Advocates	Challenger
Standpoint toward biosafety & food safety of the GM Products	GM products do not bring big risks to the biosafety & food safety	GM products should be biosafety & food safety, strictly applying the precautionary principles
Standpoint toward socio, economic, and ethical problems of the GM products	Basically, technology is free from values, more important to catch up with mastering the biotechnology	GM products will lead to economy dependency of the users to the trans national corporations
Expertise	Biology/biotechnology	• Biology/biotechnology • Social-Economic Sciences
Social distant with biotechnology companies	Relatively close	Relatively far
Social distant with NGOs	Relatively far	Relatively close
Involvement with transgenic cotton issue	• Involve in monitoring & evaluation team of Bt Cotton impacts • Attend seminar, discussion, public debate • Expert witness in court (proposed by the defendant)	• Send letter of concern to local parliament • Attend seminar, discussion, public debate • Expert witness in court (proposed by the plaintiff)

VI. CONCLUSION AND RECOMMENDATION

Significant Findings

The understanding of public participation in the context of development of biotechnology policy is "a process through which stakeholders -in particular users of GM products and indirectly affected groups or pressure groups- influence and share control over policy and decision making on GM product". Our study have identified the degree of involvement, challenges, obstacles and opportunity for public participation on the development of biotechnology policy and on the decision on specific activities of bio-safety and food safety matters (permits and license). Significant findings in this study are listed below.

First, in Indonesia, biotechnology development is influenced by three important factors: a) the political economic interests of each actor involved (government, private company, farmers and the research institute/university; b) knowledge on GM product and power (funds, networks, human resources, social capital) acquired by each actor involved; and c) policies and regulations regulate public participation in bio-safety and food safety.

Second, different actors have different participation levels. NGOs are significant actors who are intensely involved in the process of the development of biotechnology policy, and on the decisions on specific activities of bio-safety and food safety matters, followed by scholarss and farmers. The differences occur as a reflection of power relations between the actors involved.

Third, the type and intensity of public participation is not constant over time. It vigorously changes from time to time as the result of changing challenges and problems of GM products, political economic interest, and knowledge and power of each actor involved. In other words, public participation is the outcome of power relations between actors that framed, constructed and controlled under such policies and regulations within which the powerful actors inscribed their interests.

Obstacles

Considering the fact that the strengths and weaknesseses of public participation are a reflection of power relations among different actors involved, we identify the obstacles, opportunities and challenges to increase public participation. Three obstacles were met in enhancing public participation. The first, is related to structural matter, i.e. the present policy regulation (Joint Decree of Four Ministers) and the Government Regulation (Peraturan Pemerintah) which, just recently has been legalized by the President, does not provide enough room for public participation. The Government Regulation has not included two important subjects: access to all information, and public consultation regarding to import, limited release, release, and distribution of GM product.

The second obstacle is public awareness. Most consumers of GM products have not completely understood the risk issues, i.e. biosafety and food safety issues of GM products, including the potential economic dependence to GM producers. This becomes particularly important in the midst of the situation where consumers are merely focusing on cheaper price or higher crop productivity that they deem to be the most important aspects that should be considered beyond the bio safety and food safety issues. Under these circumstances, the role of NGOs becomes more important since no other actors are raising environmental concerns of the biotechnology products. The controversy of the limited released of *Bt* cotton in South Sulawesi would never have become open to public if NGOs were not involved from the beginning.

The third obstacle is the failure of government to implement good environmental governance. This condition, and the fact that there was no space for public participation under the existing regulation (see first obstacle), resulted in the situation where the public has no access on information related to the import, field trials and limited release and distribution of GM product. The *Bt* cotton case study in South

Sulawesi, clearly demonstrated this phenomena.

Opportunities

There are two important opportunities that can be used in order to strengthen public participation. The first opportunity is to attempt a wider space for public participation to be in effect, i.e under the Draft of Government Regulations (now the Government Regulation no 21/2005). At present, there are two important elements in public participation, which have not been clearly addressed in the Government Regulation; those are the access to information and public consultation. The Draft of the Law on Biosafety and Food Safety, which was initiated by the coalition of NGOs, is far more ahead in addressing both of the issues above compared to the Government Regulation. The second opportunity is the fact that public education, public campaign and advocacy supported by NGOs are a direct attempt to support biosafety and food safety and to protect the economic interest of the public, and not to oppose GM products without any valid and proper reasoning. Therefore, there is actually a great opportunity for other stakeholders (government, scholars, and private sectors) to have a constructive relationship with NGOs, who always been seen as opposing GM products.

Challenges

Considering the fact that opening more space for public participation is fundamentally strengthening the political power of the public in decision making on GM product, there are two big challenges for GoI regarding this matter: Is there a 'political will' from government to enhance public participation in decision making process? And if there is, how far will the government listen, conduct public consultation and respond in a responsible and consistent manner? This last matter directly relates to governance issue.

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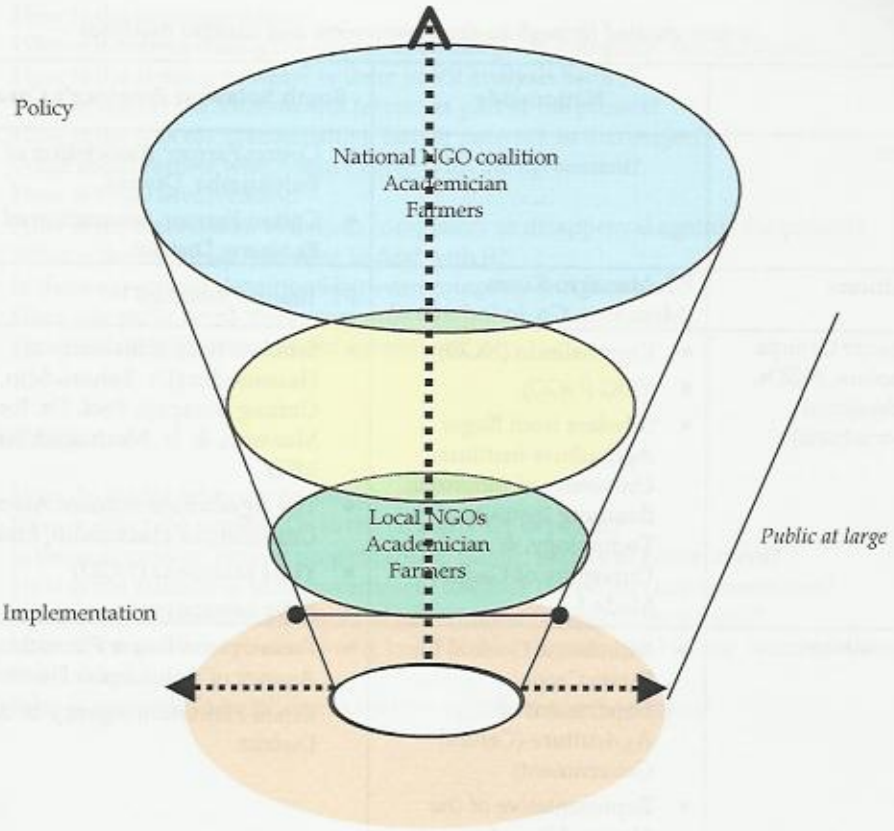
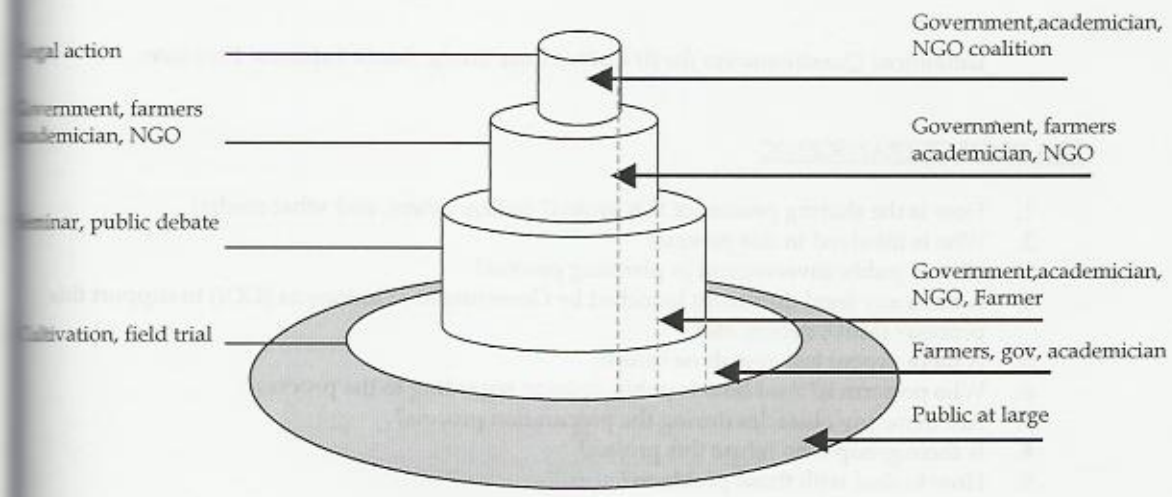
Appendix 1. Scaling up: Actors involved in transgenic issues in Indonesia.





