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After NAFTA: Institutional Ways to Create Environmental Assessment Services and Technological Development in Mexico

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Abstract

A basic requirement of NAFTA and the NAAEC side agreement is that the country of Mexico will have to make a major effort to correct a wide variety of environmental problems to fulfill its obligations under those agreements. As described in this manuscript the existing system for monitoring and correcting problems could be improved, providing an alternative to resolving environmental problems. It is believed that creation of a large cadre of university students, trained to look for non-traditional solutions to complex environmental problems, will have a major impact upon correcting Mexico's environmental problems. This paper describes how such a program functions in the state of Iowa, and how its counterpart program in the State of Baja California, Mexico was developed, and will function beginning in the fall of 1994.

Resumen

Una necesidad básica del TLC y del Acuerdo Bilateral de Cooperación Ambiental de América del Norte (NAAEC) es que México tendrá (que hacer un mayor esfuerzo para corregir un gran número de problemas ambientales y así satisfacer las obligaciones adquiridas bajo esos acuerdos. El sistema de monitoreo y corrección de problemas ambientales que se describe en este manuscrito puede mejorarse, siempre y cuando se proponga una alternativa para resolverlos. Se piensa que la creación de un grupo de estudiantes universitarios, entrenados en la búsqueda de soluciones no-tradicionales para los complejos problemas ambientales, puede tener un importante impacto en la corrección de estos problemas en México. Este trabajo describe como funciona este tipo de programa en el estado de Iowa y como se desarrollo la contraparte que comenzó a funcionar en el otoño de 1994, en el estado de Baja California, México.

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Passage of the North American Free Trade Agreement treaty is now history, and that great sucking noise referred to by Ross Perot has quieted, but controversy remains about the present and future implications of the treaty, particularly with respect to the environmental impact area. There is reason to be concerned because the environmental record, both of Mexican companies and foreign companies who operate in Mexico, is not good. The border between Mexico and the United States has been viewed as an expanding environmental danger zone in which the creativity of improper industrial toxic disposal is matched only by the deteriorating state of the local residents' health. Examples of the frontier pollution border on the horrendous. Deaths of infants, due to complications from drinking contaminated water, (a witches brew of fecal matter and toxic chemicals from industrial plants) runs into the thousands *Interviewee* (A), May, 1993). Many companies avoid regulatory requirements because the proliferation of chemicals from so many sources complicates prosecution.

Approximately 2 300 industrial plants have been built along the United States-Mexico border during the past 23 years (SEDECO, 1996). They are known as Maquilas which arc foreign production facilities established on the border. Maquilas use cheap Mexican labor to produce finished products which are then shipped back to the United States duty free. Because of limited enforcement of environmental laws, many of these factories contribute to a toxic slew that has come to characterize, perhaps symbolize what the Maquilas mean to Mexico's poor who work in and live around those facilities —the provision of subsistence living wages in exchange for life in a hazardous waste dump. in Baja California there have been built 800 Maquiladoras, 36% of the total in Mexico (SEDECO, 1996).

The end result of laisser faire regulation of Maquilas is that "...sewage and toxic waste from Tijuana flows in California blighting beaches." *(Business Week,* July, 1992). However, the city of San Diego, California which borders Tijuana, also pipes its waste into the ocean but at 4 miles out to sea to a discharge depth of about 320 ft; the average discharge for 1993 was 187 million gallons per day (MGD) with a maximum of 364 MGD (City of San Diego, 1993). The waste has been detected at San Quintin , Baja California, some 200 miles South of San Diego *Interviewee* (B), May, 1993), so that both cities are guilty of improper sewage disposal.

The cost to remediate the border environment has been estimated to exceed five billion dollars, and the U.S Environmental Protection Agency (EPA) asked for $240 million from the U.S. government (as of 1993) while Mexico allocated $460 million for the 1993-1996 period *(Business Week,* July, 1992) to fund clean up projects. Although, the combined total far from completely finances the remediation, the situation is beginning to be addressed, and it is expected that future funding by both sides will be more generous. In addition, Mexico began a crackdown on Maquilas and other industry in 1992. One of the government's most effective means of dealing with polluters has been temporary closing of plants which violate Mexico's comprehensive environmental laws.

To comply with Mexican environmental laws, passed in 1988, factories are required to make contract audits to prove that they are meeting the standards. Companies are allowed to hire private labs to do audits. Unfortunately what too often happens is best expressed by Enrique Medina, an industry consultant, ‘’1 get lab reports from many companies that are terrible. 1 would

say that 90% of the company-generated information that Sedesol (Sedesol now named Semarnap - Diario Oficial de la Federación, 28 December 1994- is the Mexican equivalent to the U.S. EPA) has is inaccurate. You cannot do enforcement with inaccurate information." *(Wall Street Journal,* September, 1993).

Lax enforcement of Mexico's environmental laws has been a concern of environmentalists in both governments. A 1992 study by the U.S. General Accounting Office (GAO) reinforced that concern. "The GAO audited six new Maquiladoras and found that none had complied with the Sedesol requirement of an environmental-impact assessment before starting operations. Further the GAO reported it was told such non-compliance is widespread." *(Wall Street Journal,* September, 1993).

While the overall picture of compliance with the law is discouraging, there are some signs that Mexican industry may, if only out of self-interest, comply with the laws. Veronica Callahan reports that some companies in the border city of Ciudad Juarez have begun self-policing by "organizing audits of each other before the Sedesol troops come in. *(Wall Street Journal,* September, 1993). But self-policing in any country has the potential for compromise.

