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## **Indonesia**

### **Biotechnology - GE Plants and Animals**

#### **Biotechnology Annual 2010**

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**Report Highlights:**

Recently the Government of Indonesia (GOI) established a Biosafety Committee for Transgenic Products. With this new Committee, it is expected that the commercialization of transgenic products in Indonesian will advanced more expeditiously.

**Section I. Executive Summary:**

In order to bring Indonesia into compliance under the Cartagena Protocol on Biosafety, the government has issued several regulations on biotechnology (BT), albeit at a slow pace. Government Regulation No. 21 concerning Biosafety of Transgenic Products was released in 2005. Also, the National Agency of Drug and Food Control (BPOM) published the Guidelines for Food Safety Assessment on Transgenic Products in 2008. More recently, Presidential Regulation No. 39/2010 was issued, which establishes the Biosafety Committee for Transgenic Products, a necessary mechanism to complete outstanding and new biotechnology regulations. In addition, clear labeling regulations for packaged, retail food products

containing transgenic ingredients is expected will be released in the near future.

FAS sources have reported that two transgenic crops and one feed enrichment product are currently in the pipeline for commercialization.

## **Section II. Plant Biotechnology Trade and Production:**

Indonesia has not produced any crops that involve transgenic processes, but it does produce and commercialize seedlings using tissue culture techniques. Among these are:

- tree seedlings (eucalyptus, acacia, mangrove) designed for domestic reforestation
- certain flower species for export, primarily to the European Union
- teak (*tectona grandis*),
- banana (*musa sp*) cultivars of cavendish, raja bulu, kepok and barangan
- zodiac (*evodia suapeolens*)
- satoimo (*colocacia esculenta var. antiquorum*)
- black velvet (*alocasia reginula*)
- silver velvet (*alocasia sp.*)
- philodendron lynette
- dragon scale
- cuprea sp.
- pineapple (*ananas comusus*)
- potatoe (*solanum tuberosum L.*)
- orchid
- asparagus sp.
- nilam (*pacholi cublin*)
- strawberry (*duchesnea indica L.*)
- pulai pandak (*rauvolfia radix*).

Indonesia will likely have the capacity to multiply transgenic seeds or commercialize transgenic crops in the coming year.

Currently the GOI has carried out confined field-testing to several transgenic crops including rice (resistant to biotic stress), sugar cane (tolerant to a-biotic stress and modification of high glucose content), cassava (modification of amylase), potato (resistant to biotic stress), and tomato (resistant to biotic stress). Transgenic rice already field tested in 22 locations throughout Indonesia, yet it requires further testing in another 16 locations before receiving approval from The National Seed Agency for licensing.

Additional GOI research projects on transgenic plants such as virus resistance for tomatoes and potatoes, delayed ripening for papaya, sweet potato pest resistance, drought tolerant rice, and pest resistant soybeans, remain ongoing, albeit at a relatively modest pace.

BT corn, BT cotton, RR corn, and RR soybeans seeds have passed the biosafety assessment process. In addition, Ronozyme-P and Finase L and P (as protein enrichment for feed) are reported to be in the pipeline. The tables show the crop types/events and its approval status.

Table 1. Transgenic crops types that have approval for biosafety

Plant	Trait	Gen	Source	Gen Transfer Technique	Event
Cotton	Insect resistant	Cry1Ac	Bacillus thuringensis subsp. kurstaki	Agrobacterium tumefaciens	MON531/757/1076
Cotton	Glyphosate herbicide tolerant	CP4 EPSPS	A. tumefaciens strain CP4	Agrobacterium tumefaciens	MON1445/1698
Soybean	Glyphosate herbicide tolerant	CP4 EPSPS	A. tumefaciens strain CP4	Particle gun method	GTS 40-3-2
Corn	Glyphosate herbicide tolerant	mEPSPS	Corn	Particle gun method	GA 21
Corn	Insect resistant	Cry1Ab	Bacillus thuringensis subsp kurstaki	Particle gun method	MON810

