



MEXICO'S ENVIRONMENTAL LAW IN THE GMO ERA

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I. OVERVIEW

Mexico’s environmental legislation is rooted in the Constitution of the United Mexican States of 1917.¹ Article 4 provides for the right of all persons to an adequate environment for their development.² Although general, this suggests a concern for the environment and for human health. In addition, article 27 of the Constitution regulates the ownership of lands and waters in Mexico while detailing the obligation of the Mexican government “to preserve or restore the ecological balance” of the land”.³ Article 73 empowers Congress to delimit the powers of the States and municipalities regarding environmental protection.⁴

At the federal level, several laws aim to preserve biological resources and regulate Living Modified Organisms (LMOs). One such law is the General Law of Ecological Equilibrium,⁵ which establishes the basis for environmental protection in Mexico. This law allocates authority among states and the federation and attempts to coordinate the federal agencies that are responsible for protecting the environment.⁶

¹ Constitución Política de los Estados Unidos Mexicanos [Const.], as amended on July 7th, 2008, Diario Oficial de la Federación [D.O.] 5 de febrero de 1917 (Mex.), available at: <http://constitucion.presidencia.gob.mx/index.php?idseccion=210> (last visited: January 12, 2007).

² *Id.* at art. 4.

³ *Id.* at art. 27.

⁴ *Id.* at art. 73. For a comprehensive explanation of Mexican Law, see STEPHEN ZAMORA ET AL., MEXICAN LAW (Oxford University Press, 2004).

⁵ Ley General de Equilibrio Ecológico [L.G.E.E.] [General Law of Ecological Equilibrium], as amended February 23th, 2005, Diario Oficial de la Federación [D.O.] 28 de enero de 1988 (Mex.), Available at: <http://www.cddhcu.gob.mx/leyinfo/pdf/148.pdf> (last visited: January 10, 2007).

⁶ *Id.* at arts. 4-14.

The General Law of Ecological Equilibrium also contains provisions with respect to EIA (Environmental Impact Assessment) to be undertaken prior to the disposal of hazardous waste, and prior to the import, export, and introduction of genetic material into the environment.⁷ Additionally, subordinate legislation to the General Law of Ecological Equilibrium, the Regulations on Environmental Impact Assessment,⁸ sets out federal guidelines and standards to evaluate and perform impact assessments of activities that could negatively alter ecological equilibrium.⁹

Also at the federal level, the Law on Plant Health¹⁰ regulates the use of transgenic material and its introduction into the environment. It does this by requiring phytosanitary certification prior to their commercialization. Also, the Law on the Production, Certification and Commerce of Seeds¹¹ imposes permit requirement procedures for activities involving experimentation with transgenic crops and their introduction into the environment.¹²

Biotechnology and LMOs are regulated by means of the recent Biosafety Law on Genetically Modified Organisms (GMOs).¹³ This law makes use of the broad term “GMO” to regulate both LMOs and GMOs,¹⁴ as well as the introduction of LMOs into the environment upon meeting the criteria of a permit procedure.¹⁵ It also contemplates GMO-free zones to protect native plants and for certification purposes required for the production of organic

⁷ The General Law of Ecological Equilibrium refers to LMOs as “genetic material” or “living organisms resulting from biotechnology”. *Id.* at 3 section (V).

⁸ Reglamento de la Ley General del Equilibrio Ecológico y la Protección al Ambiente en materia de Evaluación de Impacto Ambiental [R.L.G.E.E.P.A.M.E.I.A.] [The Federal Regulatory Law for Ecological Equilibrium in matters of Regulatory Impact Assessment] Diario Oficial de la Federación [D.O.] May 30, 2000. These regulations develop and expand on the Environmental Impact Assessment contained in the Law for Ecological Equilibrium and establishes a national framework for environmental protection.

⁹ *Id.* at art. 5.

¹⁰ Ley de Sanidad Vegetal [L.S.V.] [Law on Plant Health], Diario Oficial de la Federación [D.O.] Jan. 05, 1994, available at: <http://www.diputados.gob.mx/LeyesBiblio/pdf/117.pdf>. (last visited: January 12, 2007).

¹¹ Ley Federal de Producción, Certificación y Comercio de Semillas [L.P.C.C.S.] [Law on the Production, Certification and Commerce of Seeds], Diario Oficial de la Federación [D.O.] July 15, 1991, available at: <http://www.sagarpa.gob.mx/mnormativo/pdf/leyes/L001.pdf#search=%22Ley%20de%20produccion%20y%20comercializacion%20de%20semillas%22> (last visited: January 12, 2007).

¹² *Id.* at arts. 1-3.

¹³ Ley de Bioseguridad de Organismos Genéticamente Modificados [Biosafety Law on GMOs] Diario Oficial de la Federación [D.O.] March 18, 2005, available at: http://www.cddhcu.gob.mx/leyinfo/pdf/Ley_BOGM.pdf (last visited: January 10, 2007), at arts. 86-87.

¹⁴ *Id.* at art. 2.

¹⁵ The Secretariat of the Environment, the Secretariat of Agriculture or the Secretariat of Health may authorize the introduction of LMOs in their respective areas.

products.¹⁶ Public participation is also contemplated in this law as a democratic tool for decision-making.¹⁷

Parallel to this federal legislation are the Official Mexican Standards (NOMs) created by the National Standardization Commission and the federal secretariats on issues within their competence.¹⁸ One such NOM is the 1995 NOM-056-FITO.¹⁹ This standard establishes phytosanitary requirements for transportation, import and experimental trials of genetically manipulated organisms in the country.²⁰ Mexican Federal States also have legislative power to enact environmental protection laws within their respective areas of jurisdiction and in accordance with the Mexican Constitution.²¹

This comment will focus on an analysis of Mexican environmental legislation that plays various roles in the conservation of biological diversity. It will take into account general commitments established at the international level in the United Nations Convention on Biological Diversity (CBD)²² and the Cartagena Protocol on Biosafety (Cartagena Protocol).²³

¹⁶ Ley de Bioseguridad de Organismos Genéticamente Modificados [D.O.] March 18, 2005 at art. 86-87. The Biosafety Law on GMOs employs these terms indistinctly although they are different for some. The term LMO refers to organisms that have been modified by the use of biotechnology techniques and to those that are capable of replicating. Genetically Modified Organisms (GMOs), on the other hand, are not defined in the CBD or the Cartagena Protocol and portray dormant organisms that have been genetically modified by the use of biotechnology. The term GMO may be used to refer to LMOs when employed in Mexican legislation. See IUCN ENVIRONMENTAL LAW CENTRE, AN EXPLANATORY GUIDE TO THE CARTAGENA PROTOCOL ON BIOSAFETY, available at: http://pdf.wri.org/biosafety_guide.pdf, at 45, 56-59 (accessed: January 10, 2007).

¹⁷ *Id.* at art. 2 section XIV.

¹⁸ NOMs are mandatory standards enforced by one or more of the Mexican Secretariats, stating the characteristics and requirements products must meet for their safety and procedures that must be followed to protect people and the environment from harm. One example of an Official Mexican Standard is NOM-056-FITO-1995 developed by the Secretariat of Agriculture and Rural Development which establishes guidelines for the environmental control and protection. According to this standard, the proponent is obliged to request phytosanitary permission to introduce LMOs into the environment for research purposes. In the petition, the proponent must include characteristics of the organisms, place of introduction, route of transportation, etc.

¹⁹ SAGARPA, NOM-056-FITO-1995, available at: http://www.cibiogem.gob.mx/normatividad/normatividad_SAGARPA/NOM-056-FITO-1995.html (last visited: January 12, 2007).

²⁰ *Id.*

²¹ Ley General de Equilibrio Ecológico [D.O.] 28 de enero de 1988 at art. 8.

²² United Nations Convention on Biological Diversity, June 5, 1992, 31 I.L.M. 818, entered into force on December 29, 1993. Mexico ratified the CBD on March 11, 1993, available at: <http://www.cbd.int/doc/legal/cbd-un-en.pdf> (last visited: June 4, 2007) [Hereinafter Convention on Biological Diversity].

²³ Available at: <http://www.biodiv.org/biosafe/BIOSAFETY-PROTOCOL.htm> (Mex-

The rest of the comment is organized into three sections. Section II discusses Mexico's environmental legislation and section III gives a conclusion that draws together the weaknesses and shortfalls of the legal regime in light of the purpose of biodiversity conservation which it is otherwise designated to ensure.

II. MEXICAN LEGISLATION

Mexico's environmental legislation has been evolving since the beginning of the 1970s. Early legislation was specifically created to deal with environmental problems and the effects of environmental degradation on human health. This was the case of the 1971 Law to Prevent and Control Environmental Pollution.²⁴ It is also important to note that at that time, several legislative reforms took place that gradually empowered the government to take appropriate actions against environmental pollution.²⁵ One such measure was the creation of the 1982 Federal Law of Environmental Protection, which exhibited an enhanced commitment to preserve the environment in contrast to previous legislation.²⁶

Constitutional reforms in 1971 and 1987 granted the Mexican Congress authority to legislate on environmental matters.²⁷ Consequently, in 1988, the General Law of Ecological Equilibrium and Environmental Protection was created.²⁸ It offered a more comprehensive approach to environmental conservation. Unlike previous legislation, this law went beyond preserving the environment in its consideration of the importance of biological resources.²⁹

Continuous legal reforms and specialized legislation continue to shape Mexico's environmental law regime. One such reform is the 2005 Biosafety Law on GMOs,³⁰ which constitutes the most advanced legislation that addresses the threat of LMOs to biological resources. A description and analysis of these laws follows.

ico ratified the Cartagena Protocol on September 11, 2003) (last visited: June 4, 2007) [Hereinafter Cartagena Protocol].

²⁴ *Id.*

²⁵ José M. Vargas, "The Development of Mexico's Environmental Legislation", Mexican National Institute of Ecology, available at: <http://www.ine.gob.mx/ueajei/publicaciones/libros/395/vargas.html> (last visited: January 12, 2007).

²⁶ *Id.*

²⁷ JESÚS QUINTANA, DERECHO AMBIENTAL MEXICANO: LINEAMIENTOS GENERALES 44 (Porrúa, 2002).

