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Philippine Biotechnology Situation and Outlook

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Report Highlights:

The home of Golden Rice and the newly developed Bt eggplant, the Philippines has long been a leader in biotech research and commercialization. GE corn has been on sale in the country since 2003 and comprised 28% of planted area in 2012. This leadership status has attracted attacks from domestic and international anti-biotech groups, culminating in a 2012 law suit to halt commercialization of Bt eggplant and other crops. While the widely criticized ruling did not block commercialization of Bt eggplant, its order to discontinue the already completed field trials caused regulators to postpone final approval. Nevertheless, the country continues to be a model for GE regulatory policy for other developing countries. Science-based and thorough, Philippine regulations have allowed the propagation of GE corn for over a decade with no environmental and health issues. Largely as a result, the Philippine government predicts corn self-sufficiency will be achieved in 2013. The Philippine openness to biotechnology has also allowed the entry of U.S. GE or GE-derived food and agricultural exports to the Philippines, valued at over \$1.5 billion in 2012.

Section I. Executive Summary:

In 2012, the Philippines was the 9th largest market for U.S. agricultural products, most of which were GE or GE-derived. U.S. exports of GE and GE products to the Philippines reached over \$1.5 billion in 2012, inclusive of meat, dairy, and processed foods that contain high fructose corn syrup and/or vegetable oils.

The 729,000 hectares planted to GE corn in 2012 comprised 28% of total corn area, and made the Philippines the 12th largest country in area planted to GE crops. There are 5 transformation events (TEs) in 8 GE corn varieties that are approved for commercial production in the Philippines. While as of July 2013 corn was the only product approved for commercialization, Golden Rice and Bt eggplant had completed most required testing and administrative requirements.

Philippine regulations governing biotechnology crop regulations are widely recognized as science-based, thorough, and transparent. To ensure human, food, feed, and environmental safety, the regulatory regime requires that risk assessments be conducted in accordance with internationally accepted bodies such as the Cartagena Protocol on Biosafety, Codex Alimentarius Commission, Organisation for Economic Co-operation and Development, and the Food and Agriculture Organization. The current regulations do not cover GE or cloned animals.

The Philippines' prominence in biotechnology, and particularly the consumer benefits that would flow from the commercialization of Golden Rice and Bt eggplant, has made it a target for domestic and international anti-biotech groups. This opposition in early 2012 culminated in a lawsuit challenging the safety of Bt eggplant. The resulting court decision which ordered a halt to field tests has been widely criticized by prominent Philippine scientists, farmers and student groups. Although many analysts have labeled the ruling 'toothless' because the field trials had already been completed, and because the court did not criticize the existing regulations or block commercialization, the decision appears to have slowed the final approval process. It has also encouraged anti-biotech groups to file additional suits, and has revealed a significant level of suspicion and uncertainty about GE technology among the educated public.

Section II. Plant Biotechnology Trade and Production:

In its Corn Industry Roadmap for the period 2011-2017, the Philippine Department of Agriculture aims to attain self-sufficiency by 2013. Industry officials and farmers attribute the significant improvement in local corn production to the use of superior GE corn seeds, and say GE seeds will be essential to achieving self-sufficiency.

a) PRODUCT DEVELOPMENT:

Development of the fruit and shoot borer-resistant eggplant (Bt eggplant) was led by the Institute of Plant Breeding of the University of the Philippines at Los Banos (IPB-UPLB). Even though the widely criticized ruling by a Philippine court has delayed final approvals, the Bt eggplant remains poised to be the first locally developed GE crop to be commercialized. According to the Philippine Department of Agriculture (DA), the Bt technology was donated by the Maharashtra Hybrid Seed Company to UPLB

through a royalty-free sublicense agreement. The Bt eggplant is expected to address 54%-70% yield loss brought about by the fruit and shoot borer, as well reduce insecticide spraying by up to 70-80 times per season. Analysts report insecticide application (often done on small farms by children) accounts for 30% of total production cost.

For Vitamin A-enriched and virus-resistant rice (Golden Rice (GR) project), wet season field tests are currently ongoing in several sites. The GR project is being developed by the Philippine Rice Research Institute, and is supported by Helen Keller International, the Bangladesh International Rice Research Institute, International Rice Research Institute, Bill and Melinda Gates Foundation, Rockefeller Foundation, USAID, and the Philippine DA. Submission of the full application for its possible commercial planting is expected after conclusion of the wet season trials. After the conclusion of biosafety tests, nutritional studies will be pursued. According to the DA, initial tests show that the GR breeding line can provide higher levels of betacarotene (around 50% of the recommended daily allowance of Vitamin A per 150 grams of uncooked rice). Only after the nutritional evaluations are satisfied will approval for commercial propagation proceed. The DA predicts GR commercialization will help alleviate Vitamin A-deficiency in the country, and address 50% and 20% yield losses from tungro and bacterial blight problems, respectively.