Appendix 2. Actors Studied and Guidanced-Questionnaires used for In-depth Interview

Actors studied through in-depth interview and content analyses

	Nationwide	South Sulawesi Province's Case Study
Users	--	• Cotton Farmer Association of Bulukumba District • Cotton Farmer Association of Bantaeng District
Producers	PT. Monagro Kimia (Monsanto, Co. in Indonesia)	PT. Branita Sandhini [1]
Pressure Groups (Scholars, NGOs, Professional Associations)	• Konphalindo (NGO) • YLKI (NGO) • Scholars from Bogor Agriculture Institute, University of Indonesia, Bandung Institute of Technology, & University of Gadjah Mada [1]	• Scholars from University of Hassanudin (Dr. Baharuddin, Dr. Untung Surapati, Prof. Dr. Ibrahim Manwan, & Ir. Marhamah Nadir, MSi) • The Agriculture Student Association, University of Hasanudin, Makassar. • YLKI Makassar (NGO) • Fajar newspaper
Government	• Directorate General for Estate Crops, Department of Agriculture (Central Government) • Representative of the National Biosafety Framework	• Forestry and Estate Plantation Agency of Bulukumba District • Estate Plantation Agency of Bantaeng District

[1] Most of the information derives from the result of content analyses

Guidanced Questionnaires for Bt Cotton Case Study, South Sulawesi Province

PRA PROJECT TRANSGENIC

1. How is the sharing process of this project? (when, where, and what media)
2. Who is involved in this process?
3. How is public involvement in planning process?
4. Is there any legal document launched by Government of Indonesia (GOI) to support the process? (MoU, decree, etc)
5. Is there proper test ever done before?
6. Who perform it? And how is public opinion regarding to the process?
7. Are there any obstacles during the preparation process?
8. Is there group who refuse this project?
9. How to deal with those problems?

IMPLEMENTATION PROJECT TRANSGENIC

1. How is the implementation?
2. Who is involved during the implementation?(GOI, company, farmer, NGO)
3. How is the sharing process? Is there profit analysis before?
4. How to decide the location and farmer as part of the project?
5. How is the process in establishing farmer network in this project?
6. What about farmer who doesn't agree with the agreement?
7. How is NGO involvement?
8. How is the mechanism to deliver complaints or disapproval against the project?
9. What is the obstacle? And how to deal with it?
10. Is there agreement developed between company and farmers?
11. Does any party break the agreement?
12. How to deal with unsuccessful agreement?

MONITORING

1. How do media take part on this project?
2. Does it affect the project? Or to the farmers? Or to public?
3. Is there discussion among project farmer, public, and local government?
4. How is the attitude of local government towards the project implementation?
5. Are there documents made by local government related to the project?
6. How is the public aspiration being built? Public consultation? Public hearing? Or Workshop?
7. Who is responsible in following up new agreement in the project?

Appendix 3. Research and development of biotechnology in Indonesia (modified from Mulya *et al.*, 2003)

1. Transgenic Plants

No.	Type of Research/Topic	Institutions	Status
1.	Pest-resistant rice	Research Center for Biotechnology, LIPI	Biosafety Containment Test (BCT)
		Research Institute for Biotechnology and Genetic Resources (BALITBIOGEN)	Transgenic Plant (To)
	Disease-resistant rice (Blas)	Research Center for Biotechnology, LIPI	Transgenic plant (T3)
2.	Pest-resistant soybean	BALITBIOGEN	Transgenic plant (T3)
	Albumin contained soybean	Udayana University (UNUD)	Transgenic plant
	High-yield soybean	UNUD	Transgenic plant
3.	Virus-resistant groundnut	BALITBIOGEN	Transgenic plant
		Bogor Agricultural University (IPB)	Transgenic plantlet
4.	RR-corn (herbicide-resistant)	PT Monagro Kimia	Confined Field test (CFT)
	Bt-corn	PT Dupont	
4.	Disease-resistant Cabbage	Gadjah Mada University (UGM) and Airlangga University (UNAIR)	Transgenic plant
5.	Disease-resistant potato	IPB	Transgenic plantlet
6.	Delay ripening papaya	BALIBIOGEN	Transgenic plantlet
	Virus-resistant papaya	BALITBIOGEN	Transgenic plantlet
7.	High-yield sugarcane	Faculty of Agriculture IPB in collaboration with Center for Molecular Biology, BFE, Germany	Transgenic plant
		XI Governmental Plantation Co. (PTPN XI)	Transgenic plant
8.	*Bt*-cotton	PT Monagro Kimia (Monsanto Co)	Marketed in 2001 and 2002
	RR-cotton	PT Monagro Kimia (Monsanto Co)	CFT
	Herbicide-tolerant *Bt*-cotton	PT Monagro Kimia (Monsanto Co)	BCT
9.	Disease-resistant coffee	Indonesian Institute for Plantation Biotechnology (BPBPI)	Transgenic plant

Appendix 3. Continued

2. *Transgenic Microbes*

No.	Type of Research/Topic	Institutions	Status
1.	Over expression of protease gene in *E. coli*	Faculty of Agriculture, IPB	Transgenic microbes
2.	Over expression of thermophilic enzyme	Faculty of Mathematic and Natural Science, IPB	Mutant microbes
3.	Recombinant phytase expressing fungi	Rosindo Co.	Commercialized as Ronozyme-P for feed additive

3. *Gene Screening, Gene Detection and Marker, Molecular Characterization*

No.	Type of Research/Topic	Institutions	Status
1.	Polyhydroxy alcanoat (biodegradable plastic) gene	Research Center for Environment, IPB	Gene isolation
2.	Protease isolated from metagenomic libraries (soil DNA)	Faculty of Agriculture, IPB	Gene characterization
3.	Protease gene	Research Center for Biotechnology, IPB	Gene characterization
4.	Chitinase gene	BPBPI	Gene isolation
5.	Virus coat protein gene	UNS	Gene isolation
6.	Virus (CVPD)-resistant gene	UNUD	Gene isolation and characterization
7.	Map of QTL Local Chicken	UNDIP	Molecular mapping
8.	RAPD Polymorphisms of cow	UNS	Gene mapping
9.	Molecular marker for fish and molecular diversity of fish	Brawijaya University (UNIBRAW)	Molecular characterization
10.	16S gene libraries	Faculty of Mathematic and Natural Science IPB Faculty of Agriculture, IPB	Gene libraries
11.	Metagenomic libraries	Faculty of Agriculture, IPB	Metagenomic libraries from soil and sediment
12.	Detection of GMO in food and feed product	Saraswanti Indo Genentech Co.	Analytical laboratory
13.	ELISA-based detection of TBC	Indonesian Center for Biodiversity and Biotechnology (ICBB) in collaboration with Lionex GmbH, Germany	Marketed