A major problem in carrying out the auditing function is the limitations of staff and equipment. The Wall Street Journal, reports that the Mexican State of Queretaro has only one government inspection office responsible for monitoring over 1 000 domestic and foreign companies. The office is staffed by two university interns and a teenage secretary, who is paid with work study credits *(Wall Street Journal,* September, 1993). Furthermore, both industry and government are very suspicious of each other. Government officials arc justly suspicious of self-monitoring while companies resist efforts by government inspectors feeling that they may be heavily penalized for infractions of the law even when they have a serious effort to comply with it.

To resolve this concern by both Mexican and U.S. Officials, the North American Agreement on Environmental Cooperation, or NAAEC, (the so-called NAFTA environmental side agreement) went into force in January, 1994. NAAEC focuses on the specific action of environmental violations affecting trade agreement with Mexico. In effect, the NAAEC "was created out of the recognition that a severe gap exists between the Mexican environmental laws in theory and the enforcement of those standards." (International Environment Reporter. December, 1993) NAAEC levies monetary penalties to countries which fail to comply with their domestic agreement and subtracts NAFTA trade benefits when participants fail to pay their fines on time.

Enforcement of the NAEEC agreement is accomplished through the creation of a Commission for Environmental Cooperation (CEC), which consists of a council, secretariat, and joint public advisory body. The council is the governing body with the primary responsibility to develop recommendations for punitive actions against violators. There are two procedures directed towards different end results. The first resolution process is through consultation and recommendation. "When a party feels compelled to bring proceedings against another party, the former can initiate 'consultation' as the first step toward reaching a 'mutually satisfactory, non-binding resolution of the matter." (International Environment Reporter, December, 1993) Working through this process, the council recommends how the parties may resolve their dispute. If this mediating process fails, then penalties can be imposed through a second process. This is done through an arbitral panel and allows the panel to

penalize the offending party if a violating party has not complied to resolution of the mater.

The panel has discretion to consider the extent and time period involved in determining the fine, and is allowed some flexibility in determining the size of the penalty. Penalties are monetary and, as defined in the agreement can be initially assessed for no greater than $20 million (U.S.) and thereafter should be no greater than 100% of the total trade between the two disputing parties. If the sanctioned party does not pay the fine within six months, the violating party's NAFTA benefits may be suspended "in an amount no greater than that sufficient to collect the original fine." (International Environment Reporter, December, 1993).

Other element of the agreement allows non-governmental organizations (NGOs) and individuals to submit alleged failures of a party to comply with environmental laws. Rut to confirm the allegations requires an extended bureaucratic procedure that ultimately allows no recourse on the form of fines. While lacking enforcement, this procedure does allow individuals and NOGs to be major watch dogs for offenders, particularly since, unlike the arbitral panel process, there is no requirement that violation of environmental laws be related to trade. The watch dog potential of this law, particularly in combination with a "green law" passed in the state of Baja California (which includes the city of Tijuana) can *be* a potent vehicle for enforcing the environmental laws by both citizen groups and the NAAKC.

A major weakness of the NAAKC is that it does not have the authority to initiate investigations on its own and instead has to rely upon complaints brought by individuals, NGOs, and the NAFTA states. However, the positive side of the citizen focused initiation process is that Mexican citizens are becoming more militant in monitoring corporate behavior. For example, in a study on the behavior of environmental organizations in the city of Tijuana it was found that over 20 Mexican organizations in the Tijuana Metropolitan area are monitoring the activities of local industry (Bustamante Rosi, Fall, 1992). This "greening" of the Mexican citizenry continues to expand, and its effectiveness is increased as these local organizations link with counterpart agencies in the United States.

The foundation of the regulatory model being developed in Mexico is its reliance upon an adversarial relationship between industry and citizenry. In the United Sates, such an approach has become an institutionalized tradition and the courts are replete with environmental lawsuits. Consequently, Mexican colleagues of ours believe that the most enthusiastic groups supporting both NAFTA and the NAAEC are the Mexican law firms who are eagerly anticipating the judicial fallout as NGOs and individuals pursue companies who violate the environmental law.

Given Mexican industrial reluctance to allow control and direction by federal regulating bodies (let alone international regulating bodies) a win-win solution that will allows industry to operate within the law without being penalized, and will provide a technical and advisory service, which allows industry to correct violations before a punitive governmental audit takes place, would seem to be an effective means to being resolving some of the environmental problems in Mexico particularly within the border area of Mexico and the United States. This process could be aided through the adoption and implementation of an advisory approach which is used in the sate of Iowa to help small industry understand and comply with environmental laws. 'The remainder of this paper will discuss the Iowa program and

its counterpart which has been created in the state of Baja California, Mexico.

The Iowa and Baja California Reuse/Waste Reduction Programs

In August 1992, the University of Northern of Iowa (UNI) and the Autonomous University of Baja California (UABC) signed an exchange and research agreement for faculty and students. Environmental studies was the priority area for which both universities would cooperate. Especially relevant to that focus was the fact that beginning in 1988, UNI developed and implemented a waste reduction center with an articulated outreach service for the sate of Iowa.

Through a series of organizational meetings beginning in the summer of 1993, a joint committee was established with the task of uniting the administrative and technical forces of both universities to create a counterpart reuse/recycle/waste reduction program in Mexico. After exchange visits by staff from both universities and the Rector of UABC the decision was made to proceed with the development of the programs in the Ensenada campus of the Autonomous University of Baja California (UABC has four branch campuses: Ensenada, Tijