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**Environmental Taxation and Fertilizers:
An Alternative to Recover the Quality of Water
Resources in Argentina**

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ABSTRACT

Eutrophication is a process of water deterioration caused by the excessive and uncontrolled enrichment of nutrients, which conditions its use and generates ecological, health, economic, and social impacts. Considering the consequences of eutrophication for Argentina, which are likely to worsen with COVID-19; that one of its main causes is the excessive use of chemical fertilizers; and that tax measures may be effective to modify human behaviors, the goal is to evaluate the way in which the national tax system can help to restore the quality of the Argentine eutrophic water resources and to develop normative proposals in that direction. To achieve this goal, the Article will first develop the link between tax measures and environmental protection; second, it will study the legal experience of other countries when applying taxes on fertilizers to tackle eutrophication; and, finally, it will analyze the different alternatives within the Argentine tax system to discourage the use of fertilizers. In short, the Article shows that Argentina is not currently taking advantage of environmental taxation to modify agricultural practices involved in the eutrophic process of its water resources. However, considering the experiences of other countries and the lessons learned, Argentina has the potential to address the issue of eutrophication through environmental taxation through two basic alternatives: an increase of the tax burden on agricultural activity and a reduction of the tax burden that affects farmers who implement sustainable agricultural practices.

INTRODUCTION

During the last several decades, some Argentine rivers, lakes, and reservoirs have been under eutrophic conditions that affect their composition and place the population and the environment in jeopardy, even though the population density and the number of inhabitants per unit of water surface are very low.¹ Eutrophication is a process of water deterioration caused by the excessive and uncontrolled enrichment of nutrients, mainly nitrogen and phosphorus, which conditions its use and generates ecological, health, economic, and social impacts.² Hence

¹ Rolando Quirós, *La Eutrofización de las Aguas Continentales de Argentina*, in *EL AGUA EN IBEROAMÉRICA: ACUÍFEROS, LAGOS Y EMBALSES* 43, 43–44 (Alicia Fernández ed., 2000).

² See Enio Girão et al., *Seleção dos Indicadores da Qualidade de Água no Rio Jaibaras pelo Emprego da Análise da Componente Principal*, 38 *REVISTA CIÊNCIA AGRONÔMICA* 17, 17–24 (2007).

the importance of studying it and the urgency of finding effective alternatives to solve it. However, this ecological problem is present not only in Argentina but in several other countries whose water resources are also affected by this phenomenon.³

Eutrophication is the process of the decrease of dissolved oxygen in the water and the increase of plant material (biomass), which forms dense floating layers covering the entire surface of the body of water. Consequently, underwater life is affected by the lower quantity and quality of light and dissolved inorganic carbon due to competition with other primary producers.⁴ Eutrophication can originate from natural causes, although it is generally linked to anthropogenic activity.⁵ Several human activities contribute to developing eutrophication, but intensive agriculture plays a leading role in many of the Argentine rivers and lakes due to the excessive use of fertilizers and agrochemicals.⁶ Eutrophication caused by intensive agriculture is an environmental problem that is affecting many water resources worldwide.⁷ Although many water resources around the country are affected,⁸ the most dangerous ecological problem is located in the Pampean Region.⁹

³ Today it is believed that there are more than 500 dead zones due to eutrophication in the world. See OMAR ARELLANO-AGUILAR ET AL., *ZONAS MUERTAS: LOS ECOSISTEMAS DEL MUNDO AMENAZADOS POR LA CONTAMINACIÓN CON FERTILIZANTES*, GREENPEACE 7 (2017).

⁴ See Munemitsu Akasaka & Noriko Takamura, *The Relative Importance of Dispersal and the Local Environment for Species Richness in Two Aquatic Plant Growth Forms*, 120 OIKOS 38, 39 (2011).

⁵ See ALEJANDRA VOLPEDO ET AL., *El Proceso de Eutrofización en la Región Pampeana (Argentina)*, in *LOS RECURSOS HÍDRICOS EN LA REGIÓN DEL MERCOSUR: ESTUDIOS DE CASO 105* (Alicia Fernández Cirelli & Luiz Augusto do Amaral eds., 2009).

⁶ See Martín Espósito et al., *Contaminación Natural y Eutrofización en la Cuenca del Arroyo El Divisorio, Argentina*, 85 INT'L J. EXPERIMENTAL BOTANY (PHYTON) 51, 52 (2016); Rolando Quirós, *Cianobacterias en Lagos y Embalses de Argentina: Década del 80*, in 2 SERIE DE DOCUMENTOS DE TRABAJO DEL ÁREA DE SISTEMAS DE PRODUCCIÓN ACUÁTICA 1, 18 (2004).

⁷ For example, the Chesapeake Bay and Mississippi-Atchafalaya River Basin in the United States; the Baltic Sea in Europe; Pearl River in China; and Seto Inland Sea in Japan. See Mindy Selman & Suzie Greenhalgh, *Eutrophication: Policies, Actions, and Strategies to Address Nutrient Pollution*, 3 WATER QUALITY: EUTROPHICATION & HYPOXIA 1, 2 (2009).

⁸ See Cristina Fernández et al., *Vegetación Acuática Bioindicadora de Eutrofización del Alto Valle de Río Negro (Argentina)*, 28 ERNSTIA 45, 49 (2018); Quirós, *supra* note 1, at 46.

⁹ See Rolando Quirós et al., *Los Efectos de la Agriculturización del Humedal Pampeano Sobre la Eutrofización de sus Lagunas*, in *EUTROFIZAÇÃO NA AMÉRICA DO SUL 1* (José Galizia Tundisi, Takako Matsumura Tundisi & Corina Sidagis Galli eds., 2006).

The Pampean Region represents a land area of 52.3 million hectares that includes the entire Province of Buenos Aires and part of the provinces of Córdoba, Entre Ríos, La Pampa, and Santa Fe where almost 100% of the area presents optimal conditions for agricultural activities. Its huge wealth and productive potential “make it a region with competitive advantages for the production of grains and meat.”¹⁰ This explains why this area suffers the greatest eutrophication of water resources due to excessive nutrients derived from fertilizers and agrochemicals. The rivers most strongly affected by the eutrophication generated by intensive agriculture are the following: Río de la Plata¹¹, Río Paraná,¹² Río Sauce Grande,¹³ Río Tercero,¹⁴ and Río Uruguay.¹⁵ Unfortunately, the nutrients from the fertilizers gradually replaced the oligotrophic system¹⁶ that characterized all these rivers for decades with a eutrophic¹⁷ or mesotrophic one,¹⁸ generating an ecological situation that is very difficult to revert in the short term,¹⁹ forcing the country to adopt urgent and effective measures. It is also important to consider that eutrophication is not only generating serious environmental problems for the country, but it also affects other

¹⁰ VOLPEDO, *supra* note 5, at 4.

¹¹ See Quirós, *supra* note 6, at 1.

¹² See *id.*

¹³ See Espósito, *supra* note 6, at 5.

¹⁴ See Claudia Ledesma et al., *Determinación de Indicadores de Eutrofización en el Embalse Río Tercero, Córdoba (Argentina)*, 44 REVISTA CIÊNCIA AGRONÔMICA 419 (2013).

¹⁵ See Guillermo Chalar, *Dinámica de la Eutrofización a Diferentes Escalas Temporales: Embalse Salto Grande (Argentina-Uruguay)*, in EUTROFIZAÇÃO NA AMÉRICA DO SUL 87 (José Galizia Tundisi, Takako Matsumura Tundisi & Corina Sidagis Galli eds., 2006).

¹⁶ Oligotrophic refers to “[w]aters that are relatively low in nutrients and cannot support much plant life,” according to European Environmental Agency, *Glossary Definitions*, EUR. ENV'T AGENCY, <https://www.eea.europa.eu/help/glossary/eea-glossary/oligotrophic> [<https://perma.cc/PVD9-LJR6>] (last visited Mar. 18, 2022).

¹⁷ Eutrophication is “[a] process of pollution that occurs when a lake or stream becomes over-rich in plant nutrient; as a consequence, it becomes overgrown in algae and other aquatic plants. The plants die and decompose. In decomposing the plants rob the water of oxygen and the lake, river or stream becomes lifeless. Nitrate fertilizers which drain from the fields, nutrients from animal wastes and human sewage are the primary causes of eutrophication,” according to European Environmental Agency, *Glossary Definitions*, EUR. ENV'T AGENCY, <https://www.eea.europa.eu/archived/archived-content-water-topic/wise-help-centre/glossary-definitions/eutrophication> [<https://perma.cc/A9TC-ACBR>] (last visited Mar. 18, 2022).

¹⁸ See Raquel Bazán et al., *Teledetección y Modelado Numérico para el Análisis de la Calidad de Agua del Embalse*, 20 INGENIERÍA HIDRÁULICA EN MÉXICO 121 (2005).

¹⁹ See Quirós, *supra* note 9, at 3.

regional economic sectors that directly depend on the good condition of Argentine lakes and rivers.²⁰

To understand the role of fertilizers in agriculture, it is necessary to go back a century when the Haber-Bosch process was discovered. This process involves the use of nutrients from artificial fertilizers to accelerate crop growth and improve crop yields. Although this discovery made it possible to produce food on a large scale and at a low cost,²¹ over the years it began to cause collateral environmental effects that only became known much later.²² A century after this groundbreaking discovery, the time has come to rethink ways of developing agricultural activities to ensure the production of food on an increasingly populated planet while minimizing their environmental impact.

Even though the causes and consequences of water eutrophication have been known for decades, Argentina virtually failed to enact provisions to deal with this critical situation. The first and few laws on fertilizer management date back to 1973, Laws 20466²³ and 20496,²⁴ but they were not devised to solve this ecological problem. Rather, they sought to promote the intensive use of fertilizers.²⁵ The context and circumstances of that moment fifty years ago may not have been enough to justify, or at least understand, this normative decision. But nowadays, it is inexplicable that no new provisions or legal modifications have been issued to reverse the eutrophication of water

²⁰ See Fernández, *supra* note 8, at 6.

²¹ See Yan Wang et al., *What Could Promote Farmers to Replace Chemical Fertilizers with Organic Fertilizers?*, 199 J. CLEANER PROD. 882, 882–90 (2018).

²² RALF IBISCH ET AL., TECHNICAL REPORT NO. 2: EUROPEAN ASSESSMENT OF EUTROPHICATION ABATEMENT MEASURES ACROSS LAND-BASED SOURCED, INLAND, COASTAL, AND MARINE WATERS 5–7 (2016).

²³ Law No. 20466, May 23, 1973, B.O. 22681 (Arg.), on the control of fertilizers (published on Jun. 6, 1973).

²⁴ Law No. 20496, May 23, 1973, B.O. 22720 (Arg.), on fertilizers (published on Aug. 3, 1973).

²⁵ On the one hand, Law 20466 regulated the control of the production, import, export, possession, fractionation, distribution, and sale of fertilizers throughout the national territory in order to ensure their use and quality. Law No. 20466, May 23, 1973, B.O. 22681, art. 1 (Arg.). The Law was regulated by Decree 4830/1973, in which fertilizers are defined. Decree 4830/1973, June 6, 1973, art. 2, 3 (Arg.). On the other hand, Law 20496 declared the promotion of fertilizers to increase agricultural production a matter of national interest. Law No. 20496, May 23, 1973, B.O. 22720, art. 1 (Arg.). Among the measures taken to promote their use, there is a 5-fiscal-year deduction in Income Tax (art. 3). *Id.* at art. 3. This Law was regulated by Decree 1152/1984, which specifies subsidies and plans to promote an intensive use of fertilizers. Decree 1152/1984, April 3, 1984, art. 2 (Arg.).

resources with all the detailed scientific information available on the quality of Argentine lakes and rivers.

This ecological problem may be further aggravated by changes in food consumption habits generated by the Coronavirus Disease of 2019 (COVID-19). Research and reports demonstrate that this pandemic is modifying our eating habits,²⁶ since the consumption of fruits and vegetables has risen considerably due to the conviction that they will help us combat infections related to COVID-19.²⁷ This change in consumption could favor intensive agriculture around the world. We do not really know how long this change in food consumption habits will persist, but even if it lasts a couple of years, it will have direct consequences for the ecosystem of the water resources. This issue is not part of this Article's research goals, but it leads us to reflect even more on the importance of studying the consequences of eutrophication and the way to reverse them.

The author agrees that even though there are several juridical ways of reversing the consequences of eutrophication, one of the most effective is to reduce the use of chemical fertilizers for agricultural purposes,²⁸ since it has been shown that farmers tend to use more fertilizer than necessary to ensure the harvest.²⁹ If we talk about modifying human behaviors, environmental tax measures could play an important role,³⁰ even where the agricultural sector is involved.³¹

Considering that eutrophication entails serious consequences for Argentina; that one of its main causes is the excessive use of fertilizers; and that tax measures may be effective to modify human behaviors, this Article will evaluate the way in which the national tax system can help

²⁶ See Isabel Madzorera et al., *Impact of COVID-19 on Nutrition, Food Security, and Dietary Diversity and Quality in Burkina Faso, Ethiopia and Nigeria*, 105 AM. J. TROPICAL MED. & HYGIENE 295 (2021); EIT FOOD, COVID-19 IMPACT ON CONSUMER FOOD BEHAVIOURS IN EUROPE (2020), https://www.eitfood.eu/media/news-pdf/COVID-19_Study_-_European_Food_Behaviours_-_Report.pdf [<https://perma.cc/S2JX-FUTF>].

²⁷ *Nutrition Advice for Adults During the COVID-19 Outbreak*, WORLD HEALTH ORG., <http://www.emro.who.int/nutrition/news/nutrition-advice-for-adults-during-the-covid-19-outbreak.html> [<https://perma.cc/A7G3-RNVY>] (last visited Mar. 18, 2022).

²⁸ See Espósito, *supra* note 6, at 52; Quirós, *supra* note 9, at 6.

²⁹ SUE SCOTT, EPA, ENVIRONMENTAL ECONOMICS: FERTILIZER TAXES – IMPLEMENTATION ISSUES I (2005).

³⁰ See RODOLFO SALASSA BOIX: TRIBUTACIÓN Y MEDIO AMBIENTE: UNA ALTERNATIVA SUSTENTABLE (2018).

³¹ See Sanna Lötjönen & Markku Ollikainen, *Does Crop Rotation with Legumes Provide an Efficient Means to Reduce Nutrient Loads and GHG Emissions?*, 98 REV. AGRIC. FOOD ENV'T STUD. 283, 290 (2017).

to restore the quality of the Argentine eutrophic water resources and will present normative proposals in that direction.

To achieve the proposed goal, this Article is based on a dogmatic and interdisciplinary juridical analysis, with a special focus on tax, environmental, and comparative law, and is organized in three parts that will lead to the conclusion. In Part I, the Article will develop the link between tax measures and environmental protection (environmental taxation) through their potential to change human behaviors. In Part II, the Article will study and compare the legal experience of other countries when applying environmental tax measures on agricultural fertilizers to tackle eutrophication. In Part III, based on this international experience, the Article will analyze the different possible alternatives within the Argentine tax system to discourage the use of fertilizers and avoid the deterioration of water resources.

I

ENVIRONMENTAL TAXATION

Environmental taxation is that area of tax law that seeks to protect the environment by modifying the polluting behavior of taxpayers through environmental taxes and ecological tax benefits. There is a “wide variety of state mechanisms for environmental protection, but in recent decades Environmental Taxation has gained an increasing role.”³² The reports of the Organization for Economic Cooperation and Development (OECD) show that in the last twenty-five years most of its member states have implemented environmental tax reforms.³³ All this shows that tax law is an effective legal instrument for environmental protection.³⁴

Environmental taxes are “those levies whose essential purpose is to discourage polluting behaviors, beyond the allocation of the collected funds.”³⁵ First, they are authentic taxes and, because of that, have the

³² See BOIX, *supra* note 30, at 31.

³³ ORG. FOR ECON. COOP. & DEV., CONSUMPTION TAX TRENDS 2016: VAT/GST AND EXCISE RATES, TRENDS AND POLICY ISSUES (2016).

³⁴ See Melissa Castello, *Contribuição de Intervenção no Domínio Econômico Sobre os Combustíveis: Um Superfund Brasileiro?*, 44 REVISTA DE DIREITO AMBIENTAL 77, 100 (2006).

³⁵ Rodolfo Salassa Boix, *Fiscalidad Ambiental: Cuestiones Preliminares*, in LA PROTECCIÓN AMBIENTAL A TRAVÉS DEL DERECHO FISCAL 29 (Rodolfo Salassa Boix ed., 2015).

same elements that characterize the taxable event of all levies and are also limited by the same constitutional tax principles.³⁶ Second, their main purpose is to discourage polluting behaviors, and their secondary purpose is fiscal collection because they never lose their tax essence. That is why the tax burden “must be strong enough to really influence the taxpayers’ behavior in the sense that it is not the same for them to damage the environment or not to.”³⁷ Third, although these levies seek to protect the environment, they do not have a punitive nature because economic sanctions depend on having committed an infraction and the payment of a tax on the taxable event. The levied behavior can never be assimilated as an infraction. Fourth, their environmental nature is not linked to the ecological allocation of the collection “but to discourage polluting behaviors, which reveals the deterrent function of these kinds of taxes.”³⁸

Ecological tax benefits are “fiscal advantages, justified in the constitutional principle of environmental protection, that seek to cancel, reduce, or postpone the payment of a tax in order to encourage environmental behaviors.”³⁹ While environmental taxes attempt to discourage polluting behaviors, ecological tax benefits attempt to encourage environmentally friendly behaviors. These benefits are often likened to subsidies, but they affect the budget in different ways. Tax benefits affect the budget in the field of income, by forgoing all or part of the collection from taxpayers, whereas subsidies affect it in the field of public spending, as it involves a disbursement of public resources to private citizens.

II

TAXATION ON FERTILIZERS IN COMPARATIVE LAW

Although environmental taxes have been spreading worldwide since the 1990s,⁴⁰ those that seek to discourage the use of agricultural fertilizers are less widespread.⁴¹ However, as of 1972, there are records

³⁶ See Janet Milne, *Environmental Taxation in the United States: The Long View*, 15 LEWIS & CLARK L. REV. 417, 428 (2011).

³⁷ See Boix, *supra* note 35, at 31.

³⁸ Milne, *supra* note 36, at 439.

³⁹ Boix, *supra* note 35, at 38.

⁴⁰ Rodolfo Salassa Boix, *The Environmental Taxation in Latin America*, in TAX & ENV'T 175 (Roberta Mann & Tracey Roberts eds., 2007).

⁴¹ SCOTT, *supra* note 29, at 15.

of a tax on fertilizers in Denmark,⁴² which was later replicated in other European countries⁴³ like Finland in 1976,⁴⁴ Sweden in 1984,⁴⁵ and Norway in 1988.⁴⁶ Also interesting are the levies issued by Austria in 1986,⁴⁷ the United States in 1994,⁴⁸ and the Netherlands in 1998.⁴⁹ Although hardly any of these levies are currently in force, their successes and mistakes are useful to implement similar environmental taxes in Argentina to restore the quality of the water resources affected by eutrophication.

A. Finland

In 1976, Finland was one of the first countries to establish a national tax on agricultural fertilizers, abrogated in 1994 as a result of its accession to the European Union (EU). Initially, the tax was applied to the general amount of fertilizer and not to the specific amount of mineral contained in it. This criterion changed in 1992 when the nitrogen and potassium contained in chemical fertilizers began to be taxed, which helped to discourage their use by farmers.⁵⁰ That is why it was initially a tax on fertilizers but later became a tax on fertilizer minerals.