Appendix 3. Continued

4. Enzymes and Antibiotic Research and Development

No.	Type of Research/Topic	Institutions	Status
1.	Protease enzymes	Research Center for Biotechnology, IPB	Development
2.	Enzymes production	Agency for Technological Assessment and Application (BPPT)	Small-scale Production
3.	Novel antibiotic against antibiotic multi-resistant human pathogens	Faculty of Agriculture IPB in collaboration with German Research Center for Biotechnology	Submitted for International Patent
4.	Antibiotic production	Research Center for Biotechnology, PUSPITEK	Development

5. Biofertilizer and Environmental Biotechnology

No.	Type of Research/Topic	Institutions	Status
1.	Rhizobium inoculants (Rhizo-Plus)	BALITBIOGEN and BPBPI	Marketed
2.	Plant growth promoting rhizosphere bacteria (EMAS)	BALITBIOGEN and BPBPI	Marketed
3.	Bacteria for Bioremediation of Petroleum Waste and Oil Sludge	Research Center for Environment, IPB	Marketed
4.	Bioremediation of Acid Rock Drainage	Research Center for Environment, IPB	Development
5.	Bioremediation of Mercury Contained Waste	Research Center for Environment, IPB	Development
6.	Bioremediation of Hexavalent-Chrome	Research Center for Environment, IPB	Development
7.	Bioremediation of heavy metals (Pb, Cd) containing waste	Research Center for Environment, IPB	Development

Appendix 4. Present and drafted regulations associated with release of genetically modified product into the environment (Mulya *et al*, 2003).

No.	Regulation	Aspects involved	Association with Seed
A. Present regulation			
		Law	
1	UU No. 6/67	Livestock and animal welfare	• Association with seed and other production needs released to environment • Seed, young animal, biological materials for animal
2	UU No. 9/85	Utilization and management of fishery resources	Release of new variety of fish
3	UU No. 5/90	Natural resources conservation	Animal and plant specimen and storage
4	UU No. 12/92	Plant cultivation system	Seed plants
5	UU No. 16/92	Quarantine system of animal, fish, and plant	• To avoid the expansion of animal and fish diseases also plant pest and diseases • Protection of animal, fish, and plant resources
6	UU No. 5/94	Biodiversity	Protection to biodiversity
7	UU No. 7/96	Food	Obligation to confirm foods or consumption goods which is genetically modified
8	UU No. 41/99 renewed by UU 19/2004	Forestry	Forest management with new variety of plants
9	UU No. 23/97	Environmental management	Biological environment
10	UU No. 29/2000	Protection of plant variety	Acknowledgement and appreciation of the intelectual property right of the new variety from genetically modified product

Appendix 4. Continued

No.	Regulation	Aspects involved	Association with Seed
	Government Decree		
1	PP 78/92	Production, distribution, and utilization of biologicaly material for animal	Production process uses modern biotechnology process
2	PP 6/95	Plant protection	Pest protection using natural enemies
3	PP 44/95	Plant seed	Import/export, release of plant new variety
4	PP 27/99	Environmental impact analysis	Environmental risk analysis
5	PP 69/99	Labelling and food advertising	Responsibility in labelling on each transgenic product
6	PP 29/2000	Animal quarantine	Prevent the circulation of quarantined animal diseases borne (animal and animal product)
7	PP 14/2002	Plant quarantine	• Prevent the circulation of plant pest borne • Quarantine
8	PP 15/2002	Fish quarantine	• Prevent the circulation of fish diseases borne • Quarantine
	Ministerial Decree		
1	Joint Decree 4 ministers No. 998.1/Kpts/OT.210/9/99 790.a/Kpts-IX/1999 1145A/MENKES/SKB/IX/1999 015A/NmenegPHOR/09/1999	Bio-safety and Food safety	Procedure of bio-safety and food safety assessment
2	Kepmentan No. 737/Kpts/TP.240/9/98 Perubahan Kepmentan No. 902/Kpts/TP.240/12/96	Testing, reviewing, and release of variety	Procedure and requirement of testing, reviewing, and release of variety
3	Kepmentan No. 26/KPTS/OT.210/1/1998	Import of fish fry	Import of fish seed as GM product should exceed bio-safety evaluation

Appendix 4. Continued

No.	Regulation	Aspects involved	Association with Seed
B. Proposed regulation			
1	RUU Genetic resource management	Utilization and preservation of genetic resource	Plant, animal, fish, microbe from GM product
2	RUU for Cartagena protocol establishment	Arrangement of the traffic boundary for LMO and GMO countries	Import-export, trAding interchange for transgenic products
3	RUU in established International agreement on plant genetic resources for food and agriculture		
4	RPP for GM product safety	Improvement, insertion, and utilization of animal, fish, plant, and microbe as GM product	Bio-safety, food safety
5	Draft Manual	Food safety assessment	Food assessment procedure
6	Draft Manual	Cattle feed safety assessment	Cattle food assessment procedure

Appendix 5. Compilation of Articles and News of Indonesian Newspaper regarding Biotechnology, 2000 – 2004

No	Newspaper & Dates	Tittle	Topic of Article
		2000	
1	Jakarta Post, 31 January 2000	Global pact on genetically modified goods reached	A & B
2	Kompas, 2 February 2000	Deptan bantah telah lepas tanaman transgenik	A & B
3	Kompas, 3 February 2000	Organisme transgenik harus dipertimbangkansaksama	B
4	Kompas, 3 February 2000	Lima peluang bagi Indonesia dari hasil pertemuan rekayasa genetika dunia	E
5	Kompas, 5 February 2000	Aktivis antibioteknologi lakukan agiatas keamanan pangan transgenil:	B & C
6	Pembaruan, 8 Fe burari 2000	Meneg LH: Hati-hati lepas produk rekayasa geneitika	A & B
7	Pembaruan, 9 February 2000	Perlu UU Hak paten Bioteknologi	A
8	Kompas, 14 February 2000	Ratifikasi Biosafety Protocol untuk lindungi kenakaan hayati	A & B
9	Pembaruan, 14 February 2000	Protokol cartagena, senjata hadapi produk transgenik	A & B
10	Republika, 21 February 2000	Perlu, informasi produk Rekayasa Genetika	A & B
11	Warta Kota, 21 February 2000	Produk Pangan Transgenik dibicarakan	A
12	Kompas, 22 February 2000	Indonesia akan ratifikasi protokol Kaamanan hayati	A
13	Pembaruan, 22 February 2000	Indonesia siap ratifikasi biosafeti protocol	A
14	Jakarta post, 8 March 2000	LIPI : Nothing to fear from genetically modified food	B
15	Kompas, 23 March 2000	Keamanan produk Rekayasa Genetika Sejak awal sudah jadi polemik	B
16	Kompas, 28 March 2000	Indonesia hadapi dilema penggunaan produk transgenik	B
17	Jakarta pos, 30 March 2000	Delay Sighning protocl on biosafety: NGO	A
18	Pembaruan, 30 March 2000	Kaji Ulang SKB tentang keamanan produk rekayasa geneitka	A
19	Konsumen, 1 April 2000	Kontroversi bioteknologi dan hak konsumen	A & B
20	Pembaruan, 10 April 2000	Tanaman Bioteknologi Perlu dikembangkan	B
21	Pembaruan, 30 Arpil 2000	Produk Makanan Bioteknologi laik konsumsi	B
22	Jakarta pos, 12 April 2000	Hira: Foodstuffs with GMOs need labeling	A & B
23	Kompas, 21 June 2000	Beri label produk rekayasa genetika	A & B
24	Pembaruan, 12 August 2000	Bioteknologi, Solusi mengatasi kesulitan pangan dunia	A & B
25	Kompas, 18 August 2000	Balitbio Bogor Lakukan Penelitian Transgenik	
26	Kompas, 18 August 2000	Pengembangan pangan transgenik, Sikap Indonesia masih mendua	B & C
27	Kompas 18 August 2000	Bioteknologi Pertanian, Peluang ataukah ancaman	B & C
28	Kompas 18 August 2000	Pertanian transgeniak diharapkan jadi Revolusi Hijau Kedua	B & C & D
29	Media Indonesia, 29 Agust 2000	Produk Transgenik supaya dihentikan	A

