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**Report Highlights:**

Many Caribbean Community (CARICOM) Member States have undertaken efforts to comply with their obligations under the Cartagena Protocol on Biosafety (CPB) to the Convention on Biological Diversity (CBD) since they became parties to the agreement. Progress continues to lag although regulatory structures are slowly emerging in some countries. A harmonized regional policy has been envisioned to regulate transboundary movement of products from modern plant biotechnology in a cohesive manner throughout the region.

## Executive Summary:

Several institutions within the Caribbean Basin Agricultural Trade Office's (CBATO) region are conducting biotech research on crops such as sugarcane, cassava, papaya, rice, coconuts, cocoa, coffee, peppers, and spices and to a lesser extent on ornamentals and animals [1]. This research has yielded a number of advances, including the development of transgenic papaya varieties resistant to viruses as well as the development of biochemical compounds suitable for use as bio-pesticides. However, the actual commercial production of genetically engineered (GE) products will take many years. Additionally, the Caribbean region is not yet at the stage where animal genetic engineering or cloning of animals is being developed.

The CBATO is not aware of any specific requirements related to the importation of GE products in its region. The United States is the main supplier of food and agricultural products to the region, providing approximately two-thirds of all corn, soybean, cotton and canola imports.

In the future, suppliers could encounter greater regulation of GE products as well as increased consumer awareness. Over the past several years, most of the countries within CARICOM have worked to develop their own draft National Biosafety Framework (NBF); a combination of policy, legal, administrative and technical instruments geared toward addressing safety for the environment and human health in relation to modern biotechnology [2]. This was accomplished with the support of the United Nations/Global Environment Facility (UNEP/GEF), which is helping these countries meet their obligations under the CPB [3]. To date, only St. Kitts and Nevis and St. Lucia have enacted any biosafety legislation and no country in the region has a fully functional biosafety framework in place.

[1] The CBATO islands of coverage are: Anguilla, Antigua & Barbuda, Aruba, The Bahamas, Barbados, Bermuda, British Virgin Islands, Cayman Islands, Cuba, Dominica, Guadeloupe, Martinique, Grenada, Montserrat, the former Netherlands Antilles (Curaçao, Bonaire, Sint Maarten, Saba & St. Eustatius), St. Kitts & Nevis, St. Lucia, Saint Martin, St. Barthélemy, St. Vincent & the Grenadines, Trinidad & Tobago, and Turks & Caicos Islands. For purposes of this report, Cuba is excluded from the CBATO's region of coverage.

[2] CARICOM Member States are: Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Haiti, Jamaica, Montserrat, St. Lucia, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago (CARICOM Associate Members are: Anguilla, Bermuda, British Virgin Islands, Cayman Islands, Turks and Caicos Islands).

[3] CARICOM Member States that are Parties to the CPB are: Antigua and Barbuda, The Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago. Jamaica is not part of the UNEP/GEF Regional Project for Implementing NBFs in the Caribbean because it did not ratify the CPB until after the project was initiated. Instead, Jamaica is carrying out its own NBF project.

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## CHAPTER 1: PLANT BIOTECHNOLOGY

### PART A: PRODUCTION AND TRADE

#### a) PRODUCT DEVELOPMENT:

There are no GE plants or crops under development in the CBATO region that are poised to be commercialized in the near future. Overall, agricultural production throughout the region is minimal, and most countries import the majority of their agricultural product needs. Total land area is 23,783 sq. km. (9,183 sq. miles), roughly the size of New Hampshire. Of this area, only about seven percent is arable, and an even smaller percentage is farmed.

Nonetheless, research institutions throughout the Caribbean have recognized that production of GE plants and crops could lead to increased yields and reduced use of water and inputs. These institutions have identified several local products (sugarcane, cotton, rice, coconuts, cocoa, coffee, peppers, spices, and anthuriums among others) that could be improved using agricultural biotechnology. Regional institutions conducting research on these plants and crops include the University of the West Indies (UWI), the Caribbean Agricultural Research and Development Institute (CARDI), and the National Agriculture Research Institute (NARI) in Guyana. Scientists in Trinidad and Tobago have conducted research on microbial diversity resulting in the development of antibiotics using GE techniques, for which they have already filed for a patent.

#### 1. COMMERCIAL PRODUCTION:

In the absence of a fully functioning biosafety legal framework in place to oversee the production or release of Living Modified Organisms (LMOs), countries in the region are being cautious when it comes to GE crop cultivation. In essence, there are no known field trials or commercial production of GE products taking place in the CBATO region.

#### 2. EXPORTS:

Not applicable.

#### 3. IMPORTS:

Currently, the United States is the region's main supplier of food and agricultural products. In some cases, particularly for imports of the consumer-oriented products category, products from third countries are transshipped through the United States. The following tables show the region's imports of some key GE products, including the consumer-oriented products category, which largely represents products derived from, or containing, GE corn, soybean and/or canola.

Reporting Countries Export Statistics (Partner: CBATO Islands Participating in Biosafety Project),  
**Corn**

Reporting Country	Unit	Quantity		
		2016	2017	2018
United States (Consumption/Domestic)	Tons	135,588	124,790	143,761
Belize	Tons	548	940	668
Brazil	Tons	225	6,524	475
Canada	Tons	137	131	124
Argentina	Tons	206	178	75
China	Tons	-	4	4
EU 28	Tons	100	-	-
<b>Total</b>	<b>Tons</b>	<b>136,804</b>	<b>132,567</b>	<b>145,107</b>

Source: Trade Data Monitor.

Reporting Countries Export Statistics (Partner: CBATO Islands Participating in Biosafety Project),  
**Soybeans**

Reporting Country	Unit	Quantity		
		2016	2017	2018
United States (Consumption/Domestic)	Tons	29,879	26,319	31,922
Canada	Tons	45	47	35
China	Tons	1	-	1
India	Tons	8	-	-
Brazil	Tons	-	13,000	-
<b>TOTAL</b>	<b>Tons</b>	<b>29,932</b>	<b>39,366</b>	<b>31,958</b>

Source: Trade Data Monitor.

Reporting Countries Export Statistics (Partner: CBATO Islands Participating in Biosafety Project),  
**Soybean Meal**

Reporting Country	Unit	Quantity		
		2016	2017	2018
United States (Consumption/Domestic)	Tons	48,387	38,699	56,131
Brazil	Tons	-	46,476	-
Canada	Tons	7	22	-
India	Tons	4	251	-
Serbia	Tons	23	-	-
South Africa	Tons	168	-	-
<b>TOTAL</b>	<b>Tons</b>	<b>48,589</b>	<b>85,448</b>	<b>56,131</b>

Source: Trade Data Monitor.

Reporting Countries Export Statistics (Partner: CBATO Islands Participating in Biosafety Project),  
**Soybean Oil**

Reporting Country	Unit	Quantity		
		2016	2017	2018
United States (Consumption/Domestic)	Tons	12,951	12,140	13,861
Argentina	Tons	4,450	5,061	5,703
Brazil	Tons	1,286	1,514	1,749
EU 28	Tons	792	941	1,149
Canada	Tons	689	441	569
Mexico	Tons	2	31	133
China	Tons	2	33	35
Taiwan	Tons	31	12	15
Other	Tons	20	0	0
<b>TOTAL</b>	<b>Tons</b>	<b>20,312</b>	<b>20,173</b>	<b>23,216</b>

Source: Trade Data Monitor.

Reporting Countries Export Statistics (Partner: CBATO Islands Participating in Biosafety Project),  
**Rapeseed, Colza or Mustard Oil and their fractions**

Reporting Country	Unit	Quantity		
		2016	2017	2018
United States (Consumption/Domestic)	Tons	0	52	2,001
Canada	Tons	0	4	0
<b>TOTAL</b>	<b>Tons</b>	<b>0</b>	<b>55</b>	<b>2001</b>

Source: Trade Data Monitor.

Reporting Countries Export Statistics (Partner: CBATO Islands Participating in Biosafety Project),  
**Cotton**

Reporting Country	Unit	Quantity		
		2016	2017	2018
United States (Consumption/Domestic)	Tons	53	137	31
<b>TOTAL</b>	<b>Tons</b>	<b>53</b>	<b>137</b>	<b>31</b>

Source: Trade Data Monitor

Reporting Countries Export Statistics (Partner: CBATO Islands Participating in Biosafety Project),  
**Consumer-Oriented Products**

Reporting Country	Unit	United States Dollars		
		2016	2017	2018
United States (Consumption/Domestic)	USD	604,326,794	601,979,783	595,194,018
EU 28	USD	160,987,356	173,975,454	187,544,845
New Zealand	USD	54,227,324	72,070,426	72,464,800
Brazil	USD	49,407,476	48,,030,496	48,766,032
Canada	USD	45,486,344	45,060,823	48,635,366
Costa Rica	USD	38,503,013	36,932,378	33,465,269
Uruguay	USD	14,408,235	14,956,701	19,449,161
Other	USD	729,214,394	778,896,393	724,044,310
<b>TOTAL</b>	<b>USD</b>	<b>1,092,234,142</b>	<b>1,121,892,175</b>	<b>1,134,369,783</b>

Note: Export numbers shown in US dollars to avoid inconsistencies created by different units of measure for quantity.

Source: Trade Data Monitor

4. FOOD AID:

The CBATO region is not a regular food aid recipient and the importation of GE food aid is not contemplated in any country's biosafety legislation or in the CARICOM regional policy. Further, it is unknown whether any GE products have been part of any food aid programs in the region. In 2017, several countries, such as Dominica, received small quantities of food aid, but it is unknown if this aid contained GE products.

## 5. TRADE BARRIERS:

Post is not aware of any specific requirements related to the importation of GE products in the region [1]. Within the Caribbean region, CARICOM is focused on establishing the Caribbean Single Market and Economy to facilitate the free movement of CARICOM-origin products between Member States. It remains to be seen whether CARICOM will develop and implement regional rules affecting trade in GE products.

## PART B: POLICY

### a) REGULATORY FRAMEWORK:

Most of the countries within CARICOM are seeking to address their plant biotechnology requirements through a National Biosafety Framework (NBF). To date, only St. Kitts and Nevis and St. Lucia have enacted any biosafety legislation. While an important first step toward establishing comprehensive NBFs, implementing regulations have yet to be finalized and thus the regulatory and institutional structures are not yet operational. None of the other CARICOM countries has enacted any biosafety legislation.

#### The Regional Project for Implementing NBFs

##### (1) Project Scope.

The \$13 million UNEP/GEF Regional Project for Implementing NBFs in the Caribbean, which was executed by UWI, assisted the 12 CARICOM countries that are parties to the CPB with implementation of their obligations [2]. This project was a continuation of previous UNEP/GEF biosafety capacity building efforts in the region dating back to 2001.

[1] Guadeloupe and Martinique, as overseas departments of France, may be exceptions to this statement.

[2] CBATO Islands participating in the UNEP/GEF project are Antigua and Barbuda, The Bahamas, Barbados, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, and Trinidad and Tobago. The other CARICOM participants are Belize, Guyana, and Suriname.

The overall goal of the UNEP/GEF project was to implement effective, operable, transparent and sustainable NBFs, and deliver global benefits that are compliant with the CPB in the Caribbean sub-region countries while also protecting against any potential risks from the introduction of LMOs. The four project aims were to:

- “Establish institutional (policy/legal) frameworks for biosafety at both the national and regional levels that allowed Parties to the CPB to utilize modern biotechnology in compliance with this Protocol;
- Facilitate the establishment, enhancement and operation of institutional capacities as well as technical and technological resources among the participating Caribbean Member States for the detection, assessment and management of potential risks from modern biotechnology (in combination with invasive alien species (IAS) where appropriate) at the national and regional levels;
- Develop and strengthen the human resource base and level of expertise in biosafety on a national and regional scale, in support of biosafety management and national biosafety systems in the Caribbean;
- Improve and consolidate biosafety information management within the Caribbean project countries in a way that can promote transparency, raise public awareness and facilitate biosafety decision making, and be up scaled to provide broader regional information services as needed, and if possible, establish links to information sources.”

The regional portion of the project aimed to support the establishment of a region-wide mechanism for coordinating and supporting countries in biosafety management by providing them with training on biosafety risk assessment and the management of LMOs. A key component of this is the Regional Biosafety Clearing House (R-BCH), which will include an electronic information hub to communicate with similar BCHs at the national level. The R-BCH will be responsible for:

- Managing the entire application process of LMOs intended for introduction into the environment, including distributing the information to the appropriate national BCH nodes. It will also maintain the timeline with prompts to the National Biosafety Authorities to ensure that decisions are made within the stipulated timeframe.
- Maintaining a regional roster of experts to provide assistance to countries where expertise does not exist, and to harmonize risk assessment processes in the region by pooling existing resources.
- Supporting the regional network of laboratories to provide assistance to the national regulatory agencies in monitoring and testing activities.
- Providing capacity building and carrying out public education programs.

National activities of the project would also support the establishment of the necessary legal and institutional frameworks, public education programs, and training necessary for effective and sustained implementation of the CPB. Projected country-specific outcomes included establishing:

- Functional NBFs in line with the CPB and the national and regional needs of each country;

- Functional national systems able to detect LMOs and perform risk assessments;
- Functional systems to monitor the environment and enforce regulations;
- National systems for biosafety information management while stimulating public awareness, biosafety education, and participation in the decision-making process.

## (2) Project Status.

The project, which began in November 2012, was originally scheduled to be completed by December 2015. However, due to various factors, the project ended in 2019. In addition to the project's conclusion being pushed back, the realization that the timeline for enacting biosafety legislation in each country could not be fully controlled led to the redefinition of an important project output. Rather than expecting countries to enact biosafety legislation, countries were only expected to produce draft legislation ready for Parliamentary approval. To date, only St. Kitts and Nevis and St. Lucia have passed their respective biosafety legislation. In both cases, the legislation is quite comprehensive, addressing the movement, transit, handling and use of genetically engineered products (both for food, feed and processing (FFP) and for intentional introduction into the environment), establishment of the regulatory framework for biosafety, implementation of the Cartagena Protocol on Biosafety, and other related matters. In the countries that have yet to pass their legislation, the draft laws are at different stages of becoming "Parliament-ready."

It is important to note that Barbados and The Bahamas never signed the project partnership agreement with UWI, and Suriname signed the agreement quite late into the project. This precluded these countries from drawing on any project funds for national level activities and thus fully participating in the project. These countries opted toward transferring their project country funds to the regional component of the project in order to reap some tangential benefits from the project.

The following table shows the general status of the biosafety legislation of the CBATO countries participating in the UNEP/GEF project.

<b>Country</b>	<b>Status of Legislation (as of July 2019)</b>
Antigua and Barbuda	Draft legislation is "Parliament-Ready"
The Bahamas	Draft legislation has yet to be developed
Barbados	Draft legislation has yet to be developed
Grenada	Draft legislation is not "Parliament-Ready"
Dominica	Draft legislation is not "Parliament-Ready"
St. Kitts and Nevis	Legislation passed. Will need to amend its legislation to account for the CARICOM regional policy.
St. Lucia	Legislation passed. Will need to amend its legislation to account for the CARICOM regional policy.
St. Vincent and the Grenadines	Draft legislation is not "Parliament-Ready"
Trinidad and Tobago	Draft legislation is not "Parliament-Ready"

Note: According to UWI's project management, the legislative status of other CARICOM Member States (which are not part of the CBATO's region of coverage) is as follows: a) Guyana's draft legislation is not "Parliament-Ready"; b) Suriname would need to develop its draft based on the model legislation; and c) Belize's draft legislation is "Parliament-Ready."

Source: UWI project management.

Looking ahead, UWI has contemplated the idea of a Phase II of the UNEP/GEF project, to conclude the work that could not be completed in Phase I. However, the idea is still at the concept stage and to date has not been presented to UNEP/GEF for review and approval. A Phase II project would likely seek to have legislation and implementing regulations enacted in all countries and possibly work toward developing research systems in the region. Once the legislative framework is in place, the expectation is that the Caribbean Agricultural Health and Food Safety Agency (CAHFSA), a CARICOM organization, would be charged with regional follow-up, harmonization, and sustainability of biosafety regulatory efforts. UWI's responsibilities would likely focus on assisting the R-BCH, capacity building, and supporting the laboratory network.

### (3) Harmonization Efforts.

In addition to the UNEP/GEF project efforts, CARICOM's Council for Trade and Economic Development (COTED) has passed a "Regional Biosafety Harmonization Policy." St. Kitts and Nevis and St. Lucia are reportedly in the process of amending their biosafety legislation so that it reflects this harmonized policy. Key elements of this policy include:

- The regulatory system for biosafety will be country-based and at a minimum will involve each country's agencies responsible for food safety, plant quarantine and environmental management.
- Some biosafety activities, such as risk assessment, capacity building, public education, information management, and reference laboratory testing, are to be handled at the regional level.
- Risk assessment for LMO's will be science-based.
- Risk assessment and decision making for LMO-FFPs will be science-based and grounded in the principle of substantial equivalence [1] as espoused by Codex Alimentarius. This will be done at the regional level.
- Decision-making for LMO's intended for intentional introduction into the environment and LMO's intended for contained use will be handled on a case-by-case and stage-by-stage basis. This will be done at the country level.

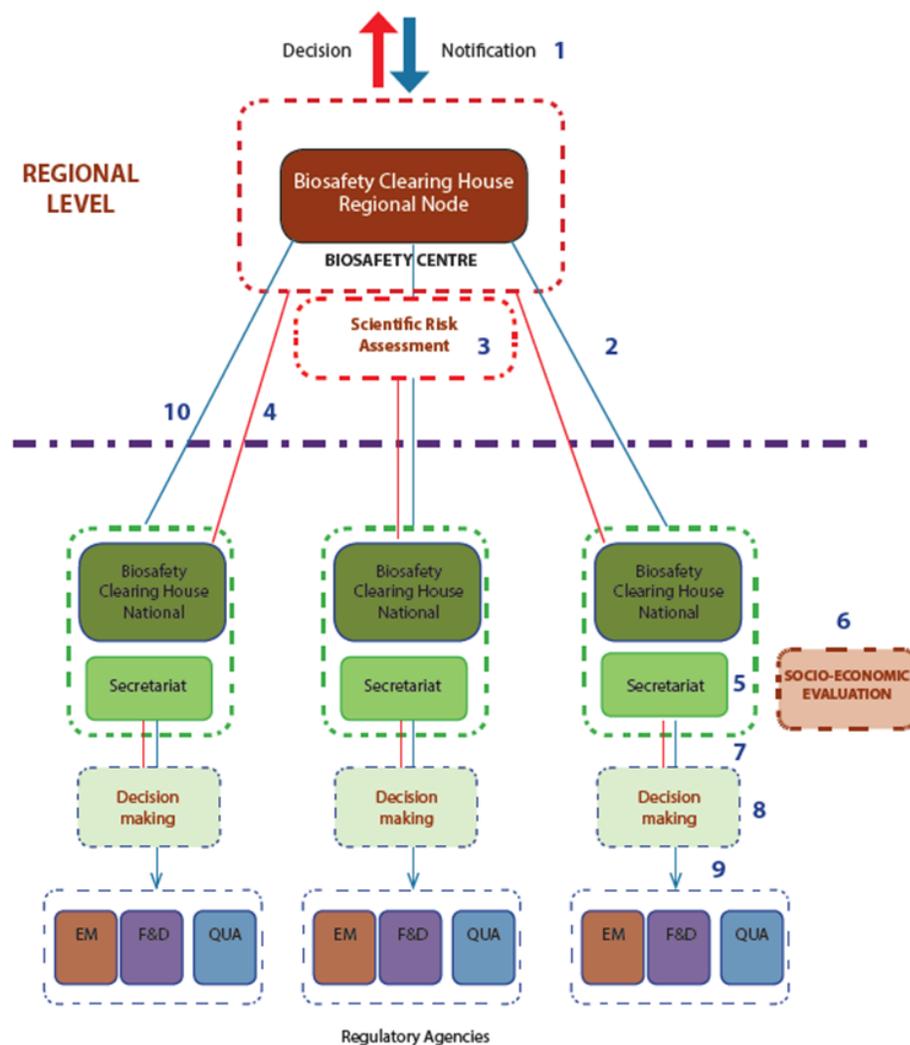
[1] In food safety, the concept of substantial equivalence holds that the safety of a new food, particularly one that has been genetically engineered, may be assessed by comparing it with a similar traditional food that has proven safe in normal use over time.

- Regulation of LMOs (each event) will be based on a one-time permit and will be based on the Advance Informed Agreement (AIA) procedure [1] at the country level.
- Biosafety information management is to be conducted through an internet-based BCH, with a regional hub and national nodes, ensuring communication and harmonization between the two.
- Food labeling policy will be based on a system of voluntary negative labeling. In other words, food manufacturers will be allowed to voluntarily identify those products that do not contain LMOs. The critical level or limit for negative labeling will be at five percent LMO content.

The following diagrams illustrate how the decision-making process would be expected to operate for both LMOs intended for intentional introduction into the environment and LMO-, under the Regional Biosafety Harmonization Policy. While each country would have its own regulatory system, they are all expected to be very similar.

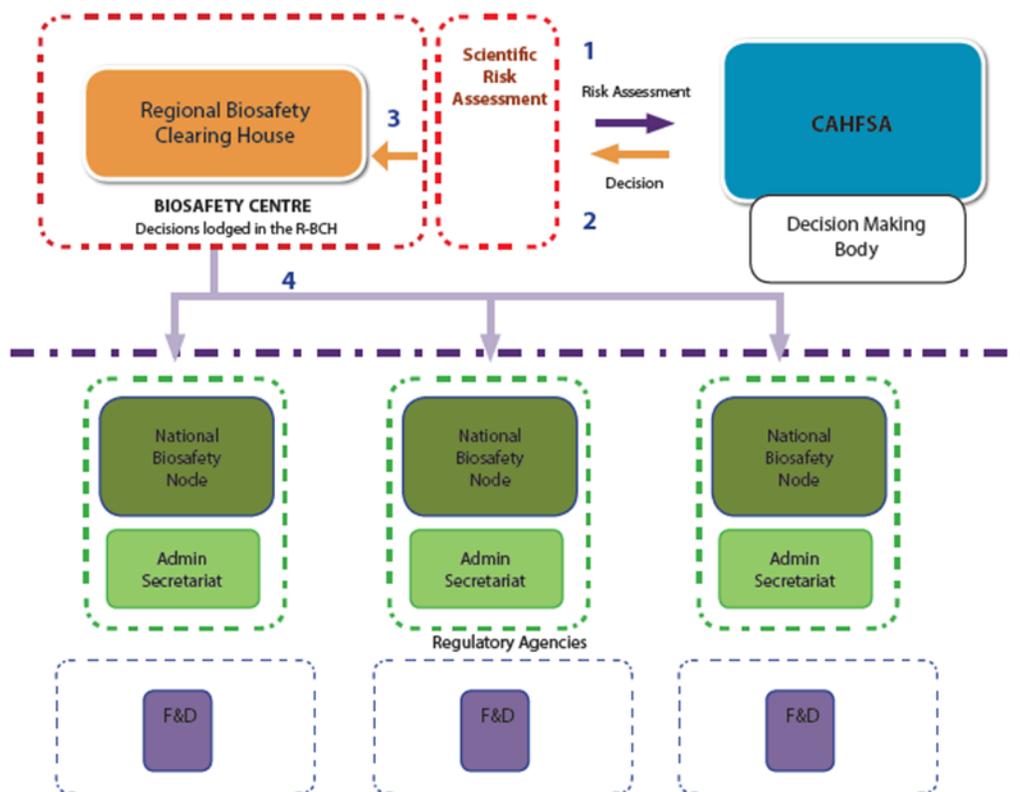
[1] Under the CPB, the AIA procedure applies to the first intentional transboundary movement of LMOs for intentional introduction into the environment of the Party of import. It includes four components: notification by the Party of export or the exporter, acknowledgment of receipt of notification by the Party of import, decision procedure and review of decisions. The purpose of this procedure is to ensure that importing countries have both the opportunity and the capacity to assess risks that may be associated with the LMO before agreeing to its import.

## Regional Harmonization of Biosafety of LMOs Intended for Intentional Introduction into The Environment



Source: Policy Brief - Regional Biosafety Harmonization, UNEP/GEF “Regional Project for Implementing National Biosafety Frameworks in the Caribbean Sub-region.”

## Regional Harmonization of Biosafety of LMO-FFP



Source: Policy Brief - Regional Biosafety Harmonization, UNEP/GEF “Regional Project for Implementing National Biosafety Frameworks in the Caribbean Sub-region.”

### b) APPROVALS:

Without all the legal and regulatory frameworks being in place, no GE plants or crops have been approved or registered in the region for cultivation, import, or export.

### c) STACKED OR PYRAMIDED EVENT APPROVALS:

The same holds true for stacked or pyramided events. Moreover, such events are not contemplated in CARICOM’s regional policy. A scientific risk assessment would need to be conducted before any approval or registration would be considered.

### d) FIELD TESTING:

No field-testing of GE crops is currently taking place.

### e) INNOVATIVE BIOTECHNOLOGIES:

The use of innovative biotechnologies (such as genome editing) in plants or plant products has not been fully contemplated in national legislation or regional policy. Thus, even when proposed biosafety regulatory systems become operational, the regulatory status of such biotechnologies will be undetermined and will likely require further assessment.

f) COEXISTENCE:

There is general recognition that LMO-FFPs are widely imported throughout the region. Thus, as mentioned earlier, risk assessment and decision-making is to be handled at the regional level. However, for LMO's intended for introduction into the environment or contained use, the situation is different. Although no rules are currently in place for coexistence of GE and non-GE crops, it is worth noting that individual countries in the region have indicated that once biosafety regulatory systems become operational, they will want to retain decision-making on this matter at the national level rather than at the regional level.

g) LABELING AND TRACEABILITY:

As a general pragmatic approach to trade (in recognition of the large volume of food imports from the United States), project participants have reportedly agreed to implement voluntary rather than compulsory negative labeling requirements for foods containing GE ingredients. As mentioned earlier, food manufacturers will be allowed to voluntarily identify those products that do not contain LMOs, with the critical level or limit for negative labeling being five percent LMO content. Labeling legislation would need to be approved before implementation could take place by the appropriate labeling enforcement authority in each country.

h) MONITORING AND TESTING:

As part of the UNEP/GEF project, the region has developed testing capability for LMO events. At the country level, participating countries have acquired lab equipment and trained lab personnel to conduct basic testing. UWI also has three regional labs with more advanced equipment, which national labs can use to conduct more advanced tests or validate their results. As a third option, the region would rely on accredited U.S. reference labs. To date, no trade has been affected by any monitoring or testing that may be taking place.

i) LOW LEVEL PRESENCE (LLP) POLICY:

The draft regional biosafety policy calls for countries to implement a five percent LLP.

j) ADDITIONAL REGULATORY REQUIREMENTS:

Not applicable.

k) INTELLECTUAL PROPERTY RIGHTS (IPR):

Given the lack of commercial production of GE crops in the region, Post is not aware of any GE-related IPR issues.

#### l) CARTAGENA PROTOCOL RATIFICATION:

Nine of the countries in the CBATO region are parties to the CPB, and while they are all in the process of trying to meet their obligations under the protocol, none has fully implemented it to date.

#### Status of Ratification and Entry into Force of the CPB

	<b>Date of Signature</b>	<b>Date instrument of ratification or accession was deposited</b>	<b>Accession Mode</b>	<b>Date of entry into force</b>
Antigua and Barbuda	May 24, 2000	Sep 10, 2003	Ratification	Dec 9, 2003
The Bahamas	May 24, 2000	Jan 15, 2004	Ratification	Apr 14, 2004
Barbados	n/a	Sep 6, 2002	Accession	Sep 11, 2003
Dominica		Jul 13, 2004	Accession	Oct 11, 2004
Grenada	May 24, 2000	Feb 5, 2004	Ratification	May 5, 2004
St. Kitts and Nevis	n/a	May 23, 2001	Accession	Sep 11, 2003
St. Lucia	n/a	Jun 16, 2005	Accession	Sep 14, 2005
St. Vincent and the Grenadines	n/a	Aug 27, 2003	Accession	Nov 25, 2003
Trinidad and Tobago	n/a	Oct 5, 2000	Accession	Sep 11, 2003

Source: Convention on Biological Diversity website (<http://bch.cbd.int/protocol/parties/#tab=0>).

Please refer to the table in PART B, sub-paragraph a, for information on the status of each country's biosafety legislation. Model legislation has also been developed to assist those countries lagging behind in their effort to produce draft biosafety legislation that is to be passed by their respective Parliament.

#### m) INTERNATIONAL TREATIES/FORUMS:

We are not aware of the region or any individual CBATO islands of coverage taking positions pertaining to agricultural biotechnologies, the use of such technologies, and products thereof in other international treaties/fora.

#### n) RELATED ISSUES:

None.

## PART C: MARKETING

### a) PUBLIC/PRIVATE OPINIONS:

As part of the UNEP/GEF project, participating countries engaged in “awareness raising activities” at the national level to educate the public on biosafety, biotechnology, bio-security and invasive species. The project also supported stakeholder consultations as part of the national processes to enact biosafety regulations. Nonetheless, overall awareness of agricultural biotechnology and GE products is quite limited. There is practically no public discussion on the matter and there are no NGO’s or public campaigns lobbying for or against agricultural biotechnology, albeit for planting GE crops or consuming foods derived from GE crops. This limited level of public/private awareness and engagement has been a contributing factor in the slow progress of adopting biosafety frameworks in the region.

### b) MARKET ACCEPTANCE/STUDIES:

There are no significant marketing issues that currently affect U.S. agricultural products.

## CHAPTER 2. ANIMAL BIOTECHNOLOGY:

### PART D: PRODUCTION AND TRADE

#### a) PRODUCT DEVELOPMENT:

The Caribbean region is not yet developing animal genetic engineering or cloning of animals. Although there has been some biotech research in Barbados on Blackbelly sheep, the region is far from having the capability to engage on specific animal biotechnology projects. However, experts in the region believe that an expansion of animal breeding using conventional and new embryo techniques as well as DNA techniques to characterize regional species would be a positive development. The use of molecular techniques to identify genes for breeding purposes will be high on the research agendas of several countries in coming years.

On a related topic, in 2016 the Government of the Cayman Islands, through its Mosquito Research & Control Unit (MRCU), partnered with the UK based biotechnology firm, Oxitec, to collaborate on a “Friendly *Aedes aegypti* Mosquito Project.” *Aedes aegypti* is a vector for Dengue Fever, Chikungunya, Zika (which has been linked to nervous system disorders and birth defects such as microcephaly), and Yellow Fever. The project uses a pioneering technique involving GE male mosquitos to fight *Aedes aegypti*. The GE males, which cannot bite, are released into the wild to mate with female *Aedes aegypti*, producing offspring that die before reaching maturity. The GE males also die within a few days. The result of the project was a greatly reduced *Aedes aegypti* population. MRCU’s collaboration with Oxitec goes back to 2009, when field releases of the GE mosquitos were conducted in Grand Cayman to

test the safety and efficiency of the technique. According to the MRCU's June 2017 Annual Report on the project, the operational deployment of GE mosquitos (which began in July 2016) yielded a 62 percent suppression of *Aedes aegypti* in the release area. Moreover, the release area has shown consistent lower levels of infestation for the whole of 2017, confirming that the population has been suppressed. While these results have been well publicized, so far the Cayman Islands is the only country within the CBATO region that has moved forward on employing biotechnology in its fight against mosquito-borne disease.

b) COMMERCIAL PRODUCTION:

Not applicable.

c) EXPORTS:

Not applicable.

d) IMPORTS:

Not applicable.

e) TRADE BARRIERS:

Although there are no known barriers to trade, it is believed that animal health and food safety authorities would treat requests for imports of GE animals, livestock clones, and offspring of clones or products from these animals, with an abundance of caution prior to granting import approval.

## PART E: POLICY

a) Regulatory Framework:

The UNEP/GEF Regional Project for Implementing NBFs in the Caribbean was originally designed to address plant biotechnology only. However, seeing the potential benefits of biotechnology use on mosquitoes as outlined above, several of the project participants have broadened their legislation so that it is no longer specific to plants.

b) INNOVATIVE BIOTECHNOLOGIES:

Not applicable.

c) LABELING AND TRACEABILITY:

Not applicable.

d) INTELLECTUAL PROPERTY RIGHTS (IPR):

Not applicable.

e) INTERNATIONAL TREATIES/FORUMS:

Not applicable.

f) RELATED ISSUES:

None.

## PART F: MARKETING

a) PUBLIC/PRIVATE OPINIONS:

As mentioned earlier, overall awareness of agricultural biotechnology and animal biotechnology specifically, is quite limited. There is no public discussion on the matter and there are no NGO's or public campaigns lobbying for or against agricultural biotechnology. However, it is believed that the public is more sensitive to animal biotechnology and would treat issues related with livestock clones, offspring of clones, and GE animals with greater caution.

b) MARKET ACCEPTANCE/STUDIES:

There are no studies that we are aware of regarding marketing of animal biotechnology products in the region. Overall acceptance of animal biotechnology by government regulators, producers, the trade and consumers remains unknown, but as mentioned above the subject is likely to be treated with a great deal of caution.

**Attachments:**

No Attachments