²⁸ Ley General de Equilibrio Ecológico [D.O.] 28 de enero de 1988.

²⁹ QUINTANA, *supra* note 27.

³⁰ Ley de Bioseguridad de Organismos Genéticamente Modificados [D.O.] March 18, 2005.

1. *The Mexican Constitution*

The Mexican Constitution contains general provisions that show regard for the environment and natural resources. Two such provisions are found in articles 27 and 73.³¹ These articles lay the environmental framework upon which Mexico's environmental legislation is built.³² Article 27 regarding natural resources states:

The Nation shall at all times have the right to impose on private property such limitations as the public interest may demand, as well as the right to regulate the utilization of natural resources which are susceptible of appropriation, in order to conserve them and to ensure a more equitable distribution of public wealth... and to prevent the destruction of natural resources.³³

This provision is the result of extensive reforms that occurred in 1971 and 1987 and enhanced the authority of the federal government in the task of preserving the environment.³⁴ Article 27 emphasizes the right of the State to regulate the utilization of natural resources and imposes on it the specific obligation to preserve them.³⁵ On the basis of this provision, the Mexican government can extensively regulate activities that potentially impact the environment by means of specialized federal laws, national standards or norms on the use of natural resources.

Article 73 also contains several provisions that impact the regulation of natural resources. In general, it states that the Mexican Congress has: "The power to make laws that establish agreement of the Federal Government and of the governments of the States and municipalities, in the areas of their respective jurisdictions, in matters of protection of the environment and preservation and restoration of ecological balance".³⁶

This provision goes beyond regulating the use of natural resources. It empowers Congress to define competencies regarding environmental protection, not only at the federal, but also at the State and municipal levels. The enhanced authority vested in Congress to delineate environmental re-

³¹ Constitución Política de los Estados Unidos Mexicanos [D.O.] Feb. 5, 1917 at art. 27, 73.

³² CEC, LAW AND ENVIRONMENTAL POLICY IN NORTH AMERICA 160 (Commission for Environmental Cooperation, 1998), available at: http://www.cec.org/files/pdf/LAW_POLICY/vol-2s_ES.pdf (last visited: January 12, 2007).

³³ Constitución Política de los Estados Unidos Mexicanos [D.O.] Feb. 5, 1917 at art. 27.

³⁴ Micheli, Jordy, *Política ambiental en México y su dimensión regional*, XIV REGIÓN Y SOCIEDAD 23, 137-139 (2002).

³⁵ Constitución Política de los Estados Unidos Mexicanos [D.O.] Feb. 5, 1917 at 227.

³⁶ *Id.* at art. 73 section XIX(G).

sponsibilities at the constitutional level and the inclusion of Mexico's commitment to preserve the environment in the Constitution has the potential not only to unify and strengthen environmental preservation in Mexico, but also to coordinate legislation and institutions for this purpose across the various levels of government.

In addition to articles 27 and 73, there are general provisions in the Constitution regarding the environment. These are contained in articles 4 and 25.³⁷ Article 4 states that all "individuals have a right to an adequate natural environment for their development and welfare".³⁸ This provision considers the environment an important factor in the development of individuals and acknowledges the potential effects of a deteriorated environment on human beings. It also shows, at least on paper, concern for the preservation of the environment.³⁹ Article 25 is concerned with regulating economic activities across the country.⁴⁰ This article states that resources utilized in production and "natural resources shall be preserved",⁴¹ implying that economic activities should take into account resources and environment preservation.⁴²

General provisions such as articles 4 and 25 tangentially address environmental protection and resources preservation. However, they are not implemented by federal legislation nor can they be directly invoked in court.⁴³ Consequently, only articles 27 and 73 can be relied upon to pursue the goal of preserving the environment. Although biodiversity is not specifically mentioned in the Constitution, the relevant articles discussed imply that said articles consider the conservation of biodiversity necessary for the welfare and development of Mexico and its citizens.⁴⁴

We now turn to an analysis of Mexico's federal laws and national environmental standards in terms of how far their provisions could preserve Mexico's biological resources and regulate the introduction and spread of LMOs.

³⁷ *Id.* at arts. 4, 25.

³⁸ *Id.* at art. 4.

³⁹ In 2000 a legislative initiative by Mexico's Green Party attempted to reform article 4 of the Mexican Constitution of 1917 to force polluters to compensate for environmental harm. Legislative Initiative, Green Party (7 November 2000), available at: http://www.diputados.gob.mx/sia/coord/pdf/refconst_lviii/archivos_doc/009.doc (last visited: January 12, 2007).

⁴⁰ *Id.* at art. 25.

⁴¹ *Id.*

⁴² *Id.*

⁴³ MARÍA DEL CARMEN CARMONA, DERECHOS RELACIONADOS CON EL MEDIO AMBIENTE 10-12 (UNAM, 2000), available at: <http://www.bibliojuridica.org/libros/1/66/tc.pdf> (last visited: January 12, 2007).

⁴⁴ Constitución Política de los Estados Unidos Mexicanos [D.O.] Feb. 5, 1917 at art. 4.

2. *General Law of Ecological Equilibrium and Environmental Protection*

The General Law of Ecological Equilibrium⁴⁵ is the backbone of Mexico's environmental law. It is the result of constitutional reforms introduced in 1987 to modernize its predecessor, the Federal Law of Environmental Protection of 1982.⁴⁶ The objectives of the General Law of Ecological Equilibrium with respect to conserving biodiversity are, as stated in article 1:

- II. To define environmental policy and guarantee its implementation;
- III. The preservation, restoration and the betterment of the environment;
- IV. The preservation and protection of biological diversity and the creation and management of a system of protected areas to preserve biological diversity and to establish a system of protected areas.⁴⁷

The General Law of Ecological Equilibrium offers the opportunity for a comprehensive approach to dealing with Mexico's environmental problems. This is because it is a framework upon which specialized federal laws and regulations must be based.⁴⁸ It sets the basis for regulating various areas of environment-impacting activity, such as nuclear energy, protected areas, biodiversity, atmospheric contamination and hazardous waste.⁴⁹

The General Law of Ecological Equilibrium follows a sustainable development approach to preserve the environment.⁵⁰ It reiterates the constitutional commitment to guarantee the right of individuals to an adequate environment and it defines Mexico's environmental policy and instruments for its implementation.⁵¹ Furthermore, this law provides coordination mechanisms for national and state environmental institutions and legislation.⁵² It also makes provisions to facilitate the formulation and execution of actions to preserve biological diversity and the use of "genetic material" country-wide.⁵³

The General Law of Ecological Equilibrium considers the preservation of biodiversity and the use of genetic material a public issue.⁵⁴ It considers

⁴⁵ Ley General de Equilibrio Ecológico [D.O.] 28 de enero de 1988.

⁴⁶ QUINTANA, *supra* note 27 at 54.

⁴⁷ Ley General de Equilibrio Ecológico [D.O.] 28 de enero de 1988 at art. 1.

⁴⁸ *Id.*

⁴⁹ George R. González, *Overview of Environmental Laws of Mexico*, (2000) 9 CURRENTS INT'L TRADE L.J. 49, at 50.

⁵⁰ *Id.* at 56.

⁵¹ Ley General de Equilibrio Ecológico [D.O.] 28 de enero de 1988 at art. 1

⁵² *Id.*

⁵³ *Id.* at art. 2 (III).

⁵⁴ *Id.* at art. 2.

“genetic material” similar to Living Modified Organisms. It defines genetic material as “all material of vegetal, animal or microbial origin or of other type that contains functional units of heredity”.⁵⁵ In addition, it defines biological resources as composed of genetic resources, organisms, populations of biotic components and ecosystems.⁵⁶ The General Law of Ecological Equilibrium’s definition, although different from that one employed in the CBD, encompasses several components also covered under the Convention.⁵⁷

Overall, the General Law of Ecological Equilibrium has been considered a law that provides for an integrated approach to deal with Mexico’s environmental problems. Three outstanding elements comprise this law: environmental and risk assessment requirements; the establishment of protected and restoration zones; and, enforcement mechanisms to achieve its objectives.

A. *Environmental Impact and Risk Assessments*

Environmental impact assessment was consolidated in Mexico with the creation of the Secretariat of the Environment in 1994. This environmental institution proposed extensive reforms to the General Law of Ecological Equilibrium in 1996, aiming to improve the EIA procedure.⁵⁸ As a result, EIA provisions clearly establish which activities require said assessment. The provision also allows for public participation in the process.⁵⁹ Furthermore, the Federal Regulations on EIA were enacted in June 2000 to assist in the implementation of the General Law of Ecological Equilibrium’s provisions on EIA.⁶⁰

Apart from EIA, the General Law of Ecological Equilibrium also provides for the use of risk assessment in an effort to preserve biological resources. These two procedures are used jointly when activities are likely to dramatically alter ecological equilibrium.⁶¹ The activities that require an impact and risk assessment include those involving transgenic material, such as the introduction of LMOs into the environment.⁶² It is important to note that neither the General Law of Ecological Equilibrium nor the Fed-

⁵⁵ *Id.* at art. 3 (XXII).

⁵⁶ *Id.* at art. 3 (XXI-XXVII).

⁵⁷ Convention on Biological Diversity at art. 2.

⁵⁸ INE, ENVIRONMENTAL IMPACT ASSESSMENT: ACHIEVEMENTS AND CHALLENGES FOR SUSTAINABLE DEVELOPMENT 1995-2000, National Institute of Ecology, General Directorate of Law and Environmental Impact Assessment, at 50-53.

⁵⁹ *Id.* at 53-54.

⁶⁰ *Id.*

⁶¹ Ley General de Equilibrio Ecológico [D.O.] 28 de enero de 1988 at art. 28.

⁶² INE, *supra* note 58 at 82.

ral Regulations provide for the use of Strategic Environmental Assessment in environmental policies.⁶³

The General Law of Ecological Equilibrium provides that the following activities require an environmental impact assessment: hydraulic and projects in the oil industry; mining; treatment of hazardous waste or radioactive material; activities in wild forests; changes in the use of land and industrial parks; activities involving coastal ecosystems; activities in protected areas, and activities that can have an impact on marine ecosystems.⁶⁴

As to activities covered under national standards and regulations, such as discharges or emissions or when such activities are performed in authorized industrial parks, the General Law of Ecological Equilibrium only requires a preventive report.⁶⁵ Preventive reports include the name of the project, a particular application provided by the Secretariat of the Environment and reference to the Official Mexican Standards applicable to the activity. Based on this report, the SEMARNAT can also decide within twenty days of receiving such report to request an impact assessment if it considers that the activity may harm the environment.⁶⁶

The EIA procedure is initiated by a proponent's request before the Secretariat of the Environment. The request must contain: first of all, an environmental impact statement (EIS), which contains detailed information on the project or activity that may alter or impact the environment, such as the construction of gas plants, oil plants, etc. The EIS must include information on activities that will be performed and the development plans of the project. Second, a legal analysis of the project's compliance with national legislation and regulations must be provided.⁶⁷ Third, the economic development path of the project and its potential environmental impact on the local and regional area must be set out. Fourth, identification, description and evaluation of the direct and indirect environmental impacts of the proposed activity must be provided in terms of mitigating and preventive measures.⁶⁸ Fifth, an evaluation of alternative locations, and sixth, an analysis of the

⁶³ Although Strategic Environmental Assessment is not expressly mentioned in the Federal Regulations on Environmental Impact Assessment, of the General Law of Ecological Equilibrium, the Organization for Economic Co-operation and Development (OECD) points out that efforts to use this important planning tool have been taking place in the tourism sector since 2006. See Organization for Economic Co-operation and Development, *Applying Strategic Environmental Assessment: Good Practice Guidance for Development Co-operation*, Guideline and Reference Series, 2006, available at: http://www.oecd.org/data_oecd/4/21/37353858.pdf (last visited: January 12, 2007).

⁶⁴ Ley General de Equilibrio Ecológico [D.O.] 28 de enero de 1988 at art. 28.

⁶⁵ *Id.* at art. 31.

⁶⁶ *Id.*

⁶⁷ *Id.*

⁶⁸ *Id.*

methodology employed in the impact assessment must be detailed in the EIS.⁶⁹

Other than the EIA requirements, proponents must also include a risk assessment of the proposed activity where potential harm to the environment is envisaged, such as those projects or activities involving genetic material and LMOs. The risk assessment must be based on the technical information on the environment and on the activity contained in the impact statement. The risk assessment report must contain: first, a detailed analysis of the environmental risks of the project; second, possible scenarios and preventive measures regarding the risks of the proposed project; third, a delimitation of buffer protection zones in the surrounding areas; and, fourth, safety measures to protect from environmental harm.⁷⁰

Once the Secretariat of the Environment receives an application from the proponent, it will evaluate the impact and risk assessment documents within sixty days, after which it will decide if it will allow the activity to proceed.⁷¹ The Secretariat of the Environment also will conduct the necessary tests or request additional information if required for the approval of the project.⁷² It is important to note that the General Law of Ecological Equilibrium makes use of general forms for presenting EIAs for the activities covered under article 28. It also employs NOMs to regulate the oil, electric and communications industries in terms of their potential impact on the environment. The NOMs prescribe the technical requirements to be met on matters to be considered in the assessment of the aforementioned activities.⁷³

B. *Protected Areas and Restoration Zones*

Besides the EIA and risk assessment procedures, the General Law of Ecological Equilibrium also makes provision for preserving Mexico's biological diversity by means of a sophisticated system of protected areas, in-

⁶⁹ *Id.*

⁷⁰ Reglamento de la Ley General del Equilibrio Ecológico y la Protección al Ambiente en materia de Evaluación de Impacto Ambiental [D.O.] May 30, 2000 at art. 18.

⁷¹ Ley General de Equilibrio Ecológico [D.O.] 28 de enero de 1988 at art. 35.

⁷² *Id.* arts. 34-35.

⁷³ *Id.* at arts. 152-153. NOM-113-ECOL-1998 establishes specifications for the planning and operation of electric plants to be located in urban areas; NOM-120-ECOL-1997 establishes specifications aimed at preserving the environment with mining activities; NOM-114-ECOL-1998 establishes guidelines to be considered for electric transmission in urban areas; NOM-115-ECOL-1998 establishes specifications regarding soil exploitation in the oil industry; NOM-116-ECOL-1998 provides guidance for the preservation of agricultural zones and livestock; NOM-117-ECOL-1998 establishes guidelines for the transportation of oil derivatives; NOM-130-ECOL-1998 provides specifications regarding the operation, planning and design of telecommunication activities and the use of fiber optic cables.

cluding their management regimes.⁷⁴ The system of protected areas in Mexico comprises biosphere reserves, national parks, natural monuments, areas of protected natural resources, areas for the preservation of fauna and flora, natural sanctuaries, park and state reserves, and areas for the preservation of ecological zones.⁷⁵

Under this law, the system of protected areas is meant to preserve representative elements of the different climatic and geographic areas in the country,⁷⁶ to preserve endangered species and to ensure the sustainable use of biological diversity in the country.⁷⁷

Another measure contemplated in the General Law of Ecological Equilibrium is the restoration of deteriorated zones to thus preserve biological resources. According to this law, in cases of extreme loss of biodiversity, the Secretariat of the Environment can propose to the Executive Branch the creation of restoration zones in places that face degradation problems.⁷⁸ The law also provides for biodiversity conservation, the protection of flora and fauna and the ecological processes of biological resources and endangered species.⁷⁹

The General Law of Ecological Equilibrium mandates the elimination of illegal traffic in species and the development of research on the genetic materials of flora and fauna to acquire knowledge of the potential scientific, environmental and economic value of such materials.⁸⁰ The General Law of Ecological Equilibrium also regulates the import, propagation and export of flora, fauna and genetic material by means of a permission mechanism overseen by this Secretariat.⁸¹

Under the General Law of Ecological Equilibrium, environmental impact and risk assessment and the usefulness of protected areas and restorations zones depend on how well this oversight is enforced.

C. *Enforcement*

The Secretariat of the Environment enforces the General Law of Ecological Equilibrium provisions in three ways: first, by means of audits and monitoring inspections; second, by imposing administrative sanctions;⁸² and third, by means of public participation in the EIA procedure and the

⁷⁴ Ley General de Equilibrio Ecológico [D.O.] 28 de enero de 1988 at art. 44.

⁷⁵ *Id.*

⁷⁶ *Id.*

⁷⁷ *Id.* at art. 45.

⁷⁸ *Id.* at art. 78.

⁷⁹ *Id.*

⁸⁰ *Id.* at art. 79.

⁸¹ *Id.* at art. 82.

⁸² *Id.* at arts. 160-166.

public complaint procedure overseen by the Attorney General for Environmental Protection.⁸³

Monitoring and compliance is ensured by means of inspector visits and audits conducted by the Secretariat of the Environment.⁸⁴ Inspectors verify compliance with the commitments or conditions included in authorized impact assessments. By means of audits, compliance with emissions established in official standards is assessed. Pecuniary sanctions are imposed on those responsible for altering ecological equilibrium or causing environmental deterioration.⁸⁵ Administrative sanctions include fines as high as 15,000 USD,⁸⁶ revocation of licenses and administrative arrest for thirty-six hours.⁸⁷

After risk and impact assessment procedures have been presented to the Secretariat of the Environment and fulfill the legal and formal requirements, a public consultation procedure can be requested by any citizen. This procedure is controlled by the Secretariat of the Environment and is aimed at incorporating public views and suggestions into carrying out the proposed project. The idea behind public participation in the EIA is that average citizens can provide insight to the Secretariat of the Environment because of their familiarity with the project and surrounding areas.⁸⁸

Another tool employed to oversee the implementation of the General Law of Ecological Equilibrium and, in general, Mexican environmental law, is the public complaint procedure.⁸⁹ This procedure accomplishes three objectives: first, it helps the Secretariat of the Environment implement the General Law of Ecological Equilibrium's requirements regarding environmental protection; second, the complaint procedure provides an inexpensive means to ensure compliance with Mexican environmental law; and third, the procedure empowers society to play a broader role in the preservation of Mexico's resources and will consequently contribute to create a culture of respect for the environment.⁹⁰

Overall, the General Law of Ecological Equilibrium offers a comprehensive approach to integrate Mexican environmental protection measures. It provides a broad framework upon which federal laws and regulations can be based. The EIA procedure prescribed by the General Law of Ecological Equilibrium has the potential to help preserve biological diversity from harmful individual projects. But the procedure lacks guidelines for uniform

⁸³ *Id.* at art. 189

⁸⁴ *Id.* at arts. 160, 171.

⁸⁵ *Id.* at art. 171 sections I- III.

⁸⁶ *Id.*

⁸⁷ *Id.*

⁸⁸ *Id.* at arts. 28-31.

⁸⁹ *Id.* at arts. 189-203.

⁹⁰ *Id.*

application and fails to include Strategic Environmental Assessment for federal policies or plans.

Official Mexican Standards, although available in the implementation of the General Law of Ecological Equilibrium, are only concerned with activities in the oil, electric and communications industries and their impact on the environment. NOMs are necessary to establish guidelines for evaluating EIA. Moreover, the potential effectiveness of audits and inspection visits to enforce environmental laws remains low unless financial resources are made available to carry them out. So far, such resources have barely been adequately provided.

Although the General Law of Ecological Equilibrium does not specifically regulate LMOs, it has the potential to address the risks posed by these organisms in the absence of biosafety legislation in Mexico. It could also complement biosafety legislation when such legislation has unclear provisions. LMOs, for example, could be regulated under activities that may alter ecological equilibrium. Risk and impact assessments are likely to identify some of the risks posed by these organisms. The General Law of Ecological Equilibrium makes all of these possible.

Additionally, the citizen complaint process established in the General Law of Ecological Equilibrium is an innovative mechanism to aid the Secretariat of the Environment in enforcing environmental legislation. It has the potential to contribute to the preservation of biodiversity in cases where pollution and harm to the environment are easily identified by the general population. In the case of LMOs, however, the complaint procedure may not be very helpful since complicated technical analysis and scientific expertise is required to differentiate these organisms from their organic counterparts. Such specialized knowledge and skills are generally beyond the reach of the common citizen. Another federal law relevant to the regulation of LMOs is the Law on Plant Health.