Indonesian Center for Agricultural Biotechnology and Genetic Resources Research Development, Ministry of Agriculture (2008)

Table 2. The status of environmental safety of the transgenic products

No	Transgenic Product	Bio-safety Committee Recommendation	Government Approval Status
1.	BT Cotton Variety Bt DP 90 B (identical 90 BE 60023) & PM 1560 B (identical 1560 BE 72022) Event MON 531/757/1076 (MON-ØØ531-6, MON- ØØ757-7)	Safe towards environment and biodiversity (1999)	Limited release based on the Decree of Minister of Agriculture Decree in 2001, 2002, and 2003
2.	Roundup Ready Cotton Variety DP 5690 RR (identical 1220 RRA 68022) & DP 90 RR (identical 90 RE 60012) Event MON 1445/1698 (MON-Ø1445-2)	Safe towards environment and biodiversity (1999)	Approval letter by the Chairman of National Bio-safety Committee
3.	Roundup Ready Soybean Variety Cristalina RR & Jatoba RR Event GTS 40-3-2 (MON- Ø4Ø32-6)	Safe towards environment and biodiversity (1999)	Approval letter by the Chairman of National Bio-safety Committee
4.	Roundup Ready Corn	Safe towards	Approval letter by the Chairman of

	Variety RR-1 & RR-2 Event GA 21 (MON- ØØ21-9)	environment and biodiversity (1999)	National Bio-safety Committee
5.	BT Corn Variety Bt MON 810-1 & Bt Mon 810-2 Event MON 810 (MON- ØØ810-6)	Safe towards environment and biodiversity (1999)	Approval letter by the Chairman of National Bio-safety Committee
6.	Ronozyme-P (probiotic feed)	Safe towards environment and biodiversity (2001)	-
7.	Finase-P and Finase-L (probiotic feed)	Safe towards environment and biodiversity (2001)	Bio-safety Recommendation from the Director General of Agriculture Research and Development Agency, Ministry of Agriculture

Source: Indonesia Bio-safety Clearing House (2009)

It is reported that some new transgenic crops have been assessed for their biosafety and food safety. The tables below show the status of these transgenic crops.

Table 3. The status of food safety assessment of transgenic crops

Transgenic Crops	Trait	Event	Meeting of Technical Team for Bio-safety and Food safety			Committee of Bio-safety and Food safety	
			Small team	Group of Food	Pleno	BCH	Secretariat
Corn	Herbicide tolerant	NK603	+	+	+	+*	+**
Corn	Insect resistant	MON89034	+	+	+	+*	+**
Corn	Herbicide tolerant	GA21	+	+	#	#	#
Corn	Insect resistant	BT11	+	+	#	#	#
Corn	Insect resistant	MIR 162	+	#	#	#	#
Corn	Insect resistant	MIR 604	+	#	#	#	#
Soybean	Herbicide tolerant	GTS40-3-2	+	#	#	#	#
Soybean	Herbicide tolerant	MON89788	+	#	#	#	#
Sugar cane	Drought tolerant	N11-1T, N11-2T N11-3T	+	#	#	#	#

		N11-4T N11-5T, and N11-6T					
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Source: Dr. M. Herman, Indonesian Center for Agricultural Biotechnology and Genetic Resources Research Development, Ministry of Agriculture (2010)

Note:

BCH : Biosafety Clearing House

+ : Has been done

# : Has not been done

\* : Public notification for 60 days has been done

\*\* : Public participation has been submitted to the secretariat of the committee of bio-safety and food safety

The status of bio-safety assessment of transgenic crops in Bio-safety containment test (BCF) and Confined field trial (CFT)

Transgenic crops	Trait	BCF		CFT
		Green house	Screen house	
Rice	Stem borer resistant	2001 - 2002	-	2002 - 2005
Sugar cane	Drought tolerant	2005 - 2007	-	2005 - 2007
Sugar cane	High glucose content	2008	-	2008 - 2010
Potato	Lateblight resistant	2007 - 2008	-	2007 - 2009
Tomato	Viruses resistance ( tomato yellow leaf curl virus and cucumber mosaic virus)	2007 - 2008	-	2009
Tomato	Partenokapi	2006 - 2007	-	-
Cassava	Free amylase	2005	2006 – 2008	2007 – 2010
Papaya	Delayed ripening	2005	2006 – 2010	-
Rice	Nitrogen use efficiency	2007 - 2010	-	-