Similarly, Bt cotton (where the Bt gene developed in China that fights bollworm in cotton is inserted in Indian varieties whose seeds are being tested for efficacy under local conditions) finished confined field tests in the second half of 2011. These tests confirmed the efficacy of Bt cotton against the bollworm. Current field trials ongoing in 5 sites are being undertaken. The DA reports that Bt cotton yields 20% more than conventional varieties, and reduces the number of chemical insecticide applications from the current 10-12 to 1-2 times per season. Bt cotton is being developed by the Philippine government's Cotton Development Administration.

The IPB-UPLB's project to fight ring spot virus (RSV) on Philippine papaya is moving forward on field tests and insect resistance studies. The IPB estimates the GE papaya will address the 60-100% yield losses due to the papaya ring spot virus. In addition, the IPB estimates the RSV-resistant/delayed ripening variety will extend the shelf life by up to 12 days and reduce post-harvest losses of up to 40%.

b) COMMERCIAL PRODUCTION:

There are 5 transformation events (TEs) in 8 GE corn varieties currently approved for commercial production in the Philippines. Approvals for commercial production of GE crops are valid for 5 years, renewable for another 5 years. While all approved GE crops for propagation are certified for both feed and food use, commercially available, GE corn is primarily grown for animal feed consumption. More information is provided under Section III on Plant Biotechnology Policy.

GE stacked-trait corn dominated biotech corn propagation in 2012 accounting for 84% of all GE corn; followed by pyramided GE corn (11%); Bt corn (2.98%); and Roundup Ready corn (2.88%). Since its introduction in 2003, GE corn has been planted on close to 3.2 million hectares in the Philippines. In 2012, GE corn accounted for over 28% (729,000 hectares) of all Philippine corn areas (2.6 million hectares).

GE Corn Adoption by Event (Hectares)					
CY 2003 - 2012					
Year	Bt	RR	Stacked	Pyramided	Total
2003	10,769	-	-	-	10,769
2004	59,756	-	-	-	59,756
2005	50,009	-	-	-	50,009
2006	96,800	26,493	4,580	-	127,873
2007	122,613	120,023	71,279	-	313,915
2008	81,752	51,485	214,503	-	347,740
2009	48,038	46,809	232,475	-	327,322
2010	40,235	8,690	493,598	-	542,523
2011	21,205	15,038	643,665	5,464	685,372
2012*	21,693	20,947	612,102	74,704	729,446
Total	552,870	289,485	2,272,202	80,168	3,194,725

*Preliminary

Source: Bureau of Plant Industry

c) EXPORTS:

The local industry in late 2012 petitioned the GPH to allow it to export corn but was denied, as the local feedgrain supply was short of feed demand. Corn exports are only allowed if the GPH declares a surplus. However, exports of corn silage to South Korea took place in early 2013 and more silage exports are being finalized to Japan.

d) IMPORTS:

Philippine imports of GE crops and by-products continued to expand in 2012 making an important contribution to the country's national food supply and food security. U.S. exports of these products to the Philippines grew 43% to over \$755 million from the \$527 million-level in 2011. By broadening the category to GE-derived products (e.g., meat, dairy, and processed foods that contain high fructose corn syrup and/or vegetable oils), U.S. sales exceeded \$1.5 billion in 2012. Following is a breakdown of U.S. exports of GE crops and products to the Philippines through 2012.

CY US Exports to the Philippines (In Thousand \$)			
	2010	2011	2012
Soybean Meal	325,917	315,401	598,733
Feeds & Fodders	72,286	91,802	83,701
Soybeans	30,261	35,571	24,654
Sweeteners	41,950	55,685	30,226
Coarse Grains	842	818	3,489
Cotton	13,922	19,943	8,612
Vegetable Oil*	5,971	6,644	4,995
Soybean Oil	650	1,277	828
TOTALS	491,799	527,141	755,238

* excluding Soybean oil group

Source: U.S. Bureau of Census Trade Data

e) **FOOD AID RECIPIENT COUNTRIES:**

The Philippines is a consistent food aid recipient (Food for Progress) and there have been no issues related to biotechnology that impede the importation of food aid commodities.

Section III. Plant Biotechnology Policy:

a) **REGULATORY FRAMEWORK:**

Philippine biotechnology regulations are well respected for their thoroughness, and are looked upon as a model by other developing countries. The biotechnology regulatory regime is embodied in the Department of Agriculture's Administrative Order No. 8 (DA-AO8) issued in April 2002. To ensure human, food, feed, and environmental safety, DA-AO8 requires science-based risk assessments be conducted in accordance with internationally accepted bodies such as the Cartagena Protocol on Biosafety, Codex Alimentarius Commission, Organisation for Economic Co-operation and Development, Food and Agriculture Organization.

DA-AO8 derives legal basis from the Philippine Plant Quarantine Law of 1978, the Agricultural and Fisheries Modernization Act of 1997, existing mandates of the Bureau of Animal Industry and Fertilizer and Pesticide Authority, and Executive Order No. 340 of 1990 which creates the National Committee on Biosafety of the Philippines (NCBP).