The calculation of the tax consisted of applying a fixed amount per kilogram of artificial fertilizer (between 1976 and 1992) or per kilogram

⁴² ANDERS BRANTH PEDERSEN, PESTICIDE TAX IN DENMARK, INST. FOR EUR. ENV'T POL'Y (2016), <https://ieep.eu/uploads/articles/attachments/504788d7-db01-4dd8-bece-ee7b9e63979e/DK%20Pesticide%20Tax%20final.pdf?v=63680923242> [<https://perma.cc/75KD-8JZS>].

⁴³ François Bel et al., *Fertilizer Taxation and Regulation of Nonpoint Water Pollution: A Critical Analysis Based on European Experiences*, 2 INT'L J. WATER 256 (2004).

⁴⁴ See Rougoor et al., *Experiences with Fertilizer Taxes in Europe*, 44 J. ENV'T PLAN. & MGMT. 877, 883 (2001).

⁴⁵ MIKAEL ANDERSEN ET AL., EUR. COMM'N, CAPACITY BUILDING, PROGRAMMATIC DEVELOPMENT AND COMMUNICATION IN THE FIELD OF ENVIRONMENTAL TAXATION AND BUDGETARY REFORM I (2016).

⁴⁶ ORG. FOR ECON. COOP. & DEV., AGRICULTURE, TRADE AND THE ENVIRONMENT: THE DAIRY SECTOR 138 (2004).

⁴⁷ CARIN ROUGOOR & WOUTER VAN DER WEIJDEN, CTR. FOR AGRIC. & ENV'T, TOWARDS A EUROPEAN LEVY ON NITROGEN: A NEW POLICY TOOL FOR REDUCING EUTROPHICATION, ACIDIFICATION AND CLIMATE CHANGE 5 (2001).

⁴⁸ Donna Lee & Walter Milon, *Flexible Incentives and Water Quality Control Technologies for the Everglades Agricultural Area*, in FLEXIBLE INCENTIVES FOR THE ADOPTION OF ENVIRONMENTAL TECHNOLOGIES IN AGRICULTURE 214 (Frank Casey, Andrew Schmitz, Scott Swinton & David Zilberman eds., 1999).

⁴⁹ PATRIK SÖDERHOLM, ECONOMIC INSTRUMENTS IN CHEMICALS POLICY: PAST EXPERIENCES AND PROSPECTS FOR FUTURE USE 35 (2009).

⁵⁰ See Rougoor, *supra* note 44, at 883–84.

of minerals contained in these fertilizers (between 1993 and 1994), depending on the criterion used.⁵¹ The amount of the levy ranged between €0.006 and €0.09 per kilogram of fertilizer until 1992, and from then on, the amount of the tax became €0.44 per kilogram of the potassium or nitrogen contained in the fertilizer.⁵² The amount of fertilizers used decreased in its first tax year, but less than expected because it levied fertilizers directly and not the amount of minerals they contained.⁵³ But since 1992, not only was the taxable event modified, but the tax amount was also increased, resulting in a sharp drop in the use of artificial fertilizers (thirty-nine million kilograms).⁵⁴

B. Sweden

Almost forty years ago, the Swedish government began to tax artificial fertilizers in a two-stage normative process. A tax on the nitrogen, phosphorus, and potassium contained in fertilizers was enacted in 1984 to subsidize their exportation,⁵⁵ resulting in an increase in their price.⁵⁶ In 1994 phosphorus was replaced by cadmium.⁵⁷ This levy had a greater environmental basis, since it sought to curb the polluting consequences of such fertilizers.⁵⁸ Thus, the nitrogen, phosphorus, potassium, and cadmium present in agricultural fertilizers were taxed. Unfortunately, the law is not currently in force. The tax was finally abrogated in 2009.⁵⁹ Its repeal was due to the 2008 global financial crisis and strong pressure from the agricultural sector.

The taxable event was the importation or manufacture of fertilizers based on nitrogen, potassium, phosphorus, or cadmium, without any type of tax benefit to alleviate the tax burden. The importers and manufacturers were the taxpayers who had to pay the tax each month, based on the amount of fertilizer imported or produced. The total tax burden on minerals was €0.24 per kilogram of nitrogen and €0.50 per

⁵¹ Bel, *supra* note 43.

⁵² See Rougoor, *supra* note 44, at 883.

⁵³ ECOTEC, TAXES ON FERTILIZERS AND MINERAL SURPLUSES: STUDY ON ENVIRONMENTAL TAXES AND CHARGES IN THE EU 129, 135 (2001).

⁵⁴ *Id.*

⁵⁵ Lag om skatt på gödselmedel (Svensk författningssamling [SFS] 1984:409) (Swed.) (Act relative to taxation of fertilizers).

⁵⁶ ANDERSEN, *supra* note 45, at 2.

⁵⁷ SÖDERHOLM, *supra* note 49, at 40.

⁵⁸ ECOTEC, *supra* note 53, at 136.

⁵⁹ SCOTT, *supra* note 29, at 26.

kilogram of potassium,⁶⁰ which meant an increase of between fifteen and thirty-five percent in the price of those fertilizers.⁶¹

Time proved that these taxes helped to deter the excessive use of chemical fertilizers that had previously been applied disproportionately.⁶² It also promoted the replacement of these fertilizers by organic ones derived from animals.⁶³ One of their biggest obstacles was the lack of similar taxes in the rest of Europe, harming the competitive conditions of the Swedish agricultural sector, which finally led to their repeal in 2009.⁶⁴ The positive environmental results that these levies demonstrated during their application motivated environmental nongovernmental organizations to request their re-implementation,⁶⁵ but the political scenario is not so favorable for the moment.⁶⁶

Competitive conditions are a usual and undesirable obstacle for any environmental tax, and levies on fertilizers are no exception. The ideal scenario would be to implement a global charge on fertilizers to avoid any inequality in that condition, but this solution is practically impossible since nowadays there is no supranational entity with fiscal competence, not even the European Union. Perhaps the solution is to agree on the implementation of similar regional taxes on fertilizers. In the specific case of Argentina, the Member States of the Common Market of the South (MERCOSUR) could agree to implement a similar tax on agricultural activities that generates eutrophication.

C. Austria

Austria established a tax on fertilizer minerals in 1986 that was repealed eight years later in 1994 when the country joined the EU. Over the years, its goal was redefined to promote the production of crops that

⁶⁰ Patrik Söderholm & Anna Christiernsson, *Policy Effectiveness and Acceptance in the Taxation of Environmentally Damaging Chemical Compounds*, 11 ENV'T SCI. & POL'Y 240, 248 (2008).