Source: Dr. M. Herman, Indonesian Center for Agricultural Biotechnology and Genetic Resources Research Development, Ministry of Agriculture (2010)

The previous Biosafety Committee for Transgenic Products declared that corn NK603 and corn MON89034 are safe for food consumption. However, with the establishment of the new Biosafety Committee for Transgenic Products, currently it is waiting for this new committee to present the food

safety certificate of these two transgenic products to the Head of BPOM for issuing the decree of releasing or distribution the products. Therefore, it is expected next month these two transgenic products will be fully commercialized.

At present Indonesia is not a receipt of USDA-funded food aid.

**Section III. Plant Biotechnology Policy:**

The GOI’s policy on biotechnology is “accept with a precautionary approach” with respect to environment safety, food safety, and/or feed safety based on scientific approaches as well as taking into considerations of religion, ethical, socio-cultural, and esthetical norms. Therefore, several regulations and guidelines have been issued to protect the public from the possibility of negative consequences of biotechnology utilization.

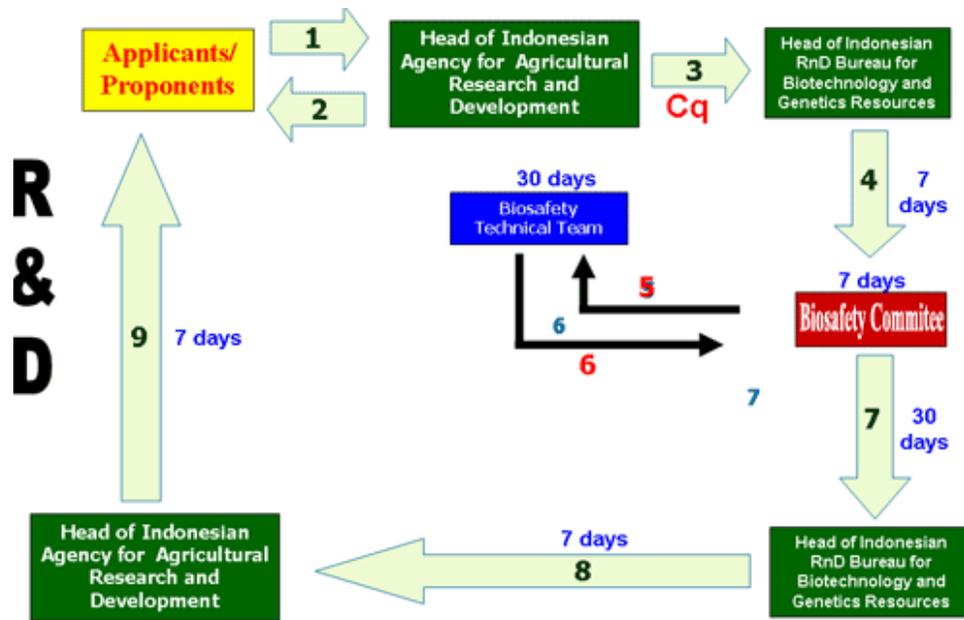
The Ministers of Environment, Agriculture, Forestry, Marine Affairs and Fisheries, and the Head of National Agency of Drug and Food Control are the authorities that have responsible for approving and releasing the transgenic products. The table 5 shows each ministry roles as the national competent authority.