The Bureau of Animal Industry (BAI) evaluates feed safety while the Bureau of Agricultural and Fishery Products Standards handles food safety concerns. Quarantine and environmental issues fall under the responsibility of the Bureau of Plant Industry (BPI) while the Fertilizer and Pesticide Authority handles applications of pest protected plants. A unique feature of Philippine regulations is the conduct of a parallel review by the Scientific and Technical Review Panel (STRP), an independent body of experts from academia and the local scientific community.

Following are the 4 types of permits that DA-AO8 issues:

1. Application to Field Test (Annex I)
2. Application to Release for Propagation (Annex II)
3. Application for Importation for Direct Use (Annex III)
4. Petition for Delisting (Annex IV)

The application/approval process for each permit is provided at the end of this report (Annex I-IV).

Permits to import for contained use fall under the purview of the NCBP. The NCBP is composed of several agencies including the DA (as a member), and is chaired by the Secretary of the Department of Science and Technology (DOST). More on the NCBP is provided in the Section on the Cartagena Protocol on Biodiversity (CPB).

The DA-Office of the Undersecretary for Policy & Planning is responsible crafting, implementing, and oversight of the overall regulatory regime and biotech policy, in consultation with the NCBP. Draft policies are referred to the DA Secretary for approval. The DA also coordinates biotech regulatory activities and interacts with a scientific multidisciplinary group – the Biotechnology Advisory Team, comprised of respected scientists.

BPI is the lead agency in regulating GE crops, drawing scientific support and advice from the NCBP, the other concerned agencies, and the STRP.

b) APPROVALS:

The links to the relevant approval registries are provided below:

Name	Subject	Dated
ANNEX I	Approval registry for the importation of regulated articles for direct use as food and feed or for processing	02/11/13
ANNEX IA	Approval registry for the importation of combined trait products for direct use as food, feed and for processing	02/11/13
ANNEX II	Approval registry of regulated articles for propagation	02/11/13
ANNEX IIA	Approval registry for propagation of combined trait products	02/11/13
ANNEX III	List of Regulated Articles for Importation for Direct Use Requiring a Declaration of GEO Content	12/15/11
ANNEX IV	Approval Registry of Regulated Articles for Field Trial	02/11/13
ANNEX V	Registry of unrenewed regulated articles	10/24/12

Source: Bureau of Plant Industry

c) FIELD TESTING:

Refer to Annex IV in APPROVALS Table.

d) STACKED EVENT APPROVALS:

Refer to Annex IA and Annex IIA in APPROVALS Table.

e) ADDITIONAL REQUIREMENTS:

If the TE has been assessed and approved by the BPI, seed registration is still required with the National Seed Industry Council under the BPI.

f) COEXISTENCE:

There is currently no Philippine policy on coexistence with non-GE crops, and there are no rules in place or proposed on coexistence.

g) LABELING:

Currently, there are no labeling requirements for GE food products. Draft labeling guidelines for prepackaged foods derived from or containing GE ingredients have been posted on the Philippine Food and Drug Administration (FDA) website for public comment. The guidelines do not require any special labels for processed food products that are substantially equivalent or as safe as their conventional counterparts. The draft guidelines consider Codex Alimentarius standards on labeling as mentioned in the Compilation of Codex Texts Relevant to Labeling of Derived from Modern Biotechnology. The draft regulations may be viewed at:

<http://www.fda.gov.ph/attachments/article/80234/DRAFT->

In a February 2004 study commissioned by the FDA (then called the Bureau of Food and Drugs), it was found out a mandatory GE labeling system would raise food manufacturing costs by 11% to 12%. There has been advocacy by some groups for more rigorous mandatory labeling laws.

For imported bulk commodities, Philippine regulations require shipments to be accompanied by a “Declaration of GMO Content” signed by either one of the following: the responsible officer from the originating country, an accredited laboratory, the shipper, and/or the importer. DA maintains that the declaration is a part of its food and environment safety regulations, and that it brings the Philippines into compliance with Article 18.2 of the Cartagena Protocol on Biosafety (i.e., Handling, Transport, Packaging and Identification Requirements for Living Modified Organisms for Contained Use and Environmental Release). Since its implementation, Post is not aware of any trade-related disruption as a result of this requirement. A sample form of this declaration follows:

Declaration of GMO Content

The shipment may contain a GM ingredient:
 Yes _____ No _____

If yes, list the probable transformation events.

Present	<i>To be filled up by the PQS Officer</i>	
	In the Approval Registry	Not in the Approval Registry
_____	_____	_____
_____	_____	_____
_____	_____	_____

[Signature]
 Plant Quarantine Officer

[Signature]
 Responsible Officer from the Country of Origin/Accredited Laboratory/Importer/Shipper

Source: Philippine Department of Agriculture

On the issue of halal certification of GE food products, standards have been liberalized. Foods derived from GE products are now eligible for halal certification, according to the amended Philippine National Standard or PNS 2067/2008 Amd 01:2011. Previously, the PNS for Halal Food did not allow halal certification of GE foods.

Currently, only the National Commission for Muslim Filipinos is authorized to accredit Halal certification providers. As of April 2013, there has been no Halal certification provider accredited in the Philippines.

h) TRADE BARRIERS:

There are no known biotechnology-related trade barriers to U.S. exports. The DA readily accepts applications for all events approved by U.S. regulatory agencies.

i) INTELLECTUAL PROPERTY RIGHTS (IPR):

There are no plant patents in the Philippines. The country achieved compliance with its obligations under the WTO-TRIPS agreement on June 2007 with the passage of Republic Act 9168, otherwise known as the Plant Variety Protection Act of 2002 (PVPA).

Under the PVPA, holders of PVP certificates have the right to authorize production or reproduction, conditions for the purpose of propagation, offer for sale, sell or market, and export or import the varieties that they have developed. These rights also extend to harvested material resulting from the unauthorized use of their protected varieties – except if the use is by small farmers. Their rights also cover derived varieties (or those varieties predominantly derived from the initial variety that is being protected). Provisional protection may be provided to breeders, entitling them to some remuneration from the time the application is published until the granting of the certificate of PVP. In cases of infringement, the holder of the PVP certificate may petition the regional trial court for relief. As with other intellectual property rights laws, the local courts are relied upon for enforcement.

Under the PVPA, farmers are accorded the traditional right to save, use, exchange, share or sell their farm produce of a protected variety, except when the sale is for the purpose of reproduction under a commercial marketing agreement. The exchange and sale of seeds among farmers is on the condition that these are reproduced and replanted on their own lands.

j) CARTAGENA PROTOCOL RATIFICATION:

The Philippine Senate on August 14, 2006, adopted Senate Resolution No. 92 or the “Resolution Concurring in the Ratification of the Cartagena Protocol on Biosafety (CPB) to the UN Convention on Biological Diversity.” The CPB ratification follows the March 2006 issuance of Executive Order No. 514 adopting the National Biosafety Framework, which was the interim implementing mechanism of the CPB.

The NCBP issues guidelines and standards on risk assessment, environmental impact assessment, socio-economic, ethical and cultural assessments. The NCBP oversees the implementation of the NBF as well as coordinate and harmonize efforts and activities of the various concerned agencies and departments.

k) INTERNATIONAL TREATIES/FORA:

The Philippines actively participates in international biotechnology events including Codex Alimentarius meetings. In early June 2013, the Philippines hosted a 3-day regional CCASIA Codex Regional SPS Workshop in Manila that had close to 30 international participants.

The Philippines adopts the position of both technology-developer and technology-user relative to liability and redress discussions of the CPB.

l) RELATED ISSUES:

Following is a link to the DA’s biotechnology webpage:

www.biotech.da.gov.ph

m) MONITORING AND TESTING:

Monitoring by the BPI of GE crop propagation is handled by the BPI’s Post Approval Monitoring

group. The permit to propagate GE crops carries a stipulated provision that require the technology developer to undertake insect resistance management practices (if the approved event is Bt), and/or weed resistance interventions if the event involved is glyphosate-tolerance.

On May 8, 2012, the DA issued Memorandum Circular No. 3 (MC No. 3) or the New Directive on Insect Resistance Management in Bt corn. Effective September 1, 2012, MC No. 3 implements the bag-in-a bag structured refuge strategy by requiring all technology developers and seed developers to package 20% non-Bt corn seeds inside the larger Bt corn seed bag. Testing of the refuge-seeds prior to commercial distribution is conducted by the BPI.

n) **LOW LEVEL PRESENCE POLICY:**

In early 2009, the Philippine DA approved Administrative Order No. 1 (AO No. 1) adopting Annex 3 to the Codex Plant Guideline (i.e., “Food Safety Assessment in Situations of Low-Level Presence of Recombinant-DNA Plant Material in Food”) for the conduct of food safety assessment in situations of low-level presence (LLP) of recombinant-DNA plant materials in food and feed. AO No. 1 likewise directs the DA policy and regulatory office to clarify issues and formulate guidelines to implement the LLP policy. To date, no implementing guidelines have been issued.

Section IV. Plant Biotechnology Marketing Issues:

a) **MARKET ACCEPTANCE:**

In a 2008 survey conducted by the Singapore-based Asian Food Information Center, it was found that Filipino consumers had a positive perception of biotechnology. It was revealed that:

- Compared to the other surveyed countries (China, India, Japan and South Korea), consumers in the Philippines appeared to be most knowledgeable about food biotechnology.
- A large majority of Philippine consumers indicated that they accept biotechnology as a way to increase the production of food staples and to supply sustainable food.
- 59% have favorable impressions of plant biotechnology.
- 73% believe that they would personally benefit from food biotechnology in the next five years, i.e. improved food quality and making food more affordable.