⁶¹ *Id.*

⁶² See KONJUNKTURINSTITUTET, MILJÖ, EKONOMI OCH POLITIK (2004); HELLE NIELSEN, BOUNDED RATIONALITY IN DECISION-MAKING: HOW COGNITIVE SHORTCUTS AND PROFESSIONAL VALUES MAY INTERFERE WITH MARKET-BASED REGULATION (2010).

⁶³ ANDERSEN, *supra* note 45, at 1.

⁶⁴ See STATENS OFFENTLIGA UTREDNINGAR (SOU), SKATT PÅ HANDELSGÖDSEL OCH BEKÄMPNINGSMEDEL? 9 (2003).

⁶⁵ See DAVID PEARCE & PHOEBE KOUNDOURI, FERTILIZER AND PESTICIDE TAXES FOR CONTROLLING NON-POINT AGRICULTURAL POLLUTION 4 (2003).

⁶⁶ See ANDERSEN, *supra* note 45, at 1.

require fewer chemical fertilizers, especially legumes, because they absorb their own nutrients directly from the air. This generated a reduction of 6000 tonnes of nitrogen from the atmosphere, which was six percent of the total amount of nitrogen in the atmosphere.⁶⁷ The tax was calculated by applying a fixed amount to each kilogram of mineral, depending on the period. Between 1986 and 1990, the amount of the tax was €0.25 per kilogram of nitrogen, €0.15 per kilogram of phosphorus, and €0.07 per kilogram of potassium.⁶⁸ And between 1991 and 1994, the amounts practically doubled: €0.47 per kilogram of nitrogen, €0.47 per kilogram of phosphorus, and €0.13 per kilogram of potassium.⁶⁹

This tax clearly contributed to reducing the use of fertilizers as a result of the farmers' environmental education and the increase in fertilizer prices dating from 1987, in addition to financing the promotion of natural fertilizers (manure) or crops that do not require so many nutrients (legumes). Between 1987 and 1994, the amount of nitrogen fertilizers reduced by 0.5 kilograms per hectare annually, and the impact of this on underground layers was confirmed several years later.⁷⁰

The link between environmental education and environmental taxation is evident.⁷¹ On the one hand, environmental education can assist environmental taxation by explaining to taxpayers the reason for discouraging some polluting behavior and, ultimately, establishing a new tax. On the other hand, environmental taxation can influence environmental education if part of the ecological tax collection is used to finance ecological programs to educate farmers to avoid the agricultural practices that could generate eutrophication. Considering the reluctance from the agricultural sector in Argentina to see a new fertilizer tax implemented, in my opinion it would be necessary to place a strong emphasis on environmental education, since it would help taxpayers to accept and legitimize the controversial new tax.

⁶⁷ ECOTEC, *supra* note 53, at 131.

⁶⁸ SÖDERHOLM, *supra* note 49, at 32.

⁶⁹ *Id.*

⁷⁰ ECOTEC, *supra* note 53, at 132.

⁷¹ See Laura Foradori & Rodolfo Salassa Boix, *La Educación Ambiental y la Fiscalidad Ambiental: Puntos de Encuentro*, 5 ANUARIO DEL CENTRO DE INVESTIGACIONES JURÍDICAS Y SOCIALES 89, 103 (2014).

D. United States (Florida)

In 1994, the State of Florida in the United States established the Everglades Agricultural Privilege Tax,⁷² a tax on property, lease, and any other right on those lands located within the agricultural area of the Everglades National Park, due to the phosphorus resulting from the agricultural activities carried out there. The wealth of the soil in these lands makes their economic exploitation a privilege, and those who would do so must therefore pay a special real estate levy.⁷³ The taxable event and name of the tax is based on the presumption that all the land included in that area is used for agricultural purposes.

The levy includes all agricultural activity, as its intensity contributes to the nutrient runoff and eutrophication of the Everglades National Park lakes,⁷⁴ especially Lake Okeechobee.⁷⁵ Reports show that the agricultural activity carried out in that area is responsible for leaching high levels of fertilizer minerals, especially phosphorus, nitrate, and ammonia, resulting from their inefficient use by producers.⁷⁶

The tax is calculated by applying a fixed amount for each acre occupied by those properties located within the agricultural area. In 1994, the amount of the levy was \$24.89 per acre, and it was increased until its maximum value in 2013 of \$35 per acre.⁷⁷ The idea was to allow the agricultural sector to adapt gradually before the tax was applied in full. However, as of 2014, the amount is being reduced until it reaches \$10 per acre in 2036.⁷⁸ Today the tax is fixed at \$25 per acre.⁷⁹ Although the tax applies to the entire agricultural area of the Everglades, annual fiscal benefits are granted to lands where farmers demonstrate a reduction of phosphorus discharge through good agricultural practices.⁸⁰

⁷² This particular tax is defined by the Everglades Forever Act as set forth in sections 373.4592(2)(f) and 373.4592(15).

⁷³ FLA. STAT. § 373.4592(6)(a) (1994).

⁷⁴ Panchabi Vaithyanathan & Curtis Richardson, *Nutrient Profiles in the Everglades: Examination Along the Eutrophication Gradient*, 205 SCI. TOTAL ENV'T 81, 83 (1997).

⁷⁵ See Daniel Engstrom et al., *A Reevaluation of the Cultural Eutrophication of Lake Okeechobee Using Multiproxy Sediment Records*, 16 ECOLOGICAL APPLICATIONS 1194 (2006).

⁷⁶ See Dorota Haman & Marc Svendsen, *Managing the Florida Everglades: Changing Values, Changing Policies*, 20 IRRIGATION & DRAINAGE SYS. 283, 291 (2006).

⁷⁷ FLA. STAT. § 373.4592(6)(c) (2021).

⁷⁸ *Id.*

⁷⁹ *Id.*

⁸⁰ *Id.*

This tax has discouraged intensive agriculture in the Everglades, and it has proved to be an efficient tool for reducing the level of phosphorus that runs into Lake Okeechobee.⁸¹ The tax has also raised funds to restore the Lake's ecosystem and finance projects to reduce the use of fertilizers. Even though environmental taxes are defined by the deterring function of the taxable event and not by the ecological allocation of the collection, it is ecologically recommendable to use the collection to recover the polluted natural resources, whose damage the tax was intended to mitigate. Additionally, the collection could be used to finance ecological programs to educate farmers to use fewer chemical fertilizers or replace them with natural fertilizers, as this Article concludes in Section II.C.

E. Netherlands

Between 1998 and 2005, the Netherlands implemented a national tax that levied the excess nitrogen and phosphate per hectare derived from agricultural activities known as the Mineral Accounting System (MINAS), which worked as a mechanism to account for certain minerals and thus collect a tax on their excessive use.⁸² Its purpose was to improve the efficiency of artificial fertilizers to reduce nutrients, in line with the Directive of the European Union.⁸³ But in October 2003, the tax was questioned by the Court of Justice of the European Union, as the court interpreted that the tax did not comply with the content of the Directive.⁸⁴ This strongly influenced MINAS's subsequent repeal in 2005.

As a result of this new tax, all the farmers had to record the flow of nitrogen and phosphate that entered and left their lands by any manner (food, fertilizers, seeds, vegetables, animals, and manure), in order to levy the excess of those minerals. MINAS did not directly regulate the amount of manure and fertilizers applied to the land; rather, it was the amount of mineral losses that was controlled. Therefore, it was necessary to calculate the agricultural balance considering the difference between inputs and outputs. This process implied a fixed

⁸¹ Haman & Svendsen, *supra* note 76, at 300.

⁸² Stuart Wright, *The Failure of the Dutch MINAS Policy: A Transaction Cost Analysis*, 98 ENV'T ECON. & INV. ASSESSMENT 107, 108 (2006).

⁸³ Council Directive 91/676, 1991 O.J. (L 375) (EC) (concerning the protection of waters against pollution caused by nitrates from agricultural sources).

⁸⁴ ORG. FOR ECON. COOP. & DEV., AGRICULTURAL POLICIES IN OECD COUNTRIES: MONITORING AND EVALUATION 2007, at 138 (2007), https://read.oecd-ilibrary.org/agriculture-and-food/agricultural-policies-in-oecd-countries-2007_agr_oecd-2007-en#page1 [<https://perma.cc/7NSU-NX6H>].

amount on mineral surpluses (nitrogen and phosphate) but not on all the minerals used. The limit for calculating that excess tightened over the years to allow farmers to be aware of the ecologic problem and gradually adjust their activity to the new tax.

The limit to determine the excessive use of minerals was set in four periods.⁸⁵ In 1998 and 1999, the limit was 300 kilograms per hectare (grasslands) or 175 kilograms per hectare (arable land) for nitrogen and 40 kilograms per hectare for phosphate in all cases.⁸⁶ In the years 2000 and 2001, it was 250 kilograms per hectare (grasslands) or 125 kilograms per hectare (arable land) for nitrogen and 35 kilograms per hectare for phosphate in all cases. In 2002 the limit was 220 kilograms per hectare (grasslands) or 110 kilograms per hectare (arable land) for nitrogen and 30 kilograms per hectare for phosphate in all cases.⁸⁷ Since 2003 the limit was classified according to the type of land: clay and peat or sandy soil. In the former, the limit for nitrogen was 180 kilograms per hectare (grasslands) or 100 kilograms per hectare (arable land) and for phosphate 20 kilograms per hectare (grasslands) or 25 kilograms per hectare (arable land).⁸⁸ In sunny lands, the limit for nitrogen was 140 kilograms per hectare (grasslands) or 60 kilograms per hectare (arable lands) and for phosphate 20 kilograms per hectare (grasslands) or 25 kilograms per hectare (arable lands).⁸⁹

The amount that was applied to the excessive mineral also increased over time, considering the same periods and type of minerals. In 1998 and 1999 the tax was €0.7 per kilogram for nitrogen and €1.1 per kilogram for phosphate, in 2000 and 2001 it was €0.7 per kilogram and €2.3 per kilogram, in 2002 it was €0.7 per kilogram and €2.2 per kilogram, and from 2003 until its abrogation the amount was €2.3 per kilogram and €9.13 per kilogram, respectively.⁹⁰

This original system of registration and taxation of nutrients had positive and negative aspects during the years that it was in force. Regarding the former, MINAS helped modify the farmers' behaviors regarding the efficient use of agricultural fertilizers and promoted the search for alternatives to reduce the excess mineral that seeped into the

⁸⁵ SCOTT, *supra* note 29, at 23.

⁸⁶ *Id.* at 19.

⁸⁷ *Id.*

⁸⁸ *Id.*

⁸⁹ *Id.*

⁹⁰ SÖDERHOLM, *supra* note 49, at 35.

underground layers.⁹¹ The negative aspects of the Dutch system include the high administrative costs of its implementation and supervision, the low rate of collection, and the displeasure shown by a large part of the agricultural sector,⁹² which led to several legal complaints.⁹³

While this original system is quite interesting, since it specifically levies the fertilizer excess that will pollute water resources, it can also obtain promising results with traditional taxes on fertilizers that do not have the same excessive administrative costs. Those safe costs could be used to educate farmers or finance ecological tax benefits, which would also help to avoid the displeasure of the agricultural sector.

If we want to have success when implementing measures to recover the quality of water resources, we need to consider the positive aspects and learn from the negative experiences of other countries around the world. In the following Part, this Article will focus on the tax possibilities derived from the Argentine fiscal system.

III

TAXATION ON FERTILIZERS IN ARGENTINA

This Article has demonstrated that environmental taxation offers two methods to help solve the eutrophication of Argentine water resources. On the one hand, it can discourage the excessive use of fertilizers by increasing the tax burden. For this goal, it is necessary to implement a new environmental tax or modify the taxable event of the current ones. On the other hand, it can encourage the minimum use of chemical fertilizers or encourage the use of other agricultural practices that replace them by lightening the tax burden. For these purposes, it is necessary to establish new tax benefits and eliminate those that send the opposite message because they promote the behavior we are interested in reducing. Besides the environmental tax measures, authentic green tax reform also includes the repeal of taxes, benefits, and even subsidies that harm the environment.⁹⁴

In order to give taxpayers the opportunity to prepare for the tax changes, a useful fiscal strategy is to start with ecological fiscal benefits and then move on to environmental taxes with a progressive increase

⁹¹ SCOTT, *supra* note 29, at 21.

⁹² See ECOTEC, STUDY ON THE ECONOMIC AND ENVIRONMENTAL IMPLICATIONS OF THE USE OF ENVIRONMENTAL TAXES AND CHARGES IN THE EUROPEAN UNION AND ITS MEMBER STATES (2003).

⁹³ See SCOTT, *supra* note 29, at 24.

⁹⁴ JOSÉ FANELLI, JUAN JIMÉNEZ & ISABEL LÓPEZ, AZCÚNAGA: LA REFORMA FISCAL AMBIENTAL EN AMÉRICA LATINA 9 (2015).

in the tax burden.⁹⁵ This strategy could also help the government to be better prepared for choosing the appropriate measure to implement over the following years.

A. Environmental Taxes

1. Implementation of New Taxes

Taking into account the international experience, the implementation of a new environmental tax in Argentina will basically involve levying the manufacture, sale, or import of chemical fertilizers on the general amount of fertilizer, like Finland, or the specific amount of minerals contained within it, like Austria, Finland, and Sweden; levying the land that is destined for intensive agriculture, along with ecological tax benefits for those farmers who reduce the use of chemical fertilizers, like Florida; and levying the underground discharge of such fertilizers, either on the whole discharge or the excess minerals, like the Netherlands.

Taxes on the manufacture, sale, or import of artificial fertilizers seek to increase their price to discourage demand for them and, ultimately, their use. This type of tax is close to the Value Added Tax (VAT), which, in fact, currently levies the sale of these products, although by a reduced rate for its application and final importation to Argentina. Rather than creating a new specific excise tax on fertilizers, it is easier to increase the VAT burden applied on fertilizers, but this decision would involve modifying a tax in force and not fixing a new one, which will be analyzed in the next section.

Taxes on rural properties seek to discourage intensive agriculture practices with a tax burden that can be neutralized through fiscal benefits for the responsible use of fertilizers and agrochemicals. This type of tax is linked to two specific Argentine levies: the Personal Property Tax (PPT), which levies individuals' property, and the repealed Minimum Presumed Income Tax (MPIT), which levied only companies' assets despite its strange name. On the one hand, the PPT includes rural properties, then exempts them from payment, and on the other, the MPIT levied these properties without exempting them but was abrogated in 2019.⁹⁶ That is why, at the national level, there are no taxes that affect rural properties, regardless of how fertilizers are

⁹⁵ SCOTT, *supra* note 29, at 21.

⁹⁶ Law No. 27260, June 29, 2016, B.O. 33424, art. 76 (Arg.) (on the National Program for historical repair for retired and pensioners, published on July 22, 2016).

applied. If there is a new tax implemented on rural properties, the National Congress needs to implement one that effectively applies to all rural properties where intensive agriculture is developed, irrespective of whether they belong to individuals or companies.

Taxes on the underground discharge of fertilizers, either exclusively measuring the whole discharge or the excess minerals discharged through agricultural balances, do not involve taxing polluting goods but rather polluting behaviors associated with the excessive use of fertilizers. Currently, there are no levies like this in Argentina. In the case of taxing the excess of discharged minerals, we have the precedent of the Dutch MINAS, which levied the excess of nitrogen and phosphate derived from agriculture. Considering the positive ecological results achieved with this system, we understand that it could be an interesting model for a similar tax in Argentina. Nevertheless, this fiscal strategy is not easy to implement because of the high administrative costs that its implementation and control may entail, the legal loopholes that may arise within the system, and the pressure from the agricultural sector that may spread due to lack of information and environmental education.

2. Modification of Current Taxes

This alternative leads us to two possible scenarios that were anticipated in the previous point: reformulating the VAT or the PPT. The first scenario shows a national tax on the general consumption of goods and services regulated by the Value Added Tax Law (VATL).⁹⁷ It is a complex excise tax that levies the different stages of production through a debit and credit system that allows the tax burden to be transferred to the final consumer. Among the taxable events are the sale of movable goods, the provision of services, and the definitive importation of movable goods.⁹⁸ This indicates that fertilizers and agrochemicals have been levied, although their final application and importation has a fiscal benefit that reduces its tax burden considerably.⁹⁹ That is why, in order to increase this tax burden, it becomes necessary to eliminate this fiscal benefit or keep it only for certain natural fertilizers that do not generate the same eutrophic results as the chemical ones.

⁹⁷ Law No. 23349, Aug. 7, 1986, B.O. 25978 (Arg.) (on the Value Added Tax, published on Aug. 25, 1986), ordered by Decree 280/97, March 26, 1997 (Arg.) (published on April 15, 1997).

⁹⁸ *Id.* at art. 1.

⁹⁹ *Id.* at art. 16.

The second scenario is a national tax on individuals' property regulated in the Personal Property Tax Law (PPTL).¹⁰⁰ We are dealing with a patrimonial national tax that applies to individuals and undivided inheritances that reside and are established within the country's territory for all their assets, located in the country or abroad, and to individuals or undivided inheritances that reside or are established in foreign countries for their assets located exclusively in Argentina.¹⁰¹ Thus, companies are not considered taxpayers of this tax. Among the levied assets are rural properties and land, regardless of the handling of fertilizers, although those properties are exempted from paying the tax by the same law.¹⁰² If the idea is to discourage the use of fertilizers, it would be very useful to eliminate this exemption or keep the fiscal benefit only for those rural properties where farmers demonstrate responsible and sustainable management of fertilizers and agrochemicals.

The advantage of an environmental tax is that it not only has the possibility to deter agricultural practices linked with eutrophication but also provides economic resources (collection) to recover the polluted water resources and finance the expenditure derived from the environmental fiscal benefits.

B. Ecological Fiscal Benefits

1. Implementation of New Fiscal Benefits

Tax benefits should be applied to those taxes that directly or indirectly affect intensive agricultural activity, since the idea is to reduce the current use of fertilizers in exchange for decreasing the tax burden. Based on this, as was anticipated in the previous point, we understand that the options in this case are to lighten the tax burden of current, new, or modified taxes that affect agriculture based on the excessive use of chemical fertilizers. By virtue of that, we could cancel, reduce, or postpone the payment of taxes to encourage environmental behaviors in this regard.

¹⁰⁰ Law No. 23966, August 1, 1991, B.O. 27201, tit. VI (Arg.) (on taxes, published on Aug. 20, 1991).

¹⁰¹ *Id.* at art. 17.

¹⁰² *Id.* at art. 21(f).

If we talk about national taxes in force, one of the best alternatives is related to the Income Tax¹⁰³ because Congress could reduce the tax burden of benefits derived from agricultural activities when farmers demonstrate the application of practices to avoid the consequences of intensive agriculture. If we focus on a new levy, in line with Section III.A.1, we must consider lightening the tax burden of the new taxable event when the agricultural activity is less damaging to the water resources. One option is reducing or eliminating the impact of charges that affect rural properties according to the quantity of used fertilizer. Finally, if we consider the modified national taxes, it is possible to postpone or reduce the VAT payments when farmers buy natural fertilizers.

2. Abrogation of Current Fiscal Benefits

The only tax measures in force in Argentina on fertilizers are fiscal benefits that unfortunately encourage their use, which sends taxpayers the opposite messages from those I propose to reverse the eutrophication of water resources. This fiscal strategy stems from 1973, when the importance of fertilizers for agricultural activity started to increase; then it was reformulated in the 1990s,¹⁰⁴ and finally, it intensified at the beginning of this century with the abovementioned benefits recognized by VATL and PPTL.¹⁰⁵ But nowadays, these benefits are inexplicable considering the scientific information available on the quality of Argentine lakes and rivers.

Article 1 of Law 20496 of 1973 was specifically enacted to declare the national interest of the intensive use of fertilizers. The following articles fix as fiscal benefit the possibility to use a special deduction for five years fixed by the Income Tax Law and to get public subsidies.

Although these fiscal benefits are no longer applied, we still find several fiscal advantages that favor the use of fertilizers and agrochemicals in the VATL and the development of agricultural activity in the PPTL, regardless of how the fertilizer is managed. In the first case, we find a reduced rate of 10.5% for the application and final import of fertilizers and agrochemicals, when the general rate is 21%.¹⁰⁶ In the second case, we find a tax exemption for rural

¹⁰³ Law No. 20628, December 27, 1973, B.O. 22821 (Arg.) (on the Value Added Tax, published on Dec. 31, 1973), ordered by Decree 824/19, December 5, 2019 (Arg.) (published on Dec. 6, 2019).

¹⁰⁴ See VOLPEDO, *supra* note 5, at 108.

¹⁰⁵ See *supra* Introduction and Part III.A.2.

¹⁰⁶ Law No. 20628, December 27, 1973, B.O. 22821, art. 28 (Arg.).

properties.¹⁰⁷ If the idea is to discourage the use of fertilizers and agrochemicals, it is important to eliminate the reduced VAT rate, or reformulate it so that it favors only natural fertilizers, and remove the exemption regulated in the PPT, or modify it so that it benefits only rural properties with responsible handling of fertilizers.

CONCLUSION

The goal of this Article was to evaluate the way in which the Argentine national tax system can help to restore the quality of its eutrophic water resources and to develop normative proposals in that direction. For this purpose, I took advantage of the positive and negative aspects learned from comparative international laws.

Considering the international experience that was analyzed in this Article, the implementation of a new environmental tax involves three main options: (1) levying the manufacture, sale, or import of chemical fertilizers, on the general amount of fertilizer, like Finland, or the specific amount of minerals contained within it, like Austria, Finland, and Sweden; (2) levying the land that is destined for intensive agriculture, like Florida, or (3) levying the underground discharge of such fertilizers, either on the whole discharge or the excess minerals, like the Netherlands.

Although these fiscal measures proved to be effective in reducing the use of chemical fertilizers and recovering water resources, all but Florida's tax are currently abrogated. This situation was motivated by both the fiscal measures having achieved their preestablished goals and by the persistence of economic and legal obstacles. The main setbacks were the competitive conditions of the agricultural sector (Sweden), the pressure of the agricultural sector (Finland, Austria, and the Netherlands), and the high administrative costs of implementation and supervision (Netherlands), as was analyzed in Part II.

The research shows that Argentina is not currently taking advantage of environmental taxation to modify agricultural practices involved in the eutrophic process of its water resources. However, the country has different tax alternatives to prevent and reverse the eutrophication of its water resources through environmental taxes and ecological fiscal benefits that could effectively modify farmers' behavior.

In this sense, I verified that the national tax system has two blocks of complementary methods to modify certain agricultural practices and

¹⁰⁷ Law No. 23966, August 1, 1991, B.O. 27201, art. 28 (Arg.).

recover the quality of the eutrophicated water resources. On the one hand, it is possible to increase the tax burden on intensive agricultural activity by implementing a new tax or modifying the current ones. On the other, it is possible to reduce the tax burden that directly or indirectly affects those farmers who use fertilizers responsibly by implementing new fiscal benefits or eliminating those that send taxpayers the opposite message. However, in my opinion, the best fiscal strategy is to start fixing ecological fiscal benefits that encourage good agricultural practices, removing at the same time the fiscal benefits that promote activities linked with eutrophication, and then moving on to environmental taxes with a gradual increase of the tax burden.

Regarding the implementation of new taxes, I suggest a levy be established on rural properties where intensive agricultural activities are carried out, differentiating the rate according to how fertilizers are applied, or a tax on the manufacture, sale, or import of artificial fertilizer minerals, rather than levying the underground discharge of fertilizer minerals. That is probably the reason why I did not find other fiscal examples except the Dutch case.

Regarding the modification of current taxes, I propose to increase the VAT burden, which fixes a reduced rate on the application and definitive import of fertilizers and agrochemicals, and the PPT, which exempts rural real estate, by removing the fiscal benefits of both taxes or keeping them for only certain natural fertilizers that do not generate eutrophication (VAT) or for rural properties that demonstrate responsible and sustainable use of fertilizers and agrochemicals (PPT).

In this sense, the international legal experience taught five important lessons to increase the success of the fiscal measure. First, every analyzed tax strategy helped to reduce the use of chemical fertilizers, but taxing the underground discharge of fertilizers is much more expensive for the government and taxpayers (Netherlands). Second, when a tax levies the manufacture, sale, or import of artificial fertilizer minerals, it is much more effective to charge the minerals of the fertilizers than the fertilizers themselves (Finland, Sweden, and Austria). Third, the progressive increase of the tax burden helps the taxpayer to be better prepared for facing the charge (Finland, Austria, and the Netherlands). Fourth, one of the best solutions to avoid the obstacle of competitive conditions (Sweden) is for several countries to agree to implement similar regional taxes on fertilizers, like Argentina did through the MERCOSUR. Fifth, it is ecologically recommendable to use the collection derived from the tax on fertilizer to recover the

water resources and finance ecological programs to educate farmers to use fewer chemical fertilizers or replace them with natural ones (Florida). Creating an emphasis on environmental education would help taxpayers to accept the fiscal measures and would legitimize the new environmental taxes.

The fiscal strategy I am proposing here could also be useful for other countries whose water resources are suffering eutrophic processes because this ecological phenomenon is much more common (especially in the United States)¹⁰⁸ and serious¹⁰⁹ than we used to think.

Regarding the implementation of new tax benefits, I suggest their use to lighten the tax burden of current (Income Tax), new (taxes on companies' rural properties), or modified taxes (VAT and PPT) that affect intensive agriculture in Argentina. The last option is easier to apply, so I recommend the elimination of the reduced VAT rate, which benefits the application and definitive importation of fertilizers and agrochemicals, and the exemption of the PPT, which applies to all rural properties of natural persons or undivided inheritances.

In short, Argentina has not adopted any environmental taxation measures to modify agricultural practices involved in the eutrophic process of its water resources. Nevertheless, the country has the possibility to change this trend right now by implementing new fiscal measures or modifying the current ones in line with my legal proposals supported by international legal experience. However, time is pressing, and it is necessary to act as soon as possible.

¹⁰⁸ See Selman & Greenhalgh, *supra* note 7, at 2.

¹⁰⁹ See ARELLANO-AGUILAR, *supra* note 3, at 7.