3. *Law on Plant Health*

The Law on Plant Health (LPH)⁹¹ aims preventing, controlling and eradicating plagues and diseases in forests, agricultural areas and wild plants.⁹² Plants constitute an essential part of biodiversity in Mexico. Their protection through this law, contributes to the larger objective of preserving biological diversity, particularly from threats posed by LMOs.

The law approaches plant protection by setting out general phytosanitary requirements and formulating national standards on this matter. Also, the LPH establishes requirements on the import, mobilization and intro-

⁹¹ Ley de Sanidad Vegetal [D.O.] Jan. 05, 1994.

⁹² *Id.* at art. 5.

duction of genetically modified plants into the environment. The law acknowledges the potential threats of biotechnology and states that LMOs have the potential to replicate their traits in other organisms and to produce unexpected results.⁹³

The LPH, supervised by the Secretariat of Agriculture, utilizes national phytosanitary standard NOM-056-FITO-1995⁹⁴ to regulate the national mobilization, import and introduction of LMOs into the environment. Four essential aspects of the LPH can be distinguished: 1) a National Phytosanitary Council, 2) phytosanitary regulations, 3) phytosanitary standard NOM-056-1995 and, 4) enforcement measures.

A. National Phytosanitary Council

The National Phytosanitary Council (NAPC) comprises groups of experts on science and agronomy from academia, the government and different sectors of Mexican society.⁹⁵ It is assigned the task of providing expert advice on matters covered by the LPH. The Council also organizes national campaigns to eliminate plagues and participates in training agriculture producers on how to provide adequate diagnosis to ensure the health of plants.⁹⁶

Although the Council lacks normative authority, it can propose standards to the Secretariat of Agriculture regarding plant protection and the elimination of plagues. If such proposals are accepted by this Secretariat, they can become national phytosanitary standards. The work of the Council is necessary for implementing the LPH and preserving biological diversity from devastation by plagues and the unintended effects of LMOs.

B. Phytosanitary Regulations

The LPH depends on NOMs for its application. Such standards are established by the Secretariat of Agriculture and considered obligatory in Mexico. The law establishes a phytosanitary certificate requirement mechanism and quarantine measures as tools to ensure plant health within Mexican territory. Due to the importance of NOMs as national standards, LPH requires that they must be strictly based on science and on cost-effective risk assessments. Also the standards must emulate international guidelines.⁹⁷

⁹³ *Id.*

⁹⁴ SAGARPA, NOM-056-FITO-1995, available at: http://www.cibiogem.gob.mx/normatividad/normatividad_SAGARPA/NOM-056-FITO-1995.html (last visited: January 12, 2007).

⁹⁵ Ley de Sanidad Vegetal [D.O.] Jan. 05, 1994 at arts. 16-18.

⁹⁶ *Id.*

⁹⁷ *Id.* at art. 20.

Specifically, the LPH states that official standards must contain guidelines through which to diagnose and identify plagues in plants.⁹⁸ They must also establish the phytosanitary requirements plants must meet for their import, transportation and introduction into the environment. In addition to regulating their compliance with NOMs, the LPH requires a phytosanitary certificate to ensure compliance with the Secretariat of Agriculture's sanitary regulations. This certificate requirement regulates the import, mobilization and introduction of LMOs into the environment.⁹⁹

The LPH contemplates sanitary measures, such as national campaigns to locate possible sites of infestation. These campaigns also aim to identify plagues and to elaborate cost-effective studies on their potential damage on plants.¹⁰⁰ Quarantines may also be ordered by the Secretariat of Agriculture as a means to control infestation and to preserve plant health.¹⁰¹

In practice, the LPH is supported for purposes of implementation by the Phytosanitary Standard NOM-056-1995.

C. *The Phytosanitary Standard NOM-056-1995*

By way of a definition, Mexican Official Norms are, under the Federal Law of Metrology and Standardization, defined as: "Obligatory technical regulations enacted by the competent Secretariats establishing rules, specifications, attributes, characteristics of a product or process, activity, service or labeling".¹⁰²

The Federal Law of Metrology and Standardization is implemented by the Secretariat of Economy (SE), which relies on the National Standardization Commission to create NOMs. The Commission hosts several consultative committees on different topics including the environment. On matters regarding the environment, it is the National Consultative Committee of Standardization and the Environment and Natural Resources (COMARNAT) which considers the creation of the appropriate norms. Like other national commissions, the COMARNAT includes in its membership representatives of the public, experts and personnel of the pertinent Secretariats.¹⁰³

⁹⁸ *Id.* at art. 19.

⁹⁹ *Id.*

¹⁰⁰ *Id.* at arts. 31-37.

¹⁰¹ *Id.* at art. 36.

¹⁰² Ley Federal Sobre Metrología y Normalización [L.F.S.M.N.] [Federal Law of Metrology and Standardization] as amended on July 28, 2006, Diario Oficial de la Federación [D.O.], July 1, 1992 at art. 3 (XI), available at [http://www.diputados.gob.mx/LeyesBiblio/doc/130.docart.3 \(XI\)](http://www.diputados.gob.mx/LeyesBiblio/doc/130.docart.3 (XI) (last visited: January 12, 2007).) (last visited: January 12, 2007).

¹⁰³ *Id.* at arts. 43-44.

Generally, competent Secretariats propose the creation of Official Mexican Standards to their respective National Consultative Committee. After deliberation, these proposals come before the Secretariat of Economy for enactment. Proposals that may have economic or substantial impact on a sector of society must include an economic analysis of the projects to be authorized, alternatives to such projects and a comparative study of relevant and applicable international standards.¹⁰⁴ As pointed out by some, the process of NOM enactment could take up to 230 days.¹⁰⁵ It is important to note that issues have been raised by academics regarding the effectiveness of these standards and their constitutionality in the Mexican legal system.¹⁰⁶

It is under the complicated procedure described above that Official Mexican Standard NOM-056-1995 emerges. This national standard establishes the obligatory guidelines on the introduction of experimental LMOs into the environment and importing them into the country. This standard also requires a phytosanitary certificate for the introduction of these organisms into the environment.¹⁰⁷ Experimental introduction of LMOs into the environment is overseen by the Secretariat of Agriculture's National Committee on Agricultural Biosafety and the General Office for Plant Health, which are empowered by the LPH to grant phytosanitary certificates for introducing LMOs into the environment.¹⁰⁸

A request for a phytosanitary certificate must contain technical information on the genetic composition and properties of the LMOs intended to be introduced into the environment. If the phytosanitary certificate is granted by these two institutions, the decision must be communicated to state governments where trials will take place.¹⁰⁹ A similar authorization is required to transport LMOs across the territory of the different Mexican states.¹¹⁰

Importing LMOs or transgenic material is also regulated in this official standard by means of a phytosanitary requirement mechanism.¹¹¹ This certificate may be granted by the Office for Phytosanitary and Zoosanitary Inspection (DGIF). It is important to note that to obtain this certificate required for experimentation with LMOs, it is required to also obtain an international phytosanitary certificate from the country where the LMOs originated.¹¹²

¹⁰⁴ *Id.* at art. 45.

¹⁰⁵ Carla Huerta, *Las Normas Oficiales Mexicanas en el Ordenamiento Jurídico Mexicano*, 92 BOLETÍN MEXICANO DE DERECHO COMPARADO 1-3 (1988).

¹⁰⁶ *Id.*

¹⁰⁷ SAGARPA, Phytosanitary Norm NOM-056-FITO-1995, *supra* note 94, art. 3.

¹⁰⁸ *Id.*

¹⁰⁹ *Id.*

¹¹⁰ *Id.*

¹¹¹ *Id.*

¹¹² *Id.*

D. *Enforcement Measures*

On-site inspector visits, a public complaint process and administrative sanctions are employed to achieve compliance with LPH obligations.¹¹³ The Secretariat of Agriculture must conduct on-site visits to places where vegetal material is stored and produced.¹¹⁴ It must also provide incentives by means of a National Award of Plant Health awarded to outstanding efforts in contributing to the prevention, control and eradication of plagues.¹¹⁵

The Secretariat of Agriculture uses a public complaints procedure to enforce LPH provisions.¹¹⁶ This procedure allows individuals in any region nationwide to denounce acts and omissions that endanger plant health. Finally, the LPH employs administrative sanctions against those who do not obtain phytosanitary certificates or who disregard the conditions established in such certificates. The fines established in the LPH can reach up to 7,000 USD.¹¹⁷

Altogether, the LPH is meant to play an important role in preserving biological diversity in Mexico by preventing, controlling and eradicating plant diseases and plagues and LMOs in experimental introduction. Furthermore, the purpose of the NAPC is to supply expert advice to the Secretariat of Agriculture to thus enhance its prospects. Phytosanitary norm NOM-056-FITO-1995 is aimed at curtailing the introduction of LMOs into the environment and their import by means of a certificate requirement. Such a requirement, if fully implemented, has the potential to control possible threats posed by LMOs.

Despite the potential contributions of this law to biosafety in Mexico, its role in regulating LMOs is limited in scope, particularly in that it focuses on LMO experimental trials, excluding commercial crops and transgenic commodities that could be introduced into the environment and thus affect plant health. It also pays little attention to LMOs past the experimental stage, limiting the scope of this law. Also, the implementation of this law is deficient to the extent that it depends heavily on inspector visits to ensure compliance. The problem here is that given Mexico's economic situation, there are few trained personnel for such inspections. Besides, their inspections tasks are not regularly or adequately funded. With this scenario, the LPH actually affords limited protection to Mexico's biological diversity.

¹¹³ Ley de Sanidad Vegetal [D.O.] Jan. 05, 1994 at 54-58.

¹¹⁴ *Id.* at arts. 54-60.

¹¹⁵ *Id.* at art. 61.

¹¹⁶ *Id.* at arts. 63-64.

¹¹⁷ *Id.* at art. 66.

