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ARTICLES

The State of the Argentine Environment: An Overview

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I. Introduction

This paper is designed to provide a backdrop against which a discussion of a framework law for environmental protection in Argentina can occur. This overview of Argentina's environmental problems highlights some pressing concerns that are of interest to human and economic health and may help assess the urgency of taking effective remedial action.

While ecologists observe that the environment is an interacting whole that should not be examined in segments,[1] this article ignores that tenet in the interest of organization. For the purpose of description, the Argentine environment has been divided as follows: Part II addresses one of the major environmental concerns of most Argentines, water quality; Part III looks at a regional problem in the metropolitan areas, air quality; Part IV covers the loss of native forests and the influence of tree farms; Part V presents an overview of agriculture and soil productivity; Part VI addresses wetlands; and Part VII discusses biodiversity issues and wildlife trade.

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1. ROBERT E. RICKLEFS, ECOLOGY 3-4 (3d ed. 1990).

II. Water Quality

The high peaks of the Andes force the Pacific winds to give up most of their moisture before reaching Argentina. For this reason, most of Argentina is comprised of semi-arid to arid land.[2] In these areas, the supply of fresh water is scarce and must be protected. The Province of Mendoza, one of the driest, has adopted the country's most advanced environmental regulations to protect its scarce water supply to ensure that there is a sufficient amount for all sectors of society.[3]

Due to rising populations and increasing industrial activity, many regions of Argentina, especially the Province of Buenos Aires, are confronting serious problems of contaminated water supplies.[4] In these areas, mostly near and in large cities, fresh water is usually not safe to drink.[5] Municipalities rarely have the equipment necessary to treat sewage before it enters water bodies.[6] Industries generally have little incentive to incur the cost of treatment facilities for treating their effluent.[7] The inevitable result is that most of Argentina's water systems, both superficial and subterranean, have become contaminated.[8]

In the city of Buenos Aires, all of the underground aquifers have been depleted.[9] Thus, the last remaining water supply for Buenos Aires is the Rio de la Plata.[10] It is formed

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2. Alejandro Rubén Vila & Claudio Bertonatti, *Situacion Ambiental de la Argentina, Recomendaciones y Prioridades de Accion*, BOLETIN TECNICO NO. 14, at 3 (Fundacion Vida Silvestre Argentina, Buenos Aires, Arg. May 1993) [hereinafter *Situacion Ambiental*].

3. *Environmental Role Models*, APERTURA 24 (Special Envtl. Ed. Jan. 1994).

4. *Buenos Aires' Last Major Water Source Said Threatened by Industrial Pollution*, 18 Int'l Envtl. Rep. (BNA) at 687 (Sept. 6, 1995) [hereinafter *Last Major Water Source*].

5. *Id.*

6. Interview with Pablo Conevari, Humedales para las Americas, Fundacion Ambiental y Recursos Naturales of Argentina, in Buenos Aires, Arg. (July 21, 1995).

7. *Last Major Water Source*, *supra* note 4.

8. *Situacion Ambiental*, *supra* note 2, at 30.

9. *Last Major Water Source*, *supra* note 4.

10. *Id.*

by the confluence of the Paraná and Uruguay Rivers to create one of the largest estuaries in the world.[11] Thousands of factories located in this watershed are dumping large quantities of industrial chemicals that eventually end up in the Rio de la Plata.[12] Without stricter enforcement of anti-dumping laws, the thirteen million residents of Buenos Aires are in danger of losing their primary water supply.[13]

A recent report on the status of Argentina's water supply highlights the lack of basic systems.[14] The study shows that 45% of Argentines have no running water and rely only on water considered to be of "unreliable quality," and 70% have no access to sewer systems.[15] Limited access to sewer systems creates a potential for direct contact between water contaminated with human wastes and freshwater sources.[16]

The dumping of raw sewage is the cause of many problems in the Paraná River Basin and the Uruguay River.[17] Discharging raw sewage causes eutrophication[18] which results in population explosions of algae and other microbes.[19] The sewage, a slurry of dissolved nutrients, acts as

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11. *Id.*

12. *Id.*

13. *Last Major Water Source*, *supra* note 4.