No	Newspaper & Dates	Tittle	Topic of Article
30	Pembaruan, 29 August 2000	Ekses Tanaman Transgenik Perlu dibuktikan	A & B
31	Kompas, 30 August 2000	Soal Tanaman dan produk transgenik, pemerintah harus transparan	A
32	Republika, 30 August 2000	Meluas, Ujicoba Lapangan Tanaman trasngenik	A
33	Pembaruan, 31 August 2000	Protokol Cartagena bukan untuk membendung teknologi	A & B
34	Jakarta Post, 1 September 2000	RI wary over crops altered genetically	B
35	Media Indonesia, 1 Sept 2000	Sonny Dukung penghentian ujicoba transgenik	A & B & C& D
36	Jakarta Post, 1 September 2000	NGOs query genetically modified crops	A & B
37	Kompas, 1 September 2000	Protokol Keamanan Hayati amankan "hantu Malthus"	B
38	Pembaruan, 2 September 2000	Benih Transgenik belum dipasarkan	A
39	Pembaruan, 4 September 2000	Pro-Kontra Produk Transgenik	A & B
40	Pembaruan,5 September 2000	Penolakan Pangan transgenik akibat misconception	B & C
41	Kompas, 5 September 2000	LIPI kembangnkan padi transgenik tahan hama	
42	Kompas., 6 september 2000	Pengembanganm transgenik harus hati-hati	B & C & D
43	Media Indonesia, 6 Sept 2000	Kendati kontraversial, produk transgenik tak bisa lagi ditolak	B
44	Media Indonesia, 6 Sept 2000	Deptanhut belum melepas tanaman benih jagung Bt	A
45	Pembaruan, 6 September 2000	Biodivesity Indonesia kesempatan menyusul kemajuan bioteknilogi dunia	A & B
46	Bernas, 7 September 2000	Bahaya produk transgenik yang ditutup-tutupi	A & B
47	Kompas, 9 September 2000	Kapas transgenik dipasarkan di Indonesia, meski masijh kontrocersial	A
48	Republika, 9 September 2000	Keputusan Soal Kapas Transgenik, 45 LSm sesalkan menko perekonomian	A
50	Pembaruan, 10 September 2000	Masih lemah, hukum pengemnbangan bioteknologi	A
51	Jakarta Post, 11 September 2000	Transgenik tenchnologies draws controversy	B
52	Kompas, 11 September 2000	Terhadap bioteknologi Sikap Zero Tolerance tidak menguntungkan	B
53	Republika, 12 September 2000	Kampanye Anti Bidoteknilogi tidak fair	B
54	Permbaruan, 12 September 2000	Walhi Protes rencana penanaman kapas transgenik	A & C
55	Bisnis Indonesia, 13 Sept 2000	Pemerintah tak anti rekayasa genetika	A & B
56	Jakarta Post, 13 September 2000	Deal on transgenic cotton seeds delayed	A
57	Kompas, 13 September 2000	Meneg LH : Batalkan Kerjasama transgenik	A
58	Republika, 13 September 2000	Hingga Selesai Ratifikasi Protokol Cartagena : Pengembangan Transgenik Tertutup	A
59	Suara Karya, 13 September 2000	Pengembangan Kapas Transgenik dengan AS ditunda	A
60	Jakarta Post, 15 September 2000	Monagro Go Ahead with plan on transgenik cotton	A & C
61	Kompas, 15 September 2000	Debat ilmiah tentang rekayasa genetika	A & B & C

No	Newspaper & Dates	Tittle	Topic of Article
62	Kompas, 15 September 2000	Petani Minta agar bisa kembangkan kapas transgenik	C
63	Republika, 16 September 2000	DPR: Pemerintah jangan apriori pada produk transgenik	A
64	Kompas, 17 September 2000	Padi transgenik, harapan di tengah kontroversi	E
65	Warta Ekonomi, No.18, 17 Sept 2000	Awas Transgenik lahirkan monster	B & D
66	Detak No.112 September 2000	Panen Kapas yang bikin cemas	A & B
67	Pembaruan, 19 September 2000	Penolakan GMO bukan pada teknologinya	C
68	Kompas, 20 September 2000	Kapas transgenik rentan wereng	B
69	Media Indonesia, 25 September 2000	Menristek soal ribut-ribut tanaman transgenik: Masyarakat perlu aturan tegas	A & B
70	Kompas, 29 September 2000	Sulsel akan tambah areal pertanaman kapas transgenik	B
71	Republika, 29 September 2000	Kontroversi tanaman super, Penjajahan Melalui Tanaman transgenik	C
72	Republika, 30 September 2000	Benih Kapas ternyata sudah dijual	C
73	Pembaruan, 30 September 2000	Perlu Pembatasan aplikasi tanaman transgenik	A & B
74	Pembaruan, 25 September 2000	Teknik Hibrida tingkatkan produktivitas jagung	C
		2001	
1	Republika, 8 February 2001	Kapas transgenik bisa dilepas	B
2	Kompas, 8 February 2001	Kapas transgenik di Sulsel ditengarai langgar peraturan	A
3	Media Indonesia, 9 February 2001	LSM minta Moratorium : penelitian transgenik harus berlanjut	A
4	Kompas, 10 February 2001	Kapas transgenik di sulawesi selatan, Ujicoba kok 500 hektar	A
5	Kompas, 10 February 2001	Kebal ulat buah, rentan wereng coklat	B
6	Perublika 12 February 2001	Wapres : Pengembangan transsgenik tak boleh langgar nilai agama	D
7	Pedoman rakyat, 14 February 2001	Menteri pertanian izinkan pengembangan kapas transgenik di Sulsel	A
8	Kompas, 15 February 2001	Penanaman kapas transgenik diperluas di lima kabupaten	E
9	Kompas, 16 February 2001	Disayangkan, keluarnya SK mentan soal kapas transgenik	A
10	Media Indonesia, 17 February 2001	Soal transgenik, sonny minta tetap hati-hati	A
11	Pembaruan, 19 February 2001	Bioteknologi, Ibarat buah simalakama	A & B
12	Pembaruan, 20 February 2001	Kebijakan tanaman kapas transgenik hanya berlaku setahun	A
13	Kompas, 22 February 2001	Ditolak, pelepasan kapas transgenik	C
14	Terbit, 23 February 2001	Bioteknologi hanya dikuasai pihak tertentu	C
15	Kompas, 23 February 2001	Surat keputusan mentan dinilai manipulatif	A
16	Media Indonesia, 23 February 2001	Lagi, ribut soal kapas transgenik: 4 LSM tolak SK Mentan	B
17	Bisnis Indonesia, 23 February 2001	Pelepasan kapas transgenik dikecam	A
18	Terbit, 23 February 2001	LSM tolak kapas transgenik	A