4. *Law on the Production, Certification and Commerce of Seeds*

The Law on the Production, Certification and Commerce of Seeds (LPCCS)¹¹⁸ was enacted in 1991 under the 1989-1994 National Development Plan.¹¹⁹ At that time, Mexico was undergoing a severe economic crisis and increasing agricultural production was a national priority to guarantee self-sufficiency with regard to food supplies.¹²⁰ The Mexican government advocated the use of “improved seeds” to achieve an increase in food production. These seeds were the result of genetic engineering.¹²¹ This law underwent substantial reforms in 1996 to allow experiments and research on transgenic material to obtain new varieties of plants to overcome droughts, soil infertility and salinity.¹²²

The LPCCS is enforced by the Secretariat of Agriculture and regulates government research for the production of improved seeds and the certification of these seeds.¹²³ The Secretariat of Agriculture is empowered to establish guidelines regarding the use and handling of transgenic material.¹²⁴ The major focus of the LPCCS is to regulate experimentation with transgenic seeds.¹²⁵

Experimentation with Transgenic Seeds

The LPCCS requires a permit for conducting experimentation with high risk transgenic material.¹²⁶ The Secretariat of Agriculture establishes guidelines to assess the risks posed by transgenic materials by means of scientific tests.¹²⁷ Likewise, the LPCCS establishes a review procedure for decisions on considering certain transgenic material high risk and Secretariat of Agriculture decisions that affect individuals.¹²⁸ This review must be performed by the Secretariat of Agriculture’s Legal Director within 15 days of receiving the complaint.¹²⁹ Transgenic material and seeds not considered as posing high risk by the Secretariat of Agriculture are allowed to be planted and

¹¹⁸ Ley Federal de Producción, Certificación y Comercio de Semillas [D.O.] July 15, 1991.

¹¹⁹ Mexican Senate, Legislative Bill on the Production, Certification and Commerce of Seeds, Agriculture and Hydraulic Commission, July 1, 1991 at 3.

¹²⁰ *Id.*

¹²¹ *Id.* at 4.

¹²² *Id.*

¹²³ *Id.*

¹²⁴ Ley Federal de Producción, Certificación y Comercio de Semillas [D.O.] July 15, 1991 at arts. 1-2.

¹²⁵ *Id.*

¹²⁶ *Id.*

¹²⁷ *Id.*

¹²⁸ *Id.* at arts. 34-38.

¹²⁹ *Id.*

introduced into the environment experimentally.¹³⁰ No monitoring mechanisms are provided under this law or federal regulations on transgenic seeds and material deemed “low risk”.

Another means of ensuring biosafety in Mexico is the certification of seeds before they are commercialized and introduced into the environment. Certification is performed by the Secretariat of Agriculture in accordance with its technical guidelines. Only seeds that have been approved and certified by the Secretariat of Agriculture are allowed to be introduced into the environment and commercialized.¹³¹ In addition to approval, seeds must be labeled with information on their characteristics, the chemical disinfection treatment they underwent when appropriate and the percentage of content of material from other varieties.¹³²

The LPCCS centers on a National Consultative Committee on Plant Varieties which is comprised of representatives of the sectors involved in seed commercialization. This Committee verifies information on the properties of seeds and serves as a conflict-solving agency for conflicts involving seeds.¹³³ The LPCCS also imposes pecuniary sanctions on those who commercialize or plant seeds that have not met the legal standards or who certify seeds in contravention of the legal provisions.¹³⁴

Overall, the LPCCS emerged in a time of economic crisis. It resembles, more than a law to preserve the environment, an economic instrument to allow experimentation with transgenic material. It opened the door for using biotechnology in Mexico without the supporting biosafety regulations required for such a purpose. Similar to the Law on Plant Health, it offers a limited approach to LMO regulation.

The LPCCS does not include coordination mechanisms among the various environmental institutions and ignores important issues such as a concern for Mexico’s native plants and the areas where they exist. As an economic growth instrument, it requires enormous financial backing to monitor seed certification and to ensure compliance with provisions.

Also, the LPCCS lacks the support of environmental institutions and biosafety legislation not yet created in Mexico at the time.

5. *The 2005 Biosafety Law on GMOs*

As discussed in sections II.2-II.4 above, Mexican legislation only recently addressed how to counter the potential threats of LMOs arising from experimentation with transgenic seeds. In spite of the presence of the pieces of

¹³⁰ *Id.* at arts. 1-2.

¹³¹ *Id.* at arts. 8-11.

¹³² *Id.*

¹³³ *Id.* at art. 13.

¹³⁴ *Id.* at arts. 15-20.

legislation described in previous sections, the control of LMOs is still a problem, as evidenced in the CEC's Maize Case.¹³⁵ The Mexican Congress also noted that the scope of the provisions in the various laws did not offer "certainty" to national and foreign investments in the biotechnology sector.

Prior to the enactment of the Biosafety Law on GMOs in 2002, the Mexican Congress created Committees for Science and Technology and Environment, Natural Resources and Fisheries to conduct comprehensive studies on how to balance Mexico's wealth of biological resources against its international obligations to promote free trade. These committees strove to unify the biosafety provisions scattered throughout Mexican legislation, keeping in mind the potential contribution of LMOs to meet such pressing challenges as hunger, and general economic underdevelopment, while benefiting the Mexican economy.¹³⁶ They acknowledged that there was a close relationship between biotechnology and biosafety and that biotechnology offers innumerable benefits to agriculture and human health, plant and animal health, and the improvement of contaminated soil through bioremediation.¹³⁷ They also noted that biotechnology could provide a venue for Mexico to develop economically.¹³⁸

Furthermore, Congress considered the legislative initiatives by Mexico's political parties, namely, the Green Ecological Party of Mexico (Green Party), the National Action Party (PAN) and the Institutional Revolutionary Party (PRI).¹³⁹ The Green Party's initiative advocated monitoring the introduction of LMOs into the environment and the creation of Official Mexican Standards to regulate confined use of LMOs.¹⁴⁰

The PAN's initiative proposed a strict risk assessment to obtain permits for the introduction of LMOs into the environment and that the proponent of introducing LMOs could develop contingent measures for emergency

¹³⁵ CEC, MAIZE AND BIODIVERSITY: THE EFFECTS OF TRANSGENIC MAIZE IN MEXICO: KEY FINDINGS AND RECOMMENDATIONS (Commission for Environmental Cooperation 2004), available at: <http://www.cec.org/maize> (last visited: May 2, 2007). The Maize Report focused on examining the potential problems related to direct and indirect gene flow from transgenic varieties of maize and on the conservation of maize biodiversity near its center of origin. Several discussion papers were written, chapters were submitted to a peer review process, symposiums were organized and public participation took place. Report findings were meant to aid the Commission for Environmental Cooperation's (CEC) Secretariat to enable it to provide recommendations to the three NAFTA parties. The Maize Report evidenced some deficiencies in Mexico's legislation, environmental policy and institutions.

¹³⁶ Mexican Senate, Legislative Initiative of the Biosafety Law on GMOs, Legislative Commissions of Science and Technology and Environment, Natural Resources and Fisheries, November 12, 2002, at 1-2.

¹³⁷ *Id.* at 4.

¹³⁸ *Id.*

¹³⁹ *Id.* at 11.

¹⁴⁰ *Id.*

situations involving LMOs.¹⁴¹ The PRI also proposed several measures for the preservation of human and animal health and that LMOs were not to be introduced into protected areas.¹⁴² Following the report of the Legislative Committee and taking into account various parts of each of the political parties' proposed initiatives, a "unified" legislative proposal was contemplated by the Mexican Congress in 2003,¹⁴³ which resulted in the 2005 Biosafety Law on GMOs.¹⁴⁴

The enactment of the 2005 Biosafety Law on GMOs was propelled by Mexico's ratification of the Cartagena Protocol in April 2002.¹⁴⁵ This law is seen as the ideal tool to address Mexico's lack of a legislative and institutional biosafety framework needed to meet the obligations imposed by the Cartagena Protocol. The law attempts to unify biosafety provisions in various pieces of legislation such as those in the General Law of Ecological Equilibrium, the Law on Plant Health and the Law on the Production, Certification and Commerce of Seeds. Furthermore, this law strives to strengthen Mexico's environmental institutions, such as the Inter-Secretarial Commission on GMOs and the National Biodiversity Commission and to coordinate their efforts in biosafety regulation.¹⁴⁶ The Biosafety Law affords Mexico a basis for implementing the CBD and the Cartagena Protocol.¹⁴⁷

A. Objectives

The Biosafety Law on GMOs establishes the foundation of biosafety regulations in Mexico and the institutional structure needed for this purpose. This law is implemented by the Secretariat of Agriculture and the Secretariat of the Environment.¹⁴⁸ The objective of the Biosafety Law on GMOs is to regulate the production, introduction and commerce of "GMOs".¹⁴⁹ Such a regulatory approach comprehensively regulates the confined use, experimental introduction, imports and exports of these organisms.¹⁵⁰ Furthermore, the law seeks to prevent, avoid and minimize potential adverse effects of GMOs not only on biological diversity, but also on human health

¹⁴¹ *Id.*

¹⁴² *Id.*

¹⁴³ The 2003 legislative proposal to enact a Biosafety Law on GMOs is almost identical to the current 2005 Biosafety Law on GMOs.

¹⁴⁴ *Id.* at 1-2.

¹⁴⁵ *Id.*

¹⁴⁶ *Id.* See Annex.

¹⁴⁷ *Id.*

¹⁴⁸ *Id.* at art. 2 (3).

¹⁴⁹ The Biosafety Law on GMOs uses the terms LMO and GMOs as synonyms. See Ley de Bioseguridad de Organismos Genéticamente Modificados [D.O.] March 18, 2005 at art. 3 (XXI).