Table 5. The National Competent Authority for Biosafety and Food Safety of Transgenic Products

No.	National Competent Authorities		Responsible for
	Ministry	Office	
1.	Ministry of Environment	Deputy for Biodiversity Conservation Enhancement and Environmental Destruction Control	Bio-safety
2.	Ministry of Agriculture		Feed safety and fresh food safety
3.	Ministry of Agriculture	Center for Investment and License	Seed imports permit
4.	Ministry of Agriculture	Indonesian Agency for Agriculture Research and Development	Research permit
5.	Ministry of Agriculture	Indonesian Agency for Agriculture Quarantine	Plant and animal imports
6.	National Agency of Drug and Food Control		Processed food safety
7.	Ministry of Marine Affairs and Fisheries	Research Center for Marine and Fisheries Product Processing and Biotechnology	Fisheries products and fish feed
8.	Ministry of Forestry		Forestry plants

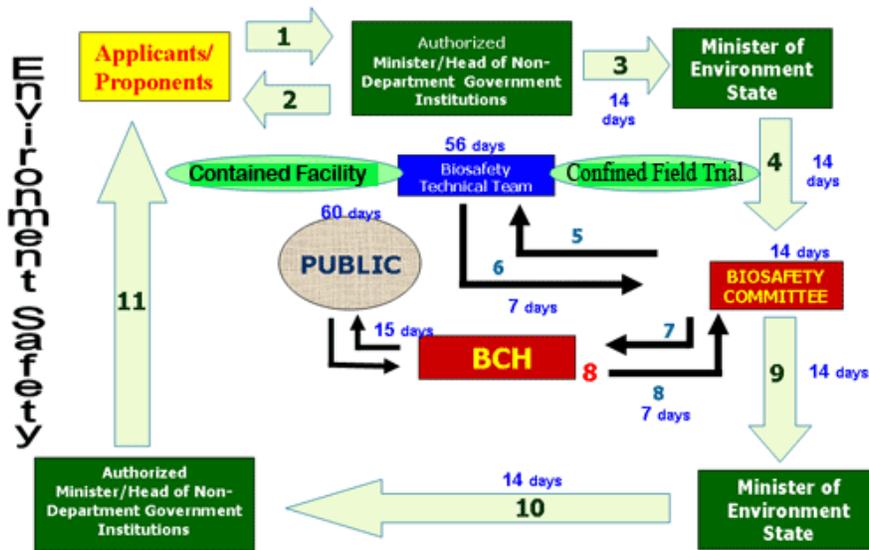
Source: Indonesia Bio-safety Clearing House (2010)

According to the Government Regulation No. 21 in 2005, the procedures for approval of food, feed, processing and environmental releases are showed in the following figures.



Source: Indonesia Bio-safety Clearing House (2010)

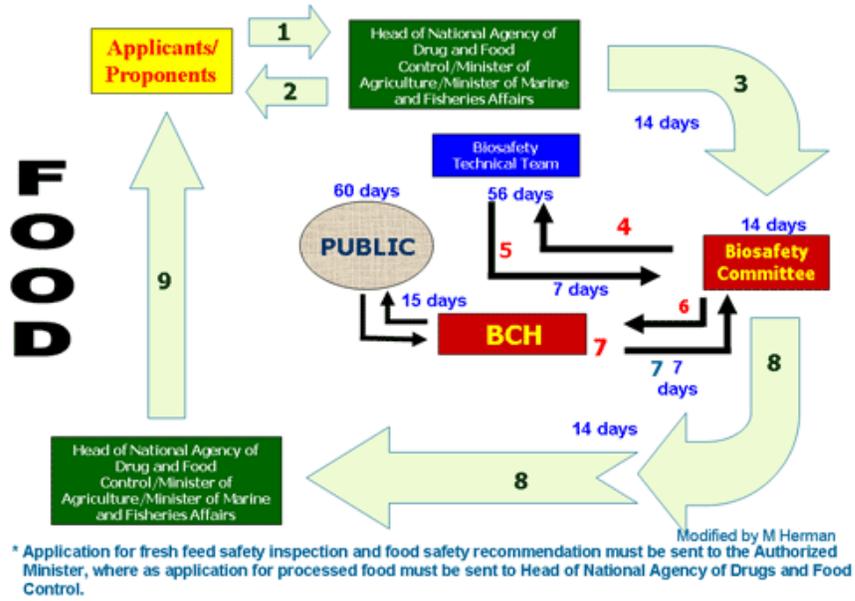
Figure 1. Procedure for Research and Development based on Government Regulation No. 21/2005