No	Newspaper & Dates	Tittle	Topic of Article
19	Berita buana, 28 February 2001	Deptan tantang LSM gugat SK mentan	A
20	Pembaruan, 26 February 2001	Menyoal tanaman transgenik	E
21	Republika, 26 February 2001	Pro-kontra transgenik haruskah berujung ke pengadilan ?	A
22	Kompas, 1 March 2001	LSM di Bulukumba tolak kapas transgenik	A
23	Kompas, 2 March 2001	Empat ornop boikot pertemuan tentang kapas transgenik	A
24	Republika 6 March 2001	Kapas transgenik, dicerca atau dinanti ?	E
25	Kompas, 9 March 2001	Soal, produk transgenik, Perlu badan nasional bioteknologi	A
26	Kompas, 10 March 2001	Pro Kontra kapas transgenik Perang tanding daud lawan goliat	E
27	Media Indonesia, 12 March 2001	Kotak Pandora Rekayasa Genetika	A & B
28	Kompas, 16 March 2001	40 Ton benih kapas transgenik tiba di Makassar	E
29	Kompas, 17 March 2001	Soal kapas transgenik yang kita cari solusinya bukan kontroversinya	E
30	Kompas, 20 March 2001	Mentan tetap akan digugat ke PTUN	A
31	Kompas, 22 March 2001	Soal kapas transgenik DPR dihimbau minta penjelasan mentan	A
32	Kompas, 23 March 2001	Kapas transgenik setelah setahun akan dievaluasi	A
33	Kompas, 28 March 2001	Petani siapkan class action penanaman kapas transgenik	A & B & C
34	Media Indonesia, 28 March 2001	Ujicoba kapas bt dinilai gagal: produk transgenik ancam lingkungan	B
35	Kompas, 31 March 2001	Soal kapas transgenik Ornop kirim surat protes ke pangdam wirabuana	A
36	Pembaruan, 1 April 2001	Pemerintah abaikan bahaya pangan transgenik	A
37	Pembaruan 15 April 2001	Prinsip kehati-hatian perlu dirumuskan	A & B
38	Kompas, 17 April 2001	Perlu kearifan menyikapi produk tanaman transgenik	D
39	Pembaruan, 17 April 2001	FSPI tolak tanaman transgenik	B
40	Kompas, 17 April 2001	Ratusan petani tolak kapas transgenik	A
41	Pembaruan, 18 April 2001	Izin kapas transgenik atas desakan petani	E
42	Kompas, 18 April 2001	Palaguna: Saya siap stop kapas transgenik	A
43	Koran tempo, 24 April 2001	Sekusut serat kapas	E
44	Republika, 4 May 2001	Resiko produk transgenik terhadap kesehatan	B
45	Kompas, 5 May 2001	Enam ornop gugat mentan ke PTUN	A
46	Pembaruan, 5 May 2001	Mentan digugat ke PTUN	A
47	Kompas, 23 May 2001	Indonesia Rawan produk transgenik	B
48	Republika, 23 May 2001	Bupati Bantaeng: Kapas transgenik banyak diminati	C
49	Kompas, 25 May 2001	Belum ada kesepakatan soal moratorium transgenik	A

No	Newspaper & Dates	Tittle	Topic of Article
50	Kompas, 30 May 2001	Menyikapi kehadiran rekayasan genetika, Jangan tinggalkan suaran masyarakat	C
51	Kompas, 31 May 2001	Pro dan kontra soal rekayasa genetika : Perlu informasi jujur untuk tentukan sikap	B
52	Kompas, 23 June 2001	Kapas transgenik terserang hama	B
53	Kompas, 13 June 2001	Produk transgenik belum bisa dilepaskan ke masyarakat	A
54	Kompas, 6 July 2001	Penerapan Bioteknologi berlum mendapat perhatian	B
55	Jakarta post, 17 July 2001	Pros dan cons of transgenic cotton continue in S. Sulawesi	B
56	Republika, 22 July 2001	Kapas transgenik bukan kapas sakti	B
57	Diplomat, No. 26 17-31 June 2001	6 LSM gugat menteri pertanian di PTUN jakarta	A
58	Pembaruan, 23 June 2001	Program kapas transgenik akan dihentikan	B
59	Pembaruan, 27 June 2001	Perlu kajian ilmiah sebelum hentikan program kapas transgenik	B
60	Fajar, 9 August 2001	Polisi tangkap aktivis kontra kapas transgenik	A
61	Kompas, 13 August 2001	Produksi kapas transgenik tak penuhi target	C
62	Pembaruan, 16 August 2001	Pemerintah tangani delima kapas transgenik	A
63	Kompas, 26 August 2001	Harga benih kapas transgenik naik dua kali lipat	C
64	Kompas, 3 September 2001	Prof daud Silalahi SH: Penanaman kapas transgenik tak wajib amdal	A
65	Kompas, 8 September 2001	Penanaman kapas transgenik di Polmas langgar SK mentan	A
66	Republika. 9 September 2001	Peneliti IPB: Kapas transgenik aman bagi lingkungan	B
67	Koran tempo, 14 September 2001	Petani Bulukumba bakar kapas transgenik	A & C
68	Kompas, 15 September 2001	Petani bakar ladang kapas transgenik	C
69	Pembaruan, 15 September 2001	Ladang kapas transgenik di bakar	C
70	Bisnis Indonesia, 19 September 2001	Penanaman kapas transgenik diteruskan	A
71	Republika 20 September 2001	Direkayasa, pembakaran kapas transgenik di Bulukumba	A
72	Kompas, 21 September 2001	Monagro siap kembangkan kapas transgenik di Jawa	A
73	Pembaruan, 21 September 2001	Impor kapas layak bebas PPN	A
74	Kompas, 29 September 2001	Meneg LH : Segera keluarkan PP tentang produk transgenik	A
75	Kompas, 1 October 2001	Kapas transgenik bukan dibebaskan terus	A
76	Pembaruan, 7 October 2001	Produk hasil rekayasa genetik masih kontroversi	A
77	Kompas, 10 October 2001	Hati-hati tanggapi produk rekayasa genetika	C
78	Pembaruan, 24 October 2001	Edukasi publik perlu agara hasil bioteknologi bisa dimanfaatkan	B
79	Republika, 25 October 2001	Pakar menilai harus ada UU tanaman transgenik	A