¹⁵⁰ *Id.* at art. 1.

and the environment in general. In addition, it seeks to protect animal and plant health.¹⁵¹

The Biosafety Law on GMOs serves as a framework for the implementation of the Cartagena Protocol. It strives to define Mexico's policy on LMOs and coordinates interaction among Mexico's environmental institutions, the federal government and Mexican states.¹⁵² It also aims at setting out the administrative and permit procedures for introducing LMOs into the environment.¹⁵³

As to the areas in which LMOs could be released, the Biosafety Law on GMOs may "determine on a case by case basis the establishment of areas in which activities with these organisms will be restricted including those in which Mexican plants originate". It also affords a special protection regime to those areas in which native varieties of maize originate.¹⁵⁴ Furthermore, it establishes the basis for the creation of Official Mexican Standards on biosafety.¹⁵⁵ The Biosafety Law also seeks to unify and coordinate "scattered" biosafety legislation and rely on a precautionary approach in cases of scientific uncertainty.¹⁵⁶

The objectives set out in this legislation are quite ambitious. It covers the control and regulation of all activities in the country that deal with various aspects of biosafety and biotechnology. In practice, it sets out broader objectives than those employed by the Cartagena Protocol since it addresses issues of labeling, pharmaceuticals and consumption of transgenic commodities.¹⁵⁷ One example of the overbreadth of this law is the use of the term "Genetically Modified Organisms" to encompass LMO/GMOs under the same concept.¹⁵⁸ It also includes titanic commitments, such as generating Official Mexican Standards or national obligatory standards to define the functions of environmental institutions and establish LMO-free zones.¹⁵⁹

The comprehensiveness of the Biosafety Law on GMOs may prevent it from being fully implemented. On the other hand, any effort at implementation would be a difficult endeavor and would require huge financial resources. Its broad scope also holds the potential to create conflicts regarding the jurisdiction of environmental institutions under its purview.

¹⁵¹ *Id.* at art. 2.

¹⁵² *Id.*

¹⁵³ *Id.*

¹⁵⁴ *Id.*

¹⁵⁵ *Id.*

¹⁵⁶ *Id.* at art. 9 (IV).

¹⁵⁷ *Id.* at arts. 4-8.

¹⁵⁸ The Biosafety Law on GMOs defines Genetically Modified Organisms as living organisms that possess novel genetic combination resulting from biotechnology. *Id.* at art. 3 XXI.

¹⁵⁹ *Id.* at arts. 2 (XI), 90.

B. Powers of Environmental Institutions

Two institutions play fundamental roles in ensuring biosafety and regulating the introduction of LMOs into the Mexican environment: the Secretariat of Agriculture and the Secretariat of the Environment. The Biosafety Law on GMOs assigns shared responsibility and creates checks and balances between these two institutions.¹⁶⁰ The Secretariat of Agriculture, for instance, can authorize the introduction of LMOs into the environment after taking into account a resolution passed by the Secretariat of the Environment on the safety of such organisms and their potential impact on biological diversity.¹⁶¹ Likewise, the Secretariat of the Environment has the power to authorize LMOs in forests and for bioremediation purposes, but it must take into account a Secretariat of Agriculture resolution on the safety of these organisms.¹⁶² This shared authorization process is meant to guarantee transparency and impartiality in decisions on the introduction of these organisms into the environment.

The Secretariat of Agriculture formulates national policy on LMOs in agriculture and is in charge of monitoring their introduction into the environment. Additionally, this Secretariat is empowered by the biosafety law to suspend or revoke permits for introducing these organisms into the environment.¹⁶³ Similarly, on matters of LMOs in forests and on bioremediation, the Secretariat of the Environment is also able to establish a national biosafety policy and evaluate the risks associated with LMOs in forests and for bioremediation purposes on a case-by-case basis.¹⁶⁴ The two Secretariats are responsible for monitoring LMOs within their areas of competence and implementing the required measures to restore biological diversity countrywide.¹⁶⁵ In cases of accidental introduction of LMOs, the Biosafety Law on GMOs provides coordination mechanisms among all the federal Secretariats so that they can take the necessary measures to address contingency situations nationwide in their respective areas.¹⁶⁶

An innovative institution created under the Biosafety Law on GMOs is the Inter-Secretarial Commission on GMOs.¹⁶⁷ This institution is comprised of a President-appointed representative and one representative from each of the following institutions: the Secretariat of the Environment, Agricul-

¹⁶⁰ *Id.* at arts. 10-13.

¹⁶¹ *Id.* at art. 15.

¹⁶² *Id.* at art. 14.

¹⁶³ *Id.* at art. 38.

¹⁶⁴ *Id.* at art. 11.

¹⁶⁵ *Id.*

¹⁶⁶ *Id.* at art. 17.

¹⁶⁷ *Id.* at arts. 19-24.

ture, Economy (SE), and the National Council of Science and Technology (CONACYT).¹⁶⁸ By law, this institution functions as an advisory body on matters regarding the scientific and technical aspects of biotechnology and biosafety.¹⁶⁹ In addition, the Inter-Secretarial Commission on GMOs coordinates efforts among Mexican institutions in matters related to LMOs.¹⁷⁰

As noted, the distribution of powers under the Biosafety Law of GMOs strives to guarantee transparency and impartiality in decisions to introduce LMOs into the environment. By placing the responsibility on the Secretariat of the Environment and the Secretariat of Agriculture to ensure this balance, the law embraces its potential to benefit biological diversity because scientists and experts from both institutions are thereby obligated to carefully consider the risks of LMOs and agree on what must be done in each case. The law also ensures that efforts to secure biodiversity on a national level can be coordinated by the Inter-Secretarial Commission on GMOs.

While this system has a great potential, it can also create conflicts and other difficulties among the governmental institutions involved in deciding on the introduction of LMOs into the environment. For example, if federal regulations and Official Mexican Standards do not define the powers of the institutions involved in detail, potential conflicts can arise affecting decision-making and thus biodiversity.

C. Permit Procedure to Authorize the Introduction of LMOs into the Environment

The Biosafety Law on GMOs distinguishes three types of authorization for introducing LMOs into the environment: experimental; pilot and commercial.¹⁷¹ It is important to note that these procedures are distinctive. In general, authorization from the Secretariat of Agriculture or the Secretariat of the Environment begins with a request from a proponent that is immediately recorded in the National Registry of Biosafety and GMOs of the Inter-Secretarial Commission on GMOs.¹⁷² Such a request must include the characteristics of the LMO to be released into the environment based on guidelines and specifications contained in NOMs.¹⁷³ In addition, the request must include information on the location where these releases are planned to take place.¹⁷⁴

The Biosafety Law on GMOs establishes also that LMOs not allowed to be released in their country of origin will not be allowed in Mexico.¹⁷⁵ It

¹⁶⁸ *Id.*

¹⁶⁹ *Id.* at art. 20.

¹⁷⁰ *Id.* at arts. 19-24.

¹⁷¹ *Id.* at art. 32.

¹⁷² *Id.* at art. 109.

¹⁷³ *Id.* at art. 50 (V).

¹⁷⁴ *Id.*

¹⁷⁵ *Id.* at art. 40.

also provides that requests to introduce LMOs into the environment must be accompanied by impact and risk assessment studies conducted by the proponent that address the potential impact of these organisms on biological diversity and on plant and animal health.¹⁷⁶ The request must also include monitoring mechanisms and contingency measures to preserve biodiversity from an unintended release of these organisms.¹⁷⁷ A decision made by the Secretariat of the Environment or the Secretariat of Agriculture is based on an analysis of the scientific studies conducted by the proponent and additional scientific considerations of the potential effects of the proposed LMOs on the environment.¹⁷⁸

As a framework, the Biosafety Law relies on NOMs to establish specific biosafety regulations. At the stage of introducing LMOs into the environment, NOMs are particularly important. These NOMs, according to the Biosafety Law, must establish:

- 1) The requirements for authorizing general releases of LMOs.¹⁷⁹
- 2) The information required to identify LMOs to be introduced into the environment.¹⁸⁰
- 3) Information that must be taken into account for LMO releases regarding the risks of these organisms.¹⁸¹
- 4) The information on what the pilot LMO release will contain.¹⁸²
- 5) The requirements for commercial release of LMOs.¹⁸³

As a final stage in the authorization process, the Biosafety Law calls for the incorporation of public opinion and recommendations into the authorization to release LMOs into the environment.¹⁸⁴ The public participation procedure must take place 20 business days following the submission of the request to introduce LMOs into the environment.¹⁸⁵ The law provides that accepted public opinion must be technically and scientifically based.¹⁸⁶ At the end of this process, the Secretariat of the Environment and the Secretariat of Agriculture issue a technical authorization document. LMOs that can be introduced in their country of origin undergo the above procedures

¹⁷⁶ *Id.* at arts. 32-41.

¹⁷⁷ *Id.*

¹⁷⁸ *Id.*

¹⁷⁹ *Id.* at art. 34.

¹⁸⁰ *Id.* at art. 42 (I).

¹⁸¹ *Id.* at art. 42 (VII).

¹⁸² *Id.* at art. 50 (V).

¹⁸³ *Id.* at art. 55 (VII).

¹⁸⁴ *Id.* at art.33.

¹⁸⁵ *Id.*

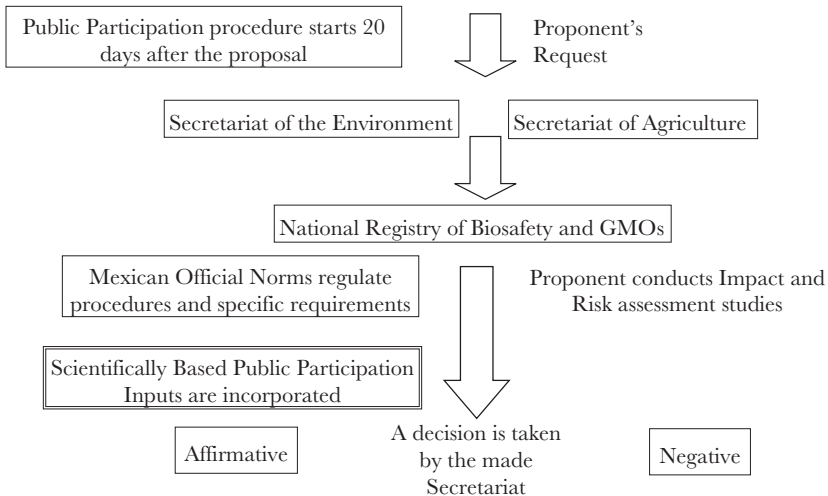
¹⁸⁶ *Id.*

to assess the possibility of their being introduced in Mexico. The law gives Official Mexican Standards a central role in authorizing LMO imports and their release into the environment.