\* For the introduction of the first seed, the applicant/proponent must apply for permission to the Head of Indonesian Agency for Agricultural Research and Development through licensing and Investment Center

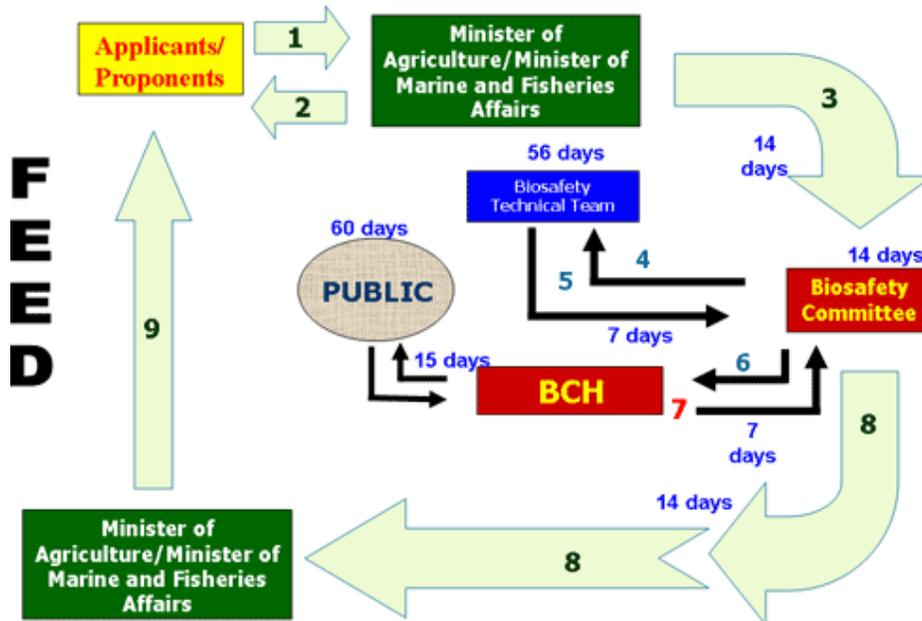
Source: Indonesia Bio-safety Clearing House (2010)

Figure 2. Procedure for Environment Safety based on Government Regulation No. 21/2005



Source: Indonesia Bio-safety Clearing House (2010)

Figure 3. Procedure for Food Safety based on Government Regulation No. 21/2005



Source: Indonesia Bio-safety Clearing House (2010)

Figure 4. Procedure for Feed Safety based on Government Regulation No. 21/2005

Five years after issuing the regulation on Biosafety of Transgenic Product in 2005, the President signed the Presidential Regulation on establishing the Biosafety Committee for Transgenic Products to implement the regulation. The old committee that had been in place since 1999 has been dismissed. The new committee consists of 21 members from a variety of stakeholders, including government ministries, universities, and professional associations. GAIN Report ID1017 regarding the Presidential Regulation No. 39/2010 on The Committee of Bio-Safety on Transgenic Products explains this in more detail.

Most of the members of the Biosafety Committee for Transgenic Products are high level government officials, although they are not necessarily experts in those fields. The Technical Team for Biosafety, who assists the Committee to conduct the technical assessments, has technical expertise in environmental safety and food safety fields. The Committee has assigned the previous Technical Team for Biosafety to continue carrying out their duties on document assessment of bio-safety testing until the new Technical Team for Biosafety is established.

To implement the government regulation on Biosafety of Transgenic Product in 2005 and in conjunction with the government regulation on food safety, quality, and nutrition in 2004 BPOM finally released its new regulation concerning the guidelines for food safety assessment for transgenic products in July 2008. However, the government does not seem to consider this a priority as the regulation has yet to be publicly announced. In addition, the guidelines don't cover the threshold level of GMO content in the product. The guidelines are needed to bring Indonesia into compliance with the Cartagena Protocol on biosafety.