Local farmers generally are supportive of GE crops and other technologies that provide higher incomes. However, and as mentioned in previous reports, there are pockets of resistance. There are currently 4 provinces and 1-municipality that have existing ordinances that ban or restrict the cultivation or use of GE crops and products. However, reports indicate these bans are widely ignored by farmers in those areas. These farmers obtain GE corn seeds at a higher price from a ‘black market’ that has recently developed as a result of the GE seed prohibition.

b) **PUBLIC/PRIVATE OPINIONS:**

Environmental activist groups and several nongovernmental organizations are at the forefront of the anti-GE campaign in the Philippines. Though unconfirmed, they reportedly obtain funds from foreign sources. These groups are not against any specific GE plant or product, nor with the intended use or trait(s) of the GE crop, but are against the technology in general. Academics describe their resistance as “ideological” in nature. Over the past years, eminent scientists, university presidents, and current and former officials have criticized efforts to block biotech, particularly since the court ruling ordering a halt to field testing of Bt eggplant.

Some stakeholders attribute the progress toward commercialization of Bt eggplant and Golden Rice as the main reasons for the intensified propaganda efforts by anti-biotech groups. Bt eggplant was being field tested in several sites from 2010-2012 (the final stages before commercialization) when in April 2012, activist groups filed a legal petition to stop the trials. In May 2013, the Philippine Court of Appeals ordered proponents of Bt eggplant to stop the field trials citing possible risks to human health and the environment. While some consider the ruling 'toothless' as the field trials have concluded, it has slowed final approval and commercialization. The Philippine government has decided to appeal the ruling. The court decision has brought biotech into the limelight and while anti-biotech groups are intensifying their efforts, many stakeholders are optimistic that biotech progress will continue in the Philippines.

c) **MARKETING STUDIES:**

Not applicable.

Section V. Plant Biotechnology Capacity Building and Outreach:

a) **ACTIVITIES:**

Philippine teams have been sent to the U.S for short term crop biotechnology training/orientation under the Cochran Fellowship and Norman Borlaug Programs. These programs have been extremely helpful in building and strengthening science-based regulations, as well as sustaining the country's regional leadership role in biotechnology research and development. These activities are broadly cited for helping make the Philippines a biotech leader.

In April 2012, USDA's Emerging Market Program supported a symposium/workshop on new developments on GE crop farming. The symposium coincided with the 10- year anniversary of the Philippines biotechnology regulations (i.e., DA-AO8). In attendance during were over 170 regulators, scientists, researchers, policy decision-makers, technology developers, seed companies, and academia.

The Department of State's Bureau of Economic and Business Affairs, in May 2012, supported the visit by a Cornell University professor who spoke at events in 3 provinces, met with key public and private sector decision makers, and helped proponents of GM crops regain the initiative in the Philippine biotechnology debate. In a province where a local ban on GE products is in place, Post partnered with a local industry group, a multinational seed company, and a major Philippines agricultural cooperative to organize a biotechnology symposium for local farmers.

From September 5-25, 2012, USDA's Country strategy Support Fund (CSSF) supported the country's largest organization of corn farmers conduct a biotechnology campaign by in 2 provinces with existing GE restrictions. The outreach helped the organization, training and participation of selected farmers-leaders to the 8th National Corn Congress. During the congress, an industry-wide resolution was submitted to the DA calling for the repeal of existing GE corn restrictions in provinces where they exist.

During the initial Bt eggplant hearing on November 20, 2012, a distinguished expert from the U.S. gave oral arguments in defense of the safety of Bt eggplant field trials and the local regulatory process. His travel was supported by funding from Embassy-Manila and the US Soybean Export Council.

In January 2013, the local corn industry organized a symposium for local farmers at the provincial capitol where an existing GE ban existed. Participant-farmers were asking for more access to GE corn

seeds saying the ban was making them more expensive in the black market. A demonstration by anti-GE groups outside the capitol failed to disrupt the symposium.

FAS Manila assisted in the participation of Philippine delegates to a regulatory workshop in emerging technologies. Held on June 25-26, 2013, the workshop came at the heels of the APEC High Level Policy Dialogue for Agricultural Biotechnology (HLPDAB) in Medan, Indonesia. Post has regularly assisted the participation of the Philippines in the HLPDAB.

Working with the Embassy's Public Affairs Section, Philippine government agencies, the academe, and various NGOs, FAS Manila organized a briefing for local media on July 1, 2013, ahead of a visit by a known anti-GE activist. Held at the Embassy-Manila, the briefing dispelled a lot of misinformation on biotechnology. The briefing featured a panel of experts from Philippine and U.S. academe, including a former president of the Philippine National Academy of Science and Technology and Minister of Science. Results were a series of pro-biotech articles in all major newspapers.

b) STRATEGIES AND NEEDS:

The growing biotechnology leadership status of the Philippines is increasingly attracting international attention and anti-biotechnology activities/attacks. As a result, the continued education on the safety and benefits of GE crops to farmers, the environment and consumers is a need.

The dramatic adoption of GE corn technology has resulted in record corn crops that have significantly increased incomes of small farmers, while reducing pesticide use. Building on the success of previous Department of State outreach activities, Post will work with Embassy-Manila in conducting outreach by a U.S. based agricultural biotechnology expert to educate decision makers in Manila and Filipino audiences in provinces where biotech planting or products are currently banned.