As discussed in Section II.3.A, the process for elaborating Official Mexican Standards can be lengthy due to the various institutions that participate in their creation and the potential economic impact they can have on sectors of the population. As to the Biosafety Law on GMOs, it must be pointed out that at present NOMs or any federal regulations to assist in biosafety regulation and the implementation and support of the Biosafety Law have yet to be developed. As it is, the Biosafety Law stands on its own with general guidelines to regulate a growing activity that makes up more than 1 percent of Mexican crop production.¹⁸⁷

In addition to the lack of NOMs, the public participation process also limits the number of individuals who can participate by requiring that opinions be technically and scientifically based.¹⁸⁸ This means that the views of traditional farmers and plant breeders who have played a role in preserving biological diversity for generations, but are not scientifically and/or technically knowledgeable, are excluded.

*Figure 1. Permit Procedure for the Introduction of LMOs in Mexico
(Biosafety Law on GMOs Arts. 33-41)*



¹⁸⁷ ISAAA, Global Status of Commercialized Biotech/GM Crops in 2005, available at: <http://www.isaaa.org/kc/bin/briefs34/pk/index.htm> (last visited: January 11, 2007).

¹⁸⁸ Ley de Bioseguridad de Organismos Genéticamente Modificados [D.O.] March 18, 2005 at art. 3 (XXI).

D. LMOs for Food, Feed and Processing

Unlike the Cartagena Protocol, the Biosafety Law on GMOs extensively regulates LMO-FFPs and includes them within its main scope because of the potential they have to harm human health. The Mexican Secretariat of Health (SSA) plays a central role in regulating LMO-FFPs. It regulates commodities for human consumption, including grains, those for processing food for human consumption, those that have an impact on public health and those for bioremediation purposes.¹⁸⁹ In those cases, the Secretariat of Health requires a permit from the proponent.

The permit procedure starts with a proponent's request which includes a risk assessment and scientific information on the products and the potential effects on humans upon consuming them.¹⁹⁰ The assessment required to commercialize and distribute LMOs-FFPs follows the general requirements for agricultural products in the Biosafety Law on GMOs.¹⁹¹ The Biosafety Law on GMOs also provides that further requirements for authorizing LMO-FFPs are found in Official Mexican Standards.¹⁹² In deciding on the authorization of these commodities, the Secretariat of Health can also request technical opinions from the Secretariat of the Environment or the Secretariat of Agriculture.

Altogether, the Biosafety Law on GMOs goes beyond the Cartagena Protocol by regulating LMOs-FFPs and their potential impacts on human health. This law empowers the Secretariat of Health to authorize importing and consuming LMO-FFPs in Mexico. The procedure to authorize LMO-FFPs is limited in that it focuses exclusively on their effects on human health. A more comprehensive approach could be taken by the Biosafety Law by addressing the potential effects of these commodities on the environment in the risk assessment if they are introduced. Following the CEC's Maize Report, however, the Secretariat of Agriculture and the Secretariat of the Environment launched national campaigns to warn and educate traditional farmers on the potential dangers of introducing these organisms into the environment. Several questions remain unanswered regarding the capabilities of these two environmental agencies to reach indigenous farm-

¹⁸⁹ *Id.* at art. 91. Bioremediation is defined by the National Safety Council as "The use of living organisms to clean up oil spills or remove other pollutants from soil, water, and wastewater, use of organisms such as non-harmful insects to remove agricultural pests or counteract diseases of trees, plants, and garden soil". See NATIONAL SAFETY COUNCIL, ENVIRONMENTAL HEALTH CENTER GLOSSARY, available at: <http://www.nsc.org/ehc/glossary.htm#b> (last visited: January 12, 2007).

¹⁹⁰ Ley de Bioseguridad de Organismos Genéticamente Modificados [D.O.] March 18, 2005 at art. 92.

¹⁹¹ *Id.* at arts. 60-63.

¹⁹² *Id.*

ers in remote areas and the availability of resources for such national campaigns.

E. *The Precautionary Principle*

The precautionary principle was enunciated in article 8 of the Biosafety Law on GMOs as an obligation of the Mexican government to:

Protect the environment and biological diversity, by applying the precautionary approach according to its capabilities, taking into account commitments established in international treaties and agreement of which the United Mexican States is a member. When there is danger of substantial or irreversible harm, lack of absolute scientific certainty shall not be used as justification to postpone the application of cost effective measures to prevent environmental and biodiversity degradation. Such measures shall be applied according to the provisions and administrative procedures established in this law.¹⁹³

This principle is also mentioned at the risk assessment stage. The Biosafety Law on GMOs provides that the Secretariats of Health, Agriculture and the Environment must follow the precautionary approach for the protection of biodiversity and human health. On this matter, article 63 states:

In case of danger of substantial and irreversible harm, uncertainty from the level of risks that GMOs can cause to biological diversity or to human health should not be used as justification for the competent Secretariat to postpone effective measures that prevent negative effects on biological diversity or human health.¹⁹⁴

Although this Law does not define how this principle should be applied, it provides that the precautionary principle should be applied taking into account precautionary measures and Mexico's obligations contained in international trade agreements. Article 63, regarding the precautionary principle provides: "In adopting such measures, the relevant Secretariat shall take into account existing scientific evidence to be employed as criteria to establish such measures; administrative procedures in this law and trade legislation contained in international treaties and agreement of which Mexico is a party".¹⁹⁵

Further precautionary provisions in this law are embedded in the establishment of protected areas, LMO-free zones and areas of origin.¹⁹⁶

¹⁹³ *Id.* at art. 8.

¹⁹⁴ *Id.* at art. 63.

¹⁹⁵ *Id.*

¹⁹⁶ *Id.* at arts. 86-87.

The Biosafety Law casts the application of this principle in light of Mexico's "international commitments". If the principle is applied according to the commitments in the Biodiversity Convention or the Cartagena Protocol, to which Mexico is a party, the interpretation of this principle and its application would be more environmentally oriented. The interpretation would anticipate potential harm and take into account uncertainty so as to take the necessary precautions. On the other hand, if Mexico interprets precaution in light of its commitments under international trade agreements, this principle would be primarily scientifically based and fully rely on risk assessments and scientific evidence, if available. This "trade" interpretation would perhaps not provide comprehensive protection because science is not fully developed (Mexico lacks the technology and infrastructure to monitor an activity once it is permitted) and because Mexico is one of the richest territories in biodiversity and the native home of many plants.

The inclusion of the precautionary principle in the Biosafety Law on GMOs is, therefore, only a "good intention" or a "promise". Although the first enunciation of the principle in Mexican legislation is normatively weak, it could also be the beginning of an effective balance between the demands of capitalism and environmental awareness in Mexico.¹⁹⁷

F. *Impact and Risk Assessment*

The Biosafety Law's EIA and risk assessment procedures are safeguards to ensure biosafety in activities involving the release of LMOs.¹⁹⁸ The studies are conducted by the proponent of an activity, on a case-by-case basis, and must be based on scientific expert opinions and a precautionary approach.¹⁹⁹ It is important to note that like the General Law of Ecological Equilibrium, the Biosafety Law on GMOs does not contain provisions for the use of Strategic Environmental Assessments in LMO policies or regulations.

Impact and risk assessment procedures in the Biosafety Law follow a threefold process: the initial stage of identifying the LMO and its characteristics; identifying possible impact on biological diversity; and evaluating these risks along with the probability of their occurrence.²⁰⁰ A recommendation follows these procedures as to whether the risks associated with this activity are acceptable and manageable.²⁰¹

Although this Law does not establish further procedures for evaluating the assessments performed by the proponent, the Secretariat of the Envi-

¹⁹⁷ *Id.*

¹⁹⁸ *Id.* at arts. 42-60.

¹⁹⁹ *Id.*

²⁰⁰ *Id.*

²⁰¹ *Id.*

ronment and the Secretariat of Agriculture routinely request technical opinions from the National Biodiversity Commission and the National Institute of Ecology. The technical opinions produced by these two institutions are non-binding and are further evaluated by the two Secretariats before a decision is made.²⁰² In terms of the EIA, the Biosafety Law on GMOs provides that the characteristics and requirements for evaluating this assessment are to be established in NOMs.²⁰³ To date, these NOMs have not been developed, either under the Biosafety Law on GMO or the General Law of Ecological Equilibrium.

In cases of uncertainty or lack of scientific evidence on the potential effects of LMOs on biodiversity or animal and plant health, this Law provides that Mexican authorities can request additional information from the proponent based on the findings in the impact and risk assessments.²⁰⁴ Authorities can also adopt additional monitoring measures to scrutinize the potential interaction of LMOs with organic species at the location of the releases.²⁰⁵ In cases where substantial or irreversible harm may occur as a result of the release of the LMOs into the environment, the law states that “nothing will preclude the competent Secretariats from taking the necessary measures to prevent substantial or irreversible harm to biodiversity, taking into account the available scientific evidence and Mexico’s international trade obligations”.²⁰⁶ It also provides that the procedures and guidelines required for carrying out impact and risk assessment studies would be set out in national standards or official norms.²⁰⁷

The procedures, which are to be examined by the Secretariat of the Environment or the Secretariat of Agriculture, acknowledge the difficulties in assessing the risks of organisms in situations of uncertainty or lack of scientific evidence. Though it mentions the precautionary approach, the law does not provide guidelines for its application to balance this uncertainty. Thus, it limits the decision-maker’s ability to apply the principle, for instance, as it may impact Mexico’s international trade obligations. In addition, the Law lacks guidelines regarding the characteristics and requirements for EIA. These requirements have not been established in NOMs. Consequently, the lack of guidelines hampers the adequacy of this important assessment procedure and can be subject to abuse by the Secretariats

²⁰² NATIONAL INSTITUTE OF ECOLOGY, INTERNAL REGULATIONS (2003), available at: <http://www.ine.gob.mx/ueajei/rules32.html#art110> at arts.110-112 (last visited: January 12, 2007).

²⁰³ Ley de Bioseguridad de Organismos Genéticamente Modificados [D.O.] March 18, 2005 at art. 65.

²⁰⁴ *Id.* at art. 63.

²⁰⁵ *Id.*

²⁰⁶ *Id.*

²⁰⁷ *Id.*

in light of financial interests that may arise by applications to introduce LMOs through trade.