For labeling requirements, reportedly BPOM - together with the Biosafety Committee - is revising the labeling regulations for packaged retail foods that contain transgenic products. It is expected that BPOM will publish the labeling regulation before the end of 2010.

In 2004 Indonesia ratified the Cartagena Protocol with Government Regulation No. 21/2004 concerning Bio-safety to the Convention on Biological Diversity.

At present, there are no imported or locally developed commercial transgenic seed varieties approved for planting in Indonesia. Nevertheless, research activity at a relatively low level (for example: second replication of containment trials) continues. Also continuing is GOI research and development at the agricultural institutes in Bogor. In addition, it is reported one variety of corn transgenic was started to plant for limited field trial in Bogor.

A government regulation issued in 1999 requires labels and special logos to be on packaging of food containing transgenic ingredients, although this has yet to be enforced. Reportedly the government will only require labeling of food products containing more than 5 percent content derived from transgenic processes. Local development, multiplication and use of transgenic seed continue to be hampered by the current regulatory system. This, plus additional confusion in the IPR sector, are major impediments to increased investment in Indonesian biotechnology activities.

Given the current situation, forecasting likely outcomes for the Indonesian biotech sector is problematic. It exposed on the variety workshops and seminars that biotechnology can play its role in supporting

food security in Indonesia, yet the GOI has lack of commitment to develop the technology, since it seems to become political issue. The immediate risk with respect to U.S. agricultural trade interests is that GOI regulatory functions could intrude negatively on trade. Certain sections of the GOI are actively pursuing non-tariff barriers to trade to protect Indonesian agriculture producers. Should this approach be applied more generally throughout the GOI, transgenic products are potential targets.

#### **Section IV. Plant Biotechnology Marketing Issues:**

In 2006 there was a survey to determine public acceptance of transgenic products. The survey targeted students at a well-known agriculture university in Indonesia. The research showed that the students lack knowledge of transgenic foods, even if they had a class in biology. The study also found that students: (1) are somewhat willing to consume transgenic foods if transgenic products reduce the amount of pesticides applied to crops, (2) are very willing to consume transgenic foods if the foods were more nutritious than non-transgenic foods, (3) will avoid consuming transgenic foods if the foods posed a risk of causing allergic reactions for some people, (4) consider ethical and religious concerns as very important to purchasing decisions, (5) had mixed reactions on the importance of price when making the decision to purchase transgenic foods, (6) feel labeling of transgenic foods should be mandatory even though it will affect the price, and (7) think the government regulation on food safety remains poor.

#### **Section V. Plant Biotechnology Capacity Building and Outreach:**

In coordination with the Ministry of Agriculture, FAS Jakarta hosted a one-day workshop entitled: “Indonesia – U.S. Partnership: Agricultural Innovation and Investment to Enhance Food Security” in March 2010. The workshop emphasized potential areas of enhanced collaboration, which led to the workshop recommendations from participants to focus on corn, cocoa, coffee, horticulture, and aquaculture commodities. Collaboration is to include enhanced technology (research), post-harvest investment with a focus on trade capacity building (regulatory reform based on science, production systems, value-added processing, supply-chain distribution, and farm-to-market infrastructure). Collaborating partners are to include the bilateral government agencies, private sector agribusiness companies, and agricultural (Land Grant) university linkages. On the workshop, much of the discussion on enhanced technology focused on biotechnology – especially for corn. One of the main recommendations from the participants was to bring an Indonesian delegation to the Philippines on a biotechnology study tour. FAS Jakarta – through funding from USDA/FAS/– organized the trip in coordination with CropLife Asia and the Biotechnology Coalition of the Philippines. The Indonesian delegation represented the Ministry of Agriculture, university and government researchers, agricultural officers from the major corn production provinces of Lampung and East Java, and CropLife Asia. The delegation has learned some lessons, such as: the implementation of regulations and policies in the development of commercialization in Philippines, research and development of technology that supports public – private partnership, government policy and implementation of biotechnology product development, and efforts for acceleration of biotechnology implementation in Indonesia. Following the success of the Indonesian delegation trip to the Philippines, the Minister of Agriculture has stated his desire to also visit the biotech crop field in the Philippines in 2010.