In addition, this campaign will include key journalists from anti-biotech provinces in order to educate them on the benefits of biotechnology. Parallel to this, local biotech advocacy partners will organize a capacity-building workshop on biotechnology for broadcasters from a network of Philippine DA-supported community radio stations. This program, which will leverage additional funds from local partners, will give these broadcasters a science-based perspective and tools to report on biotech issues for a mainly agricultural audience.

**Section VI. Animal Biotechnology:
PRODUCTION AND TRADE**

a) BIOTECHNOLOGY PRODUCT DEVELOPMENT:

There are no Philippine GE-animals currently under development or expected to be in the market for the foreseeable future.

According to a local expert, the Philippines uses conventional techniques to improve livestock, including artificial insemination, embryo transfer, in-vitro embryo production and ovum-pick. DNA-based techniques are confined to development of diagnostic kits for major animal diseases and markers, according to the same expert.

While the Philippine Carabao Center (PCC), an attached agency of the local DA, was able to develop a test tube carabao (or water buffalo) in 2004, it has since then slowed down in its research on clones.

PCC contacts report that cloning was an 'inefficient' breeding technique as mortality was an issue.

b) **COMMERCIAL PRODUCTION:**

Not applicable.

c) **BIOTECHNOLOGY EXPORTS:**

Not applicable.

d) **BIOTECHNOLOGY IMPORTS:**

Not applicable.

POLICY

a) **REGULATION:**

There is currently no legislation and/or regulations in place covering the development, use, import, and/or disposal of livestock clones, GE animals, or products derived from these animals or their offspring in the Philippines.

The PCC was created in 1992 by Republic Act 7307 or the Philippine Carabao Act of 1992 to study and promote the water buffalo as a multi-purpose animal that can be raised for milk, meat, hide, and draft. It oversees matters concerning animal biotechnology research and development in the Philippines, particularly on the breeding of a 'super' water buffalo capable of producing 4 to 18 liters of milk/day using gene-based technology (marker-assisted selection).

b) **LABELING AND TRACEABILITY:**

Not applicable.

c) **TRADE BARRIERS:**

There are no known biotechnology-related trade barriers that negatively affect U.S. exports.

d) **INTELLECTUAL PROPERTY RIGHTS (IPR):**

The Philippines currently does not have, nor is it considering legislation to address intellectual property rights for animal biotechnologies.

e) **INTERNATIONAL TREATIES/FORA:**

Not applicable.

MARKETING

a) **MARKET ACCEPTANCE:**

Not applicable.

b) **PUBLIC/PRIVATE OPINIONS:**

Anti-biotechnology groups in the Philippines have recently lobbied against the possible entry of US salmon once approved for commercial release in the U.S.

c) **MARKET STUDIES:**

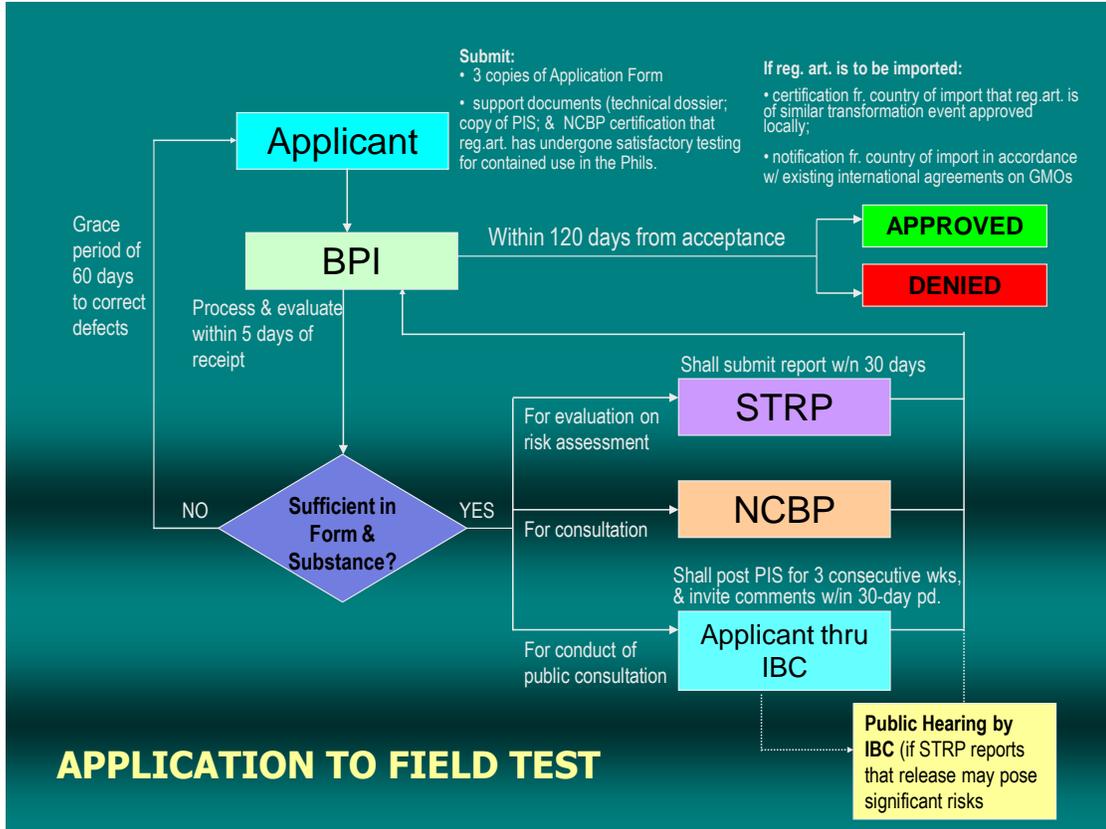
Not applicable.

CAPACITY BUILDING AND OUTREACH

a) **ACTIVITIES:**
Not applicable.

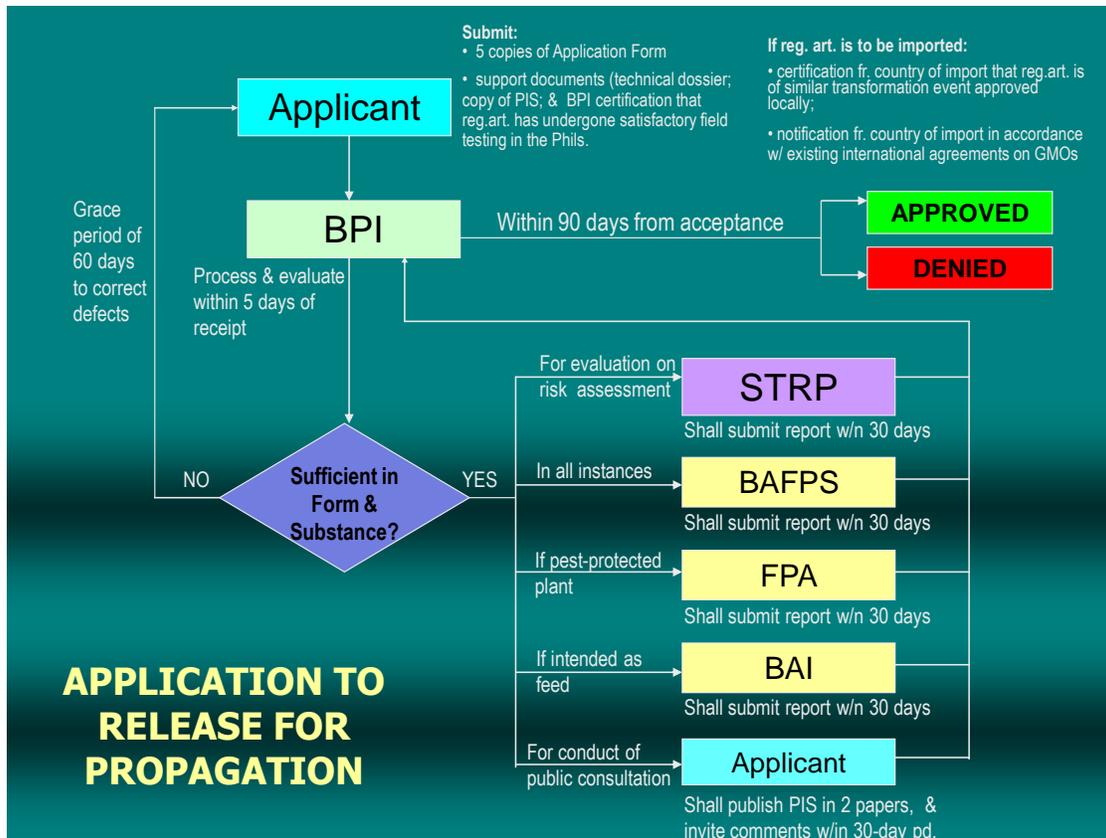
b) **STRATEGIES AND NEEDS:**
Not applicable.