G. *Restrictions on Introducing LMOs*

The Biosafety Law on GMOs employs a threefold mechanism to restrict the spread of LMOs. First, it restricts the introduction of LMOs in the “areas of origin”,²⁰⁸ in natural protected areas²⁰⁹ and in zones where organic products are produced.²¹⁰ These restrictions will be analyzed accordingly.

The “areas of origin” regime is established and designated by the Secretariat of the Environment and the Secretariat of Agriculture. In so doing, they must take into account areas where the organic counterparts of the proposed LMOs originated.²¹¹ Areas of origin are those that host species and genetic diversity native to Mexico. The introduction of LMOs is forbidden in such areas due to their importance in preserving ecosystems, habitats and in turn, biological diversity.²¹²

Introduction of LMOs is also restricted in national protected areas. Though they are allowed as part of bioremediation efforts to cleanse and restore polluted areas or to fight pests and disease,²¹³ they are banned from the core zones or designated areas within a protected area where ecosystems are preserved.²¹⁴

The introduction of LMOs is also restricted for organic certification purposes in LMO-free zones. These zones are established to preserve agricultural organic production in communities across the country.²¹⁵ This system of zones will be established in regions where, according to scientific studies, LMOs and their organic counterparts cannot coexist in the same area.²¹⁶ Space establishment in such zones falls under the jurisdiction of the Secretariat of Agriculture, which may request technical opinions from the Inter-

²⁰⁸ *Id.* at arts. 86-88.

²⁰⁹ *Id.* at art. 89.

²¹⁰ *Id.* at art. 90.

²¹¹ *Id.*

²¹² *Id.* at art. 86.

²¹³ *Id.* at art. 89.

²¹⁴ Reglamento de la Ley General del Equilibrio Ecológico y la Protección al Ambiente en Materia de Áreas Naturales Protegidas [R.L.G.E.E.P.A.M.A.N.P.] [Regulations of the General Law of Ecological Equilibrium on National Protected Areas] Diario Oficial de la Federación [D.O.] Nov. 30, 2000, available at: <http://www.conanp.gob.mx/anp/legal/ANP.pdf> (last visited: January 12, 2007). In this law, core zones comprise zones of protection, zones of restricted use, zones of traditional use, zones of sustainable use of natural resources, restoration zones, etc.

²¹⁵ Ley de Bioseguridad de Organismos Genéticamente Modificados [D.O.] March 18, 2005 at art. 90.

²¹⁶ *Id.*

Secretarial Commission on GMOs and the National Biodiversity Commission.

The Secretariat of Agriculture must also take into account provisions established in NOMs on the production of organic products.²¹⁷ To establish an LMO-free zone, a community request, approved by the municipality and the state government must be made. After such a request, the Secretariat of Agriculture will conduct the scientific and technical tests required by the Biosafety Law on GMOs to determine if it can establish an LMO-free zone.²¹⁸

Although the threefold system of restrictions on the introduction of LMOs into these areas has the potential to preserve biological diversity and native species, it presents a series of pitfalls. The system of areas of origin, for example, lacks mechanisms to compel Mexico's environmental institutions to designate them. There is also no indication that these areas have been delineated or that they exist in Mexico. Similarly, national protected areas may provide limited protection to biological diversity since the introduction of LMOs is only banned in the core zones established within these areas.

LMO-free zones may also provide protection to biological diversity and to traditional agriculture since valuable resources may be found within them. The procedure for designating these areas, however, is complicated and politicized since it involves a unanimous decision by the relevant state, municipalities and communities involved. The proponent of these zones may also find it difficult to prove the incompatibility of modified plants with their organic counterparts.

H. *Enforcement Measures in the 2005 Biosafety Law on GMOs*

The Biosafety Law on GMOs comprises information, monitoring and enforcement mechanisms to achieve its goals. This law implements a National System of Information on Biosafety to organize, update and distribute biosafety information throughout the country.²¹⁹ This information system is implemented by the Inter-Secretarial Commission on GMOs, which is also responsible for producing annual reports on the state of national biosafety in Mexico.²²⁰

The Inter-Secretarial Commission on GMOs is responsible for coordinating efforts with the Secretariat and it is the national authority responsible for liaising with the Secretariat of the CBD and the BCH under the

²¹⁷ *Id.*

²¹⁸ *Id.*

²¹⁹ *Id.* at art. 108.

²²⁰ *Id.*

Cartagena Protocol.²²¹ In addition to the information system, the law creates a National Biosafety Registry of GMOs that includes all the information on the introduction and experimentation with GMOs and LMOs nationwide.²²²

The Secretariat of Agriculture and the Secretariat of the Environment oversee the enforcement of this law through inspection and financial fines.²²³ These institutions are also responsible for establishing contingency measures in the case of adverse effects of LMOs on the environment, human health, and animal and plant health.²²⁴ In the event of such adverse circumstances, the Secretariats are obligated to revoke authorizations for the release of LMOs and in the case of substantial harm resulting from the introduction of such organisms, to destroy them or to return them to their country of origin.²²⁵

The law also provides for monetary sanctions to be imposed on those who in the absence of the proper authorization introduce LMOs into the environment, falsify information regarding the effects of these organisms on the environment or infringe legal requirements. The corresponding Secretariat is authorized to impose a fine of up to 60,000 USD for violating this law.²²⁶

The implementation and enforcement of the Biosafety Law on GMOs is left to the institutions that may authorize the introduction of LMOs into the environment, namely, the Secretariat of Agriculture and the Secretariat of the Environment. The Biosafety Law does not allocate a fixed budget for its implementation. These two institutions absorb the costs as they enforce the law through inspections. Inspectors are not only responsible for implementing biosafety regulations nationwide; they also oversee the implementation of general environmental legislation nationwide. The Biosafety Law's potential effectiveness is left, then, to the uncertain availability of inspectors and financial resources.

Altogether, the enactment of the Biosafety Law on GMOs is an important achievement in Mexico. It is a synthesis of the various proposals from Mexico's political parties. As seen from its legislative history, the Mexican Congress fought to preserve biodiversity and create a law that would boost national economic development, particularly by using biotechnology in exploiting genetic resources.

The enactment of this law puts Mexico in a position to regulate activities involving LMO releases into the environment and experiments with these

²²¹ *Id.* See also the Cartagena Protocol at art. 19.

²²² Ley de Bioseguridad de Organismos Genéticamente Modificados [D.O.] March 18, 2005.

²²³ *Id.* at art. 115.

²²⁴ *Id.*

²²⁵ *Id.*

²²⁶ *Id.*

organisms in the country. It also serves as a framework legislation upon which the application of dispersed biosafety regulations can be based. It contributes to the implementation of the Cartagena Protocol by creating the structure upon which the Protocol can be implemented. The Biosafety Law on GMOs, however, has a broader scope than the Protocol by directly regulating LMO-FFPs. However, the Law lacks the supporting NOMs and regulations required to ensure biosafety and to accomplish its ambitious objectives. Without these regulations and national standards, this law is largely powerless and difficult to implement due to the large amount of resources needed and the many institutions involved.

Likewise, guidelines are needed to designate areas of origin. Although it has the potential to preserve native plants, this system is far from being enforced because they have not been designated. A more active role is required from the Secretariat of the Environment and the Secretariat of Agriculture to conduct the necessary studies and identify these areas. Lack of financial resources and specialized inspectors devoted to biosafety also represent hurdles that need to be overcome to ensure biosafety and to implement the obligations established in the Cartagena Protocol through the Biosafety Law on GMOs.

III. CONCLUSION

Mexican legislation prior to the Biosafety Law on GMOs contained diffuse provisions on biosafety. The General Law of Ecological Equilibrium and Environmental Protection, for example, provided a general framework for regulating LMOs under activities that are likely to alter ecological equilibrium.²²⁷ This Law, however, lacked the specialized legislative and institutional structure to effectively address threats posed by LMOs. Similarly, the LPH offered a remedial approach to LMOs by addressing the threats posed by these organisms when they become plagues or pests.²²⁸ Preventive approaches and monitoring tools were missing in this law.

While it was possible to preserve biological diversity, the 1995 NOM FITO-056²²⁹ required numerous personnel to carry out inspections and run seed certification centers. These were not available when this NOM was enacted, as seen later in the CEC's Maize Report.²³⁰ Similarly, the Law on Certification and Commerce of Seeds was an economic development tool used to allow LMO experimentation in Mexico. As seen in the aforementioned biosafety provisions, there was a lack of legislative coordi-

²²⁷ Ley General de Equilibrio Ecológico [D.O.] 28 de enero de 1988 at art. 31.

²²⁸ Ley de Sanidad Vegetal [D.O.] Jan. 05, 1994 at art. 5.

²²⁹ NOM-056-FITO-1995, *supra* note 94.

²³⁰ CEC, *supra* note 135.

nation in regulating LMOs. Also, the relevant disaggregated provisions could not extend the protection needed to include Mexico's biological resources.

The 2005 Biosafety Law on GMOs came to unify and coordinate previous biosafety regulation in Mexico. It offers a more comprehensive approach by regulating experimentation, pilot programs and commercialization of LMOs. But again, this law's potential to bring about effective biodiversity preservation is undermined by the lack of NOMs and regulations necessary for its implementation. In their absence, the Biosafety Law on GMOs remains a general framework that is difficult to implement, and therefore, does not afford substantial protection to biodiversity. It also does not further the objectives of the CBD and the Cartagena Protocol in Mexico's effort to observe these international treaties.

Regarding environmental principles, the Biosafety Law on GMOs lacks guidelines and specific regulations to integrate environmental impact assessment into decision making on the introduction of LMOs into the environment. It also fails to provide tools for balancing scientific uncertainty against trade interests, even though it endorses, for the first time in Mexican legislation, observance of the precautionary principle. The enunciation of the precautionary principle in the Biosafety Law on GMOs, however, is weak because it is subordinate in its application to trade agreements and to cost-effective measures. The implementation of the principle also requires extensive rules and national guidelines that must be followed by environmental institutions. As it is, the principle expresses good intentions, but its practical impact is rather remote at the moment. Under these circumstances, Mexico's legislative framework cannot effectively work for the preservation of biological diversity and for the implementation of international obligations contained in the CBD and the Cartagena Protocol.