14. *Report Underscores River Contamination from Lack of Basic Water Sewage Facilities*, 17 Int'l Envtl. Rep. (BNA) at 326 (Apr. 6, 1994) [hereinafter *Report Underscores River Contamination*].

15. *Id.*

16. *Id.*

17. *Id.* The Uruguay River is also contaminated with iron, magnesium and phosphates. *Id. See also* Lawrence J. Jensen, *Environmental Regulation in Latin America: A Rapidly Changing Legal Framework*, 8 NAT. RES. & ENV'T 23 (1993).

18. Eutrophication is the process by which a body of water acquires a high concentration of nutrients, especially phosphates and nitrates. These typically promote excessive growths of algae. As the algae die and decompose, high levels of organic matter and the decomposing organisms deplete the water of available oxygen, causing the death of other organisms, such as fish. Eutrophication is a natural, slow aging process for a water body, but human activity greatly speeds up the process.

HENRY WARREN ART, THE DICTIONARY OF ECOLOGY AND ENVIRONMENTAL SCIENCE 196 (1993).

19. RICKLEFS, *supra* note 1, at 252-53.

a fertilizer for these microscopic aquatic organisms.[20] The large populations of microbes consume large amounts of oxygen, creating a hostile environment for other aquatic organisms.[21] As a result, industries such as fisheries are severely affected by eutrophication.[22] The cost saved by not treating the waste is passed onto that part of society which can no longer use the water system.[23]

Many Argentine water bodies contain high concentrations of heavy metals, bacteria, nitrates, and hydrocarbons at levels that are dangerous to humans.[24] The Bermejo River, located between Bolivia and Argentina, is contaminated with the byproducts of oil exploration and refineries in the area.[25] The Paku and Surubí fish, which the locals depend on as their primary source of protein, are threatened by this pollution and development along the banks.[26]

Sedimentation from poor agricultural practices is also a serious problem in many water systems.[27] These particulates and contaminants render a valuable and productive resource unusable for drinking and fishing. Some of these river systems are well adapted to disturbance and may recover quickly if the dumping of human and industrial waste is halted.[28] However, water systems that are contaminated

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20. *Id.*

21. *Id.*

22. *Id.*

23. TOM TIETENBERG, ENVIRONMENTAL AND NATURAL RESOURCE ECONOMICS 313 (2d ed. 1988).

24. *See Argentina and Bolivia Sign Agreement Calling for Joint Cleanup of Bermejo River*, 17 Int'l Envtl. Rep. (BNA) at 269 (Mar. 23, 1994). *See also Report Underscores River Contamination*, *supra* note 14.

25. *Argentina and Bolivia Sign Agreement*, *supra* note 24.

26. *Id.* The Paku, a flat fish that only eats fruit which falls from river-side trees, are near extinction because of human development along the river banks. *Id.*

27. *Situacion Ambiental*, *supra* note 2, at 21.

28. *See, e.g.*, Stuart G. Fisher, *Succession in Streams*, *in* STREAM ECOLOGY 10 (James R. Barnes & G. Wayne Minshall eds., 1983). Since river systems are subject to disturbances caused by variable water flows, they have the natural ability to recover after a polluting event. *Id.* The ability of a river system to recover from pollution depends on the type of pollutant, the flow of the river, and the condition of the river before the discharge. *Id.* Depending on these factors, a river system may recover quickly or slowly. *Id.*

with heavy metals and other persistent toxins will not recover so quickly[29] and may be very difficult and costly to remediate.

Public awareness about the critical condition of the water supply has put pressure on the government to act.[30] The Interamerican Development Bank (IDB) has set up a program with municipalities along the Reconquista River to begin cleanup programs.[31] The funds will be used to create a legal framework for environmental protection, to locate and prosecute parties who are responsible for contamination, to create methods of deterrence, and to draft new environmental projects to be financed by IDB in the future.[32]

III. Air Quality

Generally, the levels of contaminants in the air exceed the locally established standards.[33] Argentina's local air quality standards allow higher levels of contaminants than international standards permit.[34] Since 1985, the amount of SO_2 in the atmosphere has increased 140%, whereas CO_2, NO_2 and particulates have increased 60%, 56% and 100%, respectively.[35] Air pollution from automobiles, which are not subject to emission controls, produces a substantial amount of greenhouse gases. Although Argentina is not considered a very contaminated country, the large number of people living in cities with poor air quality will create health problems in the future. For example, in the city of Cordoba, 200 to 453 cases of respiratory illness are treated a week.[36] The benefit of not installing filters and upgrading equipment is reduced operating expenses; however, the cost of that benefit is transferred to the public in the form of increased medical

29. C.R. TOWNSEND, THE ECOLOGY OF STREAMS AND RIVERS 10-12 (1980).
30. *Argentina Gets $180 Million from IDB With the Bulk To Go to Reconquista River Cleanup*, 17 Int'l Envtl. Rep. (BNA) at 483 (June 6, 1994).
31. *Id.*
32. *Id.*
33. Grisel Isaac, *Alerta Verde*, CLARIN Apr. 16, 1995, at 8-9.
34. *Argentina: Alerta Rojo*, Empresa & MedioAmbiente 61-63 (Special IUCN Ed. Jan. 1994).
35. *Situacion Ambiental*, *supra* note 2, at 30.
36. *Id.*

problems, decreased agricultural activity, and a lower quality of life.

Argentina is also faced with the dilemma of minimizing the destruction of the ozone layer. The World Bank's efforts to encourage the use of hydrochlorofluorocarbons (HCFCs) in place of chlorofluorocarbons (CFCs) has drawn fire from environmental groups.[37] They claim that HCFCs also cause harm to the ozone layer, whereas hydrofluorocarbons (HFCs) do not.[38] However, HFC is considered a greenhouse gas which does not deplete ozone, but contributes to global warming.[39]

IV. Deforestation

Argentina has seven different regions of native forests.[40] Since 1914, two-thirds of those native forests have been destroyed.[41] Urban and agricultural pressures have caused the destruction of one million hectares of forest per year.[42] Argentine forests are used for hard woods, tannin, fence posts and telephone poles, lumber, pulp and for the production of coal (carbón).[43] If this destruction continues unchecked, all of Argentina's native forests will be gone by the year 2024.[44]

Although large areas have been planted with trees for commercial use, the species used are often not native trees. Tree farms are not substitutes for the lost habitats caused by deforestation of native forests because they do not provide a similar environment for forest animals and plants.[45] The new exotic species may threaten the long term health of na-

37. *Program Director for CFC Phase Out Raises Concerns for Greenpeace Unit*, 18 Int'l Envtl. Rep. (BNA) at 117 (Feb. 8, 1995).

38. *Id.*

39. *Id.*

40. Selva Misionera, Yunga, Bosque en Galería del Paraná, Bosque Subantártico, Parque Chaqueño, Monte Espinoso, Parque Puntano-Pampeano. *Situacion Ambiental*, *supra* note 2, at 16.

41. *Id.* at 15.

42. *Id.* at 17.

43. *Id.*

44. *Situacion Ambiental*, *supra* note 2, at 17.

45. RICKLEFS, *supra* note 1, at 763. Forest organisms need a dynamic forest to survive. Dead and dying native trees offer food and shelter to many organisms. Forests are composed of many different species of trees, shrubs and her-

tive forests.[46] Once exotic species are introduced, they often out-compete native species because the exotic species do not have any natural predators in the new habitat.[47] Native animals and other forest organisms are adapted to live off the native trees and will not flourish in tree farms composed of exotic species.[48]

V. Agricultural Land/Soil Productivity

Two-thirds of Argentina is considered arid and semi-arid.[49] These areas are more sensitive to intensive agricultural use.[50] The replacement of native forests and other natural communities by agricultural use or development must recognize the sensitivities of these areas. Careless land use practices in these sensitive areas endanger 75% of Argentina's land.[51]

As agricultural development spreads, so do problems such as desertification and pesticide contamination.[52] Inadequate flood controls and improper land use practices have resulted in wide-scale erosion. For example, in the Pampas, where 89% of the country's grain is produced, modern agricultural techniques have led to a decrease in soil productiv-

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baceous plants and they are spread out in somewhat random format. This biological and spatial diversity in turn supports a diverse animal community.