No	Newspaper & Dates	Tittle	Topic of Article
80	Republika, 30 November 2001	Membeli saham perusahaan rekayasa genetik, bolehkah?	D
81	Pembaruan, 6 November 2001	Pemerintah perluas aral kapas transgenik	E
82	Media Indonesia, 15 December 2001	Para petani tidak sejahtera: Produk tanaman transgenik merusak lingkungan	B & C
		2002	
1	Koran Tempo, 30 January 2002	Izin menteri pertanian sudah keluar : Kapas transgenik ditanam lagi	A & B
2	Republika, 31 January 2002	Kapas transgenik bt ditanam kembali di sulsel	A
3	Kompas, 8 February 2002	Ditemukan produk makanan mengandung bahan transgenik	B
4	Kompas, 11 February 2002	Transgenik yang dikhawatirkan	B
5	Kompas, 26 February 2002	Produk transgenik di Indonesia belum terkontrol	A & B
6	Pembaruan, 26 February 2002	Keamanan Pangan hasil rekayasa genetika belum dibakukan	B
7	Republika , 27 February 2002	Perlu Lembaga pengawas bahan mentah rekayasa genetika	A
8	Kompas, 6 March 2002	Pemerintah bersikap hati-hati mengembangkan tanaman transgenik	A
9	Kompas, 5 March 2002	Diperluas, penanaman kapas transgenik	E
10	Kompas, 8 March 2002	Petani siapkan class action penanaman kapas transgenik	A & B
11	Pembaruan, 9 March 2002	Bioteknologi mendukung keanekaragaman hayati	B
12	Kompas, 21 March 2002	Monsanto tawarkan jagung transgenik, setelah kapas transgenik	A & C
13	Kompas, 22 March 2002	Soal jagung transgenik-Palaguna : kita masih berani memulai	B
14	Fajar, 23 March 2002	Prinsip kehati-hatian harus tetap dijaga	B & C
15	Fajar, 23 March 2002	Dari diskusi satu tahun transgenik, siapa yang untung : prinsip kehati-hatian harus tetap dijaga	A & B & C
16	Koran tempo, 23 March 2002	Petani sulsel toalk jagung transgenik	B & C
17	Pedoman rakyat, 25 March 2002	Nasib transgenik di Sulsel : Kapas Bt belum tuntas, masuk jagung RR	A & B
18	Media Indonesia, 28 March 2002	Ujicoba kapas Bt dinilai gagal: produk transgenik ancam lingkungan	A & B
19	Republika, 30 March 2002	Produk genetika dibatasi lima persen	A
20	Kompas, 1 April 2002	Dikaji, keamanan pangan hasil rekayasa genetika	A
21	Pembaruan, 2 April 2002	Dampak tanaman transgenik masih diteliti	A & B
22	Kompas, 4 April 2002	Kekhawatiran tentang kapas transgenik tak beralasan	C
23	Republika, 5 April 2002	Areal kapas trangenik di sulsel bakar 8.000 hektar	E
24	Fajar, 6 April 2002	Permodel resistensi hama untuk kapas transgenik	B
25	Pembaruan, 8 April 2002	Kapal Transgenik tetap di pantau	A & C
26	Pembaruan, 8 May 2002	Bioteknologi, kekayaan masa depan indonesia	B
27	Koran Tempo, 10 April 2002	Lipstik untuk dewi Sri	B

No	Newspaper & Dates	Tittle	Topic of Article
28	Kompas, 10 April 2002	Areal produk transgenik meningkat	E
29	Republika, 10 April 2002	Tim pemantau kapas transgenik bakal gugat sejumlah ornop	A
30	Kompas, 15 April 2002	Pengembangan kapas transgenik si sulawesi selatan : Bak Anjing menggonggong, kafilah berlalu	A
31	Kompas, 15 April 2002	Pilih kepentingan perut atau lingkungan	B & C
32	Kompas, 15 April 2002	Setelah kapas, jagung lalu apa lagi ...?	E
33	Republika, 22 April 2002	Kapas transgenik memberi solusi atau menjual harapan	B & C
34	Fajar, 29 April 2002	Warga jeneponto serbu kantor KGP	A
35	Demos, no 163 April 2002	Pro-kontra Setelah kapas, kini jagung transgenik	B
36	Demos, no 163 April 2002	Jeneponto dan sinjai gagal kembangkan kapas transgenik	A
37	Demos, no 164 April 2002	Prinsip kehati-hatian masih diperlukan	B
38	Demos, no 163 April 2002	Produktivitas rendah, monsanto menggandeng bisnis dan pestisida	A & C
39	Republika, 16 May 2002	Biteknolologi Harus lindungi biodiversity	B & C
40	Kompas, 22 May 2002	Padi transgenik agar tahan kekeringan dan hama	B
41	Pembaruan 14 July 2002	Indonesia, Pusat bioteknologi ASEAN	E
42	Kompas, 18 July 2002	Diteliti, keamanan pangan jagung dan kedelai rekayasa genetika	B
43	Republika, 24 July 2002	Jahe dan lengkuas pun naik daun berkat bioteknologi	E
44	Pedoman rakyat, 5 August 2002	Produksi kapas ditargetkan 67.000 ton	C
45	Kompas, 13 August 2002	Kapas transgenik risaukan petani bulukumba	B & C
46	Pembaruan, 19 August 2002	Kapas transgenik kurangi pemakaian pestisida	B
47	Republika, 1 September 2002	Dibalik kecaman terhadap tanaman transgenik	B & E
48	Pembaruan, 1 September 2002	Pilih mana, kapas transegenik atau kanesia 7?	A & C
49	Kompass, 25 September 2002	Komisi bietika nasional pelu dibentuk	A
50	Pembaruan, 3 September 2002	Pangan transgenik aman dikonsumsi	B
51	Media Indonesia, 16 September 2002	Ilmu biomolukuler harus didasari moral	D
52	Media Indonesia, 20 November 2002	Gen transgenik cemari kapas lokal	B
53	Jakarta post, 21 November 2002	Local cotton affected by genetically modified crop	B
54	Kompas, 24 November 2002	Tidak gampang kelola tanaman transgenik	A
55	Republika, 24 December 2002	Makanan masa depan	B
56	Republika, 26 December 2002	Sekilas rekayasa genetika	B
57	Republika, 26 December 2002	Transgenik, pilihan atasi kekurangan pangan	B & C

No	Newspaper & Dates	Tittle	Topic of Article
		2003	
1	Kompas, 4 January 2003	LIPI kemnbangkan tanaman rekayasa genetika untuk menghasilkan vaksin	E
2	Pembaruan, 6 January 2003	Pangan Hassil Rekayasa Genetika lebih baik	B
3	Pembaruan, 6 January 2003	Tanaman transgenik bisa timbulkan polusi gen ?	B
4	Pembaruan, 12 January 2003	Bioteknologi Indonesia baru menuju gelombang kedua	E
5	Republika, 14 February 2003	Jepang teliti beras transgenik	B
6	Pembaruan, 16 February 2003	Kedelai transgenik dari dan untuk indonesia	B & C
7	Pembaruan, 11 March 2003	Tanaman Transgenik untuk obat-obatn mulai marak	B
8	Kompas, 19 March 2003	Segera pasang label produk rekayasa Genetika	A
9	Kompas, 11 April 2003	Pemerintah harus hentikan izin komersialisasi produk transgenik	A & B
10	Sinar Harapan, 3 July 2003	Proyek bioteknologi Rockefeller dan Mcnight: Mengurangi beban lisensi atau perluasan pasar transgenik	A
11	Sinar harapan, 6 April 2003	Produk bioteknolgi butuh aturan jelas	A
12	Media Indonesia, 2 August 2003	Pulau rempang akan dijadikan Bioisland	E
13	Pembaruan, 10 September 2003	Menyoal pengembangan tanaman pangan di Indonesia:Pengembangan genomik pada padi kini perlu diriset	E
14	Pembaruan, 3 October 2003	Vaksin dalam kentang	B
15	Media Indonesia, 3 October 2003	Bioisland segera dibangun di Pula Rempang	E
16	Pembaruan, 6 October 2003	Bioterorisme hambat penelitian	B
17	Pembaruan, 9 October 2003	Pengembangan bioisland jangan kejar komersialisasi	E
18	Jakarta post, 9 October 2003	Five foreign firm eye RI biotech centers	A
19	Kompas, 16 October 2003	Memasuki era Biotek lewat Bioisland	A & B
20	Republika, 18 October 2003	Kontroversi berkelanjangan	A
21	Jakarta post, 12 November 2003	Vatican gather scientists to debate biotech foods	C
22	Republika, 18 November 2003	Hitam putih transgenik	B
23	Kompas, 11 December 2003	Sisi buram produk Bioteknilogi	B & C & D
		2004	
1	Pembaruan, 4 January 2004	Menanti lahrinya kerjasama pakar bioteknologi Pertanian	B
2	Media Indonesia, 12 February 2004	Sehat dengan rekayasa genetika	B
3	Media Indonesia, 18 February 2004	BATAN hasilkan padi varietas tahan hama	B
4	Pembaruan, 22 February 2004	Lahan tanaman transgenik meningkat	E