Annex I - Application to Field Test



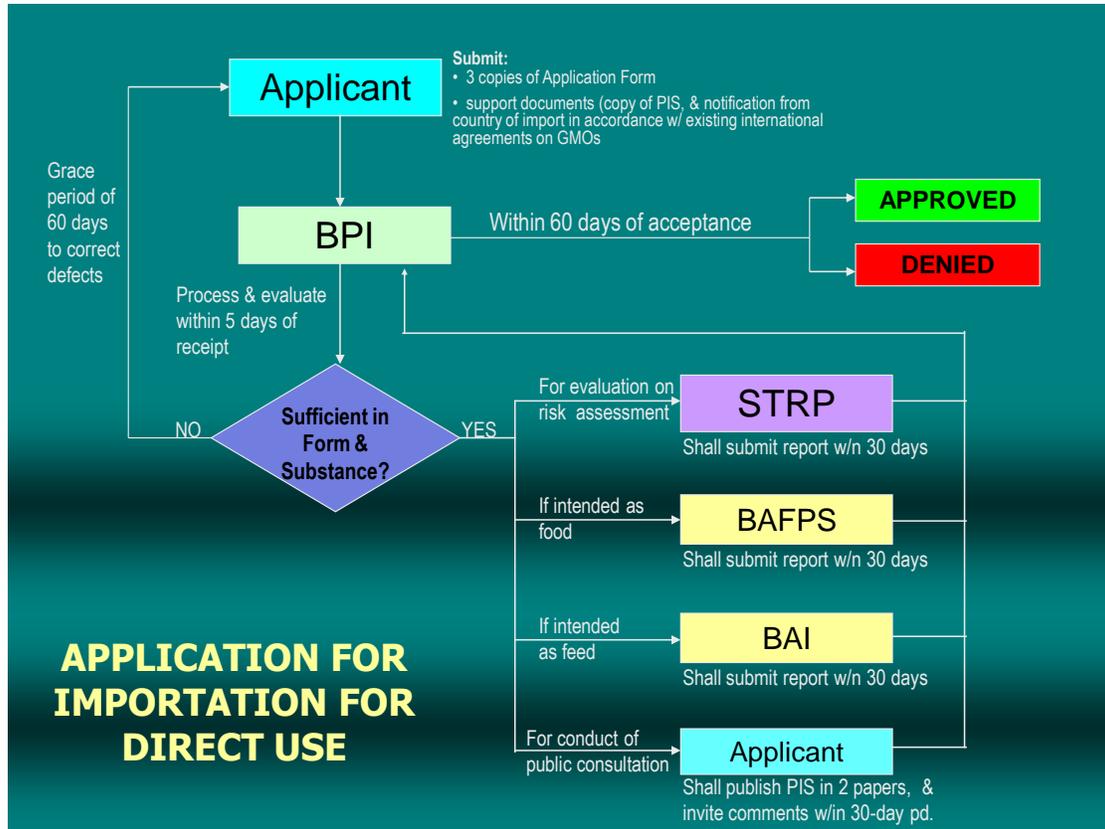
Source: Philippine Department of Agriculture

Annex II - Application to Release for Propagation



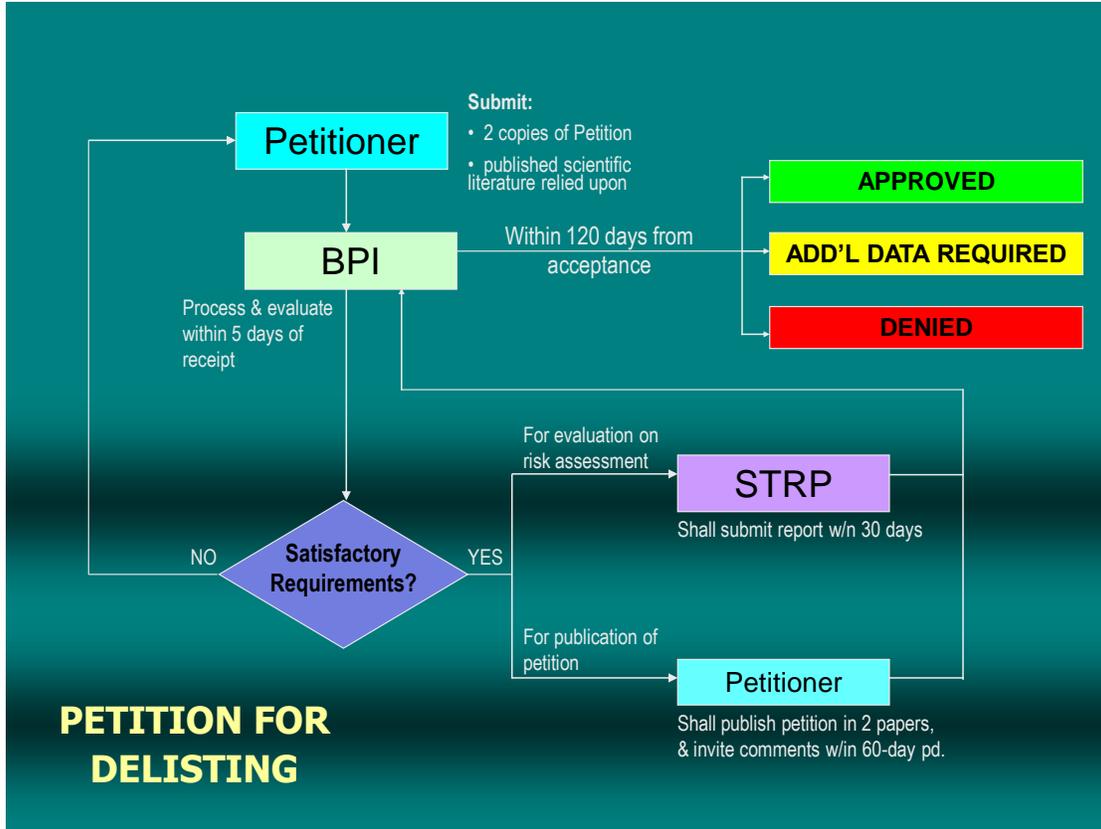
Source: Philippine Department of Agriculture

Annex III - Application for Importation for Direct Use



Source: Philippine Department of Agriculture

Annex IV - Petition for Delisting



Source: Philippine Department of Agriculture