Commercial forest farms are composed of a single species of trees, and they are planted close together; therefore, tree farms often do not create a forest-like habitat because they are planted too closely, creating sterile monocultures. So, although the tree farms may be a good alternative to chemical-intensive agriculture, they should not be seen as a substitute for native forests. *Id.* at 766-67.

46. RICKLEFS, *supra* note 1, at 460.

47. Laurel Murphy, *Strangers in Paradise*, 46 NATURE CONSERVANCY 29 (Jan.-Feb. 1996).

48. *Id.* at 29-33.

49. *Situacion Ambiental*, *supra* note 2, at 21.

50. RICKLEFS, *supra* note 1, at 195.

51. *Situacion Ambiental*, *supra* note 2, at 21.

52. *See United Nations Environment Programme General Assessment of Progress in the Implementation of the Plan of Action to Combat Desertification*, Report of the Executive Director, UNEP/GC.12/9, 1989 WL 449870 (Feb. 16, 1984).

ity.[53] Traditional crop rotations are being replaced by the use of efficient farm equipment and agricultural chemicals.[54] Generally, these new techniques are more burdensome on the land, leading to increased soil erosion and release of agricultural chemicals into the environment. In Patagonia, cattle grazing and the increased use of monocultures have combined with strong winds to produce desertification that will be difficult to reverse.[55]

VI. Wetlands

In Argentina's arid climate, wetlands are critical areas that not only provide habitats for all kinds of plants and animals, but regulate the flow of river systems to minimize the extent and occurrence of floods.[56] The Pantanal, a Nebraska-sized wetland shared with Brazil and Paraguay, decreases the risk of catastrophic floods in the Paraná River by absorbing the overlap of high waters from both the Paraguay and the Paraná.[57] This wetland is threatened by a major project to make the Paraguay-Paraná waterway commercially navigable.[58] Because both the waterway project and the Pantanal are crucial to this area, the costs of losing this wetland and the benefits of the waterway should be carefully scrutinized to ensure sustainable use of an important resource.

VII. Biodiversity and Wildlife Trade

The trade of animal skins has been an important industry in Argentina since the colonial times.[59] The legal trade of Argentine wildlife oscillates between $50-100 million a year,

53. *Situacion Ambiental*, *supra* note 2, at 20. Monocultures in the Pampas lead to degradation of irrigated soil through irrigation. Often the water used for irrigation is high in dissolved salts and minerals which stay in the soil after the water is used. *Id.*

54. *Situacion Ambiental*, *supra* note 2, at 20.

55. *Argentina: Alerta Rojo*, *supra* note 34, at 63.

56. ENRIQUE BUCHER ET AL., HIDROVIA: UN EXAMEN AMBIENTAL INICIAL DE LA VIA FLUVIAL PARAGUAY - PARANÁ 1 (Wetlands Americas, 1993).

57. *Id.* at 12.

58. *Id.* at 1.

59. *Situacion ambiental*, *supra* note 2, at 18-19.

and illegal trade is estimated to be equivalent.[60] The revenue generated by this industry makes it a very important component of the overall economy.[61] Unfortunately, federal regulation is based on market demand, not on sustaining the resource for long-term use.[62] Needless to say, this approach does not promote the sustainable use of a socially and economically important resource.

VIII. Conclusion

Argentina, like other Latin American nations, is presently confronted by serious environmental problems and exploitative practices that threaten its natural resources and its citizens' health. Poor agricultural techniques have lead to the degradation of soil productivity and water contamination.[63] Short-sighted fishing practices and inadequate surveying has lead to the deterioration of fresh water and marine resources.[64] Poor management of forest resources has lead to fires destroying hundreds of thousands of hectares.[65] Against these problems, and the others described in this article, as Argentina emerges economically, it must foster sustainability through a legal system that promotes environmental preservation and protection.

60. *Id.* at 19.
61. *Id.*
62. Claudio Bertonatti, *Diagnóstico del Comercio de Pieles en Argentina*, Presented at the Third International Congress of Furriers, in Buenos Aires, Arg. (June 13-15, 1995).
63. *Argentina: Alerta Rojo*, *supra* note 34, at 62-63.
64. *Situacion Ambiental*, *supra* note 2, at 26-28.
65. *Argentina: Alerta Rojo*, *supra* note 34, at 62-63.