No	Newspaper & Dates	Tittle	Topic of Article
5	Republika, 16 May 2004	Jagung Transgenik masih kontroversi	B
6	Kompas, 22 May 2004	Label produk pangan transgenik tak kunjung terwujud	A & B
7	Kompas, 28 May 2004	Mengantisipasi pangan transgenik	A & B & C & D
8	Kompas, 28 May 2004	Widyakarya Nasional Pangan dan Gizi VIII : Menjembatani Kesenjangan ketersediaan dan akses pangan	C
9	Media Indonesia, 7 July 2004	Komisi I DPR setuju ratifikasi RUU protokol Cartagena	A & B
10	Kompas, 7 July 2004	Indonesia perlu segera meratifikasi protokol Keamanan Hayati	A & C
11	The Jakarta Post, 7 July 2004	House discusses new genetic protocol	A
12	Pembaruan, 8 July 2004	Segera ratifikasi protokol cartagena untuk keamanan hayati	A
13	Kompas, 8 July 2004	Monsanto khawatirkan ratifkasi protokol tentang keamanan hayati	B & C
14	Jakarta post, 12 July 2004	Indonesia to ratify bio-tech protocol	A & C
15	Kompas, 16 July 2004	Ratifikasi protokol cartagena akan disahkan hari ini	A
16	Media Indonesia, 16 Jul 2004	Protokol Cartegena diratifikasi DPR saat ini	A
17	Pembaruan, 7 July 2004	RUU Keanekaragaman hayati siap jadi undang-undang	A
18	Kompas, 4 August 2004	Bioteknologi Pertanian Harapan bagi si Miskin	C
19	Kompas, 28August 2004	Riset transgenik untuk atasi maalah pangan	B
20	Koran Tempo, 2 October 2004	Teknologi microarray DNA	E
21	Koran Tempo, 22 October 2004	Manusia setara cacing gelang	E
22	Kompas, 29 October 2004	Deptan belum akan kembangkan padi transgenik hingga 2009	E

Topic of articles/news (including *Bt* cotton issue) in Indonesian newspaper, 2000 - 2004
A. Regulation weaknesses, policy transparency, corruption & collusion, & public participation
B. Biosafety issue and risk of Bt cotton
C. Economic issues of Bt Cotton i.e. economic returns, economic dependency and potential losses
D. Moral and ethical issues
E. Could not classify

Appendix 6 Topic of article & position of scholars according to his/her writtings in newspaper

Appendix 6. Topic of article & position of scholars according to his/her writtings in newspaper

No	Author	Date & Source	Tittle	Category of topic	Category of scientist
1	Bj Habibie	Pikiran Rakyat, 1997	Bioteknologi sebagai andalan pembangunan	E	1
2	Joko Budianto	Jakarta, 21 June 1999	Pemamfaatan gen berasal dari luar species dgn teknik rekayasa genetika	B	1
3	Sumarno	Jakarta, 21 June 1999	Prosedur penelitian keamanan hayati varites tanaman transgenik	A/B	1
4	Antonius Suwanto	Kompas, 4 February 2000	Menyikapi tanaman transgenik	B	1
5	Antonius Suwanto	2000	Tanaman transgenik bagaimana kita menyikapi	A	1
6	Bambang Ariaji	Jakarta, 23 November 2000	Teknologi trangenik dalam perspektif kebijakan pertanian. Analisis dampak, implikasi teknis dan kelembagaan	A/B	2
7	Christ Mboeik	Pembaruan, 11 September 2000	Persaingan bisnis dibalik penolakan tanaman trasngenik	B/C	2
8	Hari Hartiko	Jakarta, 23 November 2000	Implementasi Teknologi Transgenik di Indoneisa	B/C	3
9	Hira jhamtani	Peper, 16 November 2000	Regulasi international mengenai transgenik :Perlunya prinsip kehati-hatian	A/B	3
10	Hira Jhamtani	Managemen, September 2000	Industrialsisasi Kehidupan Abad ke 21 Melalui Rekayasa Genetika	C	3
11	Irwan Prayitno	Jakarta, 16 November 2000	Transgenik dan regulasi di Indonesia, Diskusi sehari Telaah hukum	A	2
12	Kartika Adiwilaga	Jakarta, 5 September 2000	Isu keamanan pangan dan lingkungan tanaman hasil rekayasa geneitka :, seminar bioteknologi, BPPT.	B	1
13	Otto Sumarwoto	Pembaruan, 9 October 2000	Mengelola resiko lingkungan organisme transgenik	B/C	2
14	PAN indonesia	Paper, 7 March 2000	Paten	C	3
15	Riza V T	Paper, 23 November 2000	Peredaran tanaman trangenik saat ini dan konsekuansi thd masyarakat	B/C	3
16	Soefjan Tsauri (LIPI)	Pembaruan 7 March 2000	Hindari Debat Berkepanjangan Soal Teknologi Transgenik	A/B	1
17	Sugiono Moeljoprawiro	Jakarta, 30 August 2000	Kekhawatiran terhadap organiasme transgenik dan pengkajian keamanan	B	1

No	Author	Date & Source	Tittle	Category of topic	Category of scientist
2001					
18	Agnes Aristiarini	Kompas, 18 December 2001	Bersiap hadapi transgenik	A/B	2
19	Antonius Suwanto	Republika, 1 December 2001	Jangan Bete karena kapas Bt	B	1
20	Asdep Kajian Dampak Lingkungan-KLH	Paper, 2001	Mekanisme pertisipasi publik : suatu contoh penerapan dalam proses amdal	B	2
21	Bintoro Gunadi	Kompas, 16 Sept ember 2001	Revolusi Hijau babak kedua	A/B/C	3
22	Bintoro gunadi	Kompas, 12 August 2001	Bt 100 tahun : tetap kontroversi	B	3
23	D Andreas	Kompas, 22 April 2001	Bioetika	D	3
24	Damayanti Buchori	Republika, 28 February 2001	Dapatkah Transgenik atasi masalah hama ? tanggapan atas pro-kontra tanaman transgenik	B	3
25	Damayanti Buchori	Republika, 1 March 2001	Dapatkah Transgenik atasi masalah hama ?	B	3
26	D. Andreas S	Kompas, 25 February 2001	Analisis resiko lingkungan tanaman transgenik	B	3
27	Dr.Ir. SHM Tampubolon	Pembaruan, 27 June 2001	Agrotransgenik, bagaimana sikap indonesia ?	E	2
28	FG. Winarno	Pembaruan, 2 February 2001	Terapi genetik dan peta genom Manusia	B	1
29	Fifi Fitriayh Masduki,	Kompas, 25 February 2001	Mencari Tanaman Transgenik Ramah Lingkungan	B	2
30	Hari Hartiko	Trawas, 22 September 2001	Organisme Transgenik, Tinjauan Manfaat dan Resiko	B/C/D	3
31	Is Helianti	Kompas, 26 August 2001	Perang terhadap produk rekayasa genetika, haruskah?	E	1
32	Konphalindo	Paper Draft PP biosafety, 2001	Challenges for reforming the non democratic and manipulative decision making process to develop biosafety policy.	A	3
33	Posman Sibuea	Pembaruan, 2 May 2001	Bioteknologi dan kecemasan terhadap tanaman transgenik	B	1