FAS Jakarta has actively recruited Cochran Fellows and participants for other USDA-sponsored events since 1998. Following is a list of the activities from FAS Jakarta for capacity building on biotechnology over the past two years with detailing participants from Indonesia.

#### **Cochran Fellowships from Indonesia Related to Biotechnology**

None

### **Biotechnology “Capacity Building” Events Sponsored by USDA**

- LIABILITY REDRESS ISSUES RELATED TO THE CARTEGENA PROTOCOL ON BIOSAFETY – TOKYO, JAPAN  
February 13 – 14, 2008  
2 Indonesian attendees
- 7<sup>TH</sup> APEC HIGH LEVEL POLICY DIALOGUE – LIMA, PERU  
February 26 – 28, 2008  
2 Indonesian attendees
- ROUND TABLE DISSCUSSION ON LOW LEVEL PRESENCE - SINGAPORE  
February 17 – 18, 2009  
1 Indonesian attendee
- 8<sup>TH</sup> APEC HIGH LEVEL POLICY DIALOGUE - SINGAPORE  
February 19 – 21, 2009  
1 Indonesian attendee
- BIOTECH LABELLING OUTREACH WORKSHOP – SINGAPORE  
February 22 – 23, 2009  
3 Indonesian attendees
- 9<sup>TH</sup> APEC HIGH LEVEL POLICY DIALOGUE – SAPPORO, JAPAN  
May 29 – 30, 2010  
3 attendees
- ROUND TABLE DISSCUSSION ON LOW LEVEL PRESENCE – SAPPORO, JAPAN  
May 27 – 28, 2010  
3 attendees

### **Biotechnology Capacity Building Events Sponsored by FAS Jakarta (through TIRF funding)**

Study Visit of High level GOI officials on Biotech Crops in the Philippines, July 5 – 9, 2010.

### **Biotechnology Capacity Building Events Sponsored by U.S. Government**

Food Security Workshop: Agricultural Innovation and Investment to Enhance Food Security, March 2, 2010 (funded under Biotech Outreach Fund, Bureau of Economic, Energy, and Business Affairs (EEB), U.S. Department of State)

Indonesia has significant capacity to promulgate but limited capability to enforce regulations with respect to food safety and biosafety of transgenic-origin products. Reportedly, Indonesia has specific needs in raising the capacity of this country to apply transparent and science-based regulations to plant

biotechnology, such as: knowledge improvement of technical team through biosafety training on future transgenic products, improvement of biosafety facilities (environment, food, and feed safety), revision of the guideline for environment safety assessment, finalization the guideline for feed safety assessment, finalization the guideline for research and development of transgenic products in the laboratory, biosafety containment, and confined field, as well as developing a guideline for monitoring and risk management.

#### **Section VI. Animal Biotechnology:**

Although the regulations regarding transgenic animals are in place, Indonesia does not currently produce or commercialize transgenic animals. The general consensus is that the application of transgenic animals in Indonesia is still a long ways off. However, some research institutions and universities have conducted studies on molecular marker, such as: research on genetic cow and bull using gen markers, identification of animal characteristics to heat tolerance and feeding utilization, and transgenic chicken (resistance to New Castle disease) using simple breeding method.

Reportedly, two local companies have requested an approval to the Commission of Bio-safety for transgenic products for importing avian influenza vaccines that were produced using biotechnology, yet they have difficulties to seek the testing laboratory for supporting data to the Commission.

#### **Section VII. Author Defined:**

Useful websites:

- Indonesia Biosafety Clearing-House: <http://indonesiabch.org>
- Indonesian Center for Agricultural Biotechnology and Genetic Resources Research and Development (ICABIOGRAD), Ministry of Agriculture: <http://biogen.litbang.deptan.go.id/cms/>
- Clearing House Mechanism of National Biodiversity: <http://bk.menlh.go.id/?&lang=en>
- Indonesian Biotechnology Information Center (IndoBIC): <http://www.indobic.or.id/>