No	Author	Date & Source	Tittle	topic	scientist
34	R Ristyantoro	Pembaruan, 6 October 2001	Etika dan bioteknologi	D	2
35	Sjamsoe'oed Sadjad	Kompas, 6 April 2001	Benih yang komersial	C	2
36	Sumedi (wartawan)	Pembaruan, 5 March 2001	Jangan terkecoh kehebatan tanaman kapas transgenik	A	3
37	Trastoto Handadari	17 April 2001 kompas	Perlu kearifan menyikapi produk tanaman transgenik	E	2
			2002		
38	Thomas Koten	Pembaruan, 1 Des 2002	Kloning manusia dan rahim perempuan	D	3
39	Neni Utami Adiningsih	Pembaruan, 5 March 2002	Produk transgenik dan Perlindungan konsumen	A/B/C	3
40	Lanjar Sumarno	Republika, 12 April 2002	Class action atas GMO, Suatu kecerdasan	B/C	1
41	Dwi Andreas Santosa	Kompas, 23 agus 2002	Biopolitik dan tanaman/ Pangan transgenik	C	3
42	K Bertens	Pembaruan, 23 Nov 2002	Pangan Transgenik dan hak konsumen	A/B	2
43	FG Winarno	Pembaruan, 20 des 2002	Pangan transgenik, manfaat dan kontroversi	B	2
44	Untung Surapati	Pedoman rakyat, October 2002	Eco-narcotics	B	3
45	Untung Surapati	Bogor, 3 October 2002.	Tidak diperlukan tanaman transgenik di Sulawesi Selatan	B	3
46	Sudirman Nomba	Makasar, 22 March 2002	Status dan Perkembaagan kapas Transgenik di Sulasesi Selatan berdasarkan Kajian Tim Pemantau	B/C	1
47	Konphaindo	Paper, October 2002	What You should know about GMO	A/B/C	3
48	Winarso Drajad Widodo	Paper, 2002	GMO, Ancaman atau peluang ? Tinjauan aspek agronomi dan agroekososiologi	B/C/D	2
49	Sony Keraf	Bogor, 3 October 2002	Masalah etis tanaman trangenik	D	3
50	Dwi Andreas Santosa	Kompas, 23 August 2002	Biopolitik dan Tanaman Pangan Transgenik	C	3
51	Subiyakto & Nurindah	Bogor, 3 October 2002	Tinjauan multi aspek Penembangan kapas transgenik di Sulawesi Selatan	A/B/C	2

No	Author	Date & Source	Tittle	Category of topic	Category of scientist
2003					
52	Arief B. Witarto	Pembaruan, 31 Okt 2003	Mengembangkan Bioteknologi, kenapa mengucilkan diri ?	E/A	1
53	Arief Witarto, dkk	October 2003	Establishment of Indonesia Biosafety Clearing House	A	2
54	Arief Witarto, LIPI	Kompas, 14 April 2003	Bertani Protein	E	1
55	Bustanul Arifin	Pembaruan, 3 June 2003	Pertanian Transgenik, Ancaman atau harapan ?	E	2
56	K Bertens,	Pembaruan, 31 May 2003	Etika penelitian sel induk	B/E	2
57	Shobar Wiganda	Pembaruan, 13 May 2003	Tanaman transgenik, peluang sekaligus ancaman	B	2
2004					
58	Achmad Baihaki	Yogyakarta, 24 January 2004.	Penyusunan pedoman analisis resiko luingkungan pada produk hasil rekayasa genetik	A/B	2
59	Amy estiai, inez dkk	Yogyakarta, 24 January 2004.	Mechanism for harmonization of risk assesment, mutual aceptance of data and data vaidation	A	1
60	Effendi sumardja HI-KLH	Yogyakarta, January 2004	Protokol cartagena, mengenai keamanan hayati	A/B	2
61	George Monbiot	Jakarta post, 10 March 2004	GM crops will anable companies to monopolize food production	A/C	3
62	Hira J	Kompas, 19 February 2004	Kehati-hatian setengah hati	A/B/C/	3
63	Inez Slamet	Yogyakarta, 24 January 2004,	Pengaturan Keamanan hayati tanaman transgenik	A	2
64	Inez Slamet	Yogyakarta, 24 January 2004,	Status terkini dan peluang pengembangan produk rekayasa genetika	B	
65	K. Bertens	Pembaruan, 7 Feb 2004	Diskusi tentang pangan transgenik berlanjut terus	B/C/D	2
66	Konphal, Aman, Walhi, Jatam, JAringpela	February 2004, pers release	Selamatkan sumberdaya hayati, lindungi rakyat dari kekerasan	A/B/C	3
67	Kusumo Diwyanti	January 2004	Saran dan tanggapan rencana umum kebijakan & kegiatan Bioteknologi	C/D	

No	Author	Date & Source	Tittle	Category of topic	Category of scientist
68	Sri setiati harjadi	Kongres peragi VII, 2004	Keterkaitan GMC dengan pemecahan masalah	A/B/C	1
69	Sue mayer	Jakarta post, 8 May 2004	We should reject GM plants, even for use in nonfood crops	B	2

Topic of articles/news (including *Bt* cotton issue) in Indonesian newspaper
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C. Economic issues of Bt Cotton i.e. economic returns, economic dependency and potential losses
D. Moral and ethical issues
E. Could not classify

Position of Scholars are analyse according to the following criteria
1: Scientists have strong positive perceptions, views, beliefs and outlooks toward the use of GM product
2: Scientists valued GM product as having both either positive or negative side
3: Scientists are having negative perceptions, views, beliefs and outlooks toward the use of GM product. Precautionary principles should be undertaken.

Appendix 7. List of Seminar/Workshop related to GMO, 1999 - 2003

	Date & Place	Tittle of Seminar/Workshop	Organizer
1	Jakarta, 21 Juni 1999	Lokakarya bioteknologi dan pengembangan keanekaragaman hayati	Konphalindo
2	Jakarta, 23 November 2000	Seminar nasional penerapan teknologi transgenik di bidang pertanian	LP3NU
3	Trawas, 22 September 2001	Bahaya transgenik bagi keberlanjutan pertanian di Indonesia	Konphalindo
4	Yogyakarta, 8 Oktober 2001	Semiloka menyikapi dan menyiasati benih tanaman transgenik	STPN-HPS & Konphalindo
5	Bulukumba, 19-20 Maret 2002	Lokakarya : Memperkuat jaringan untuk mewujudkan praturan kamanan hayati dan mengembangkan pertanian organik sebagai alternatif yang memerdekakan petani	Yayasan Pendidikan Rakyat & Konphalindo
6	Makasar, 22 Maret 2002	Setahun Kapas Transgenik : Siapa yang untung	Yayasan Asa Nusantara
7	Bandung, 27 Agustus 2002	Seminar sehari: tanaman transgenik dan masa depan pertanian organik	Jaker PO & Konphalindo
8	Jakarta, 28 Nopember 2002	Diskusi publik : Perlunya aturan keamanan hayati dan pangan produk hasil rekayasa genetka	Koalisi Ornop untuk Keamanan Hayati dan Pangan
9	Bogor, 22 Oktober 2002	Roundtable discussion: Tinjauan multi aspek pengembangan, manfaat dan implikasi pelepasan tanaman transgenik di Indonesia	PKPHT IPB
10	Yogyakarta, 24 Januari 2003	Lokakarya Keamanan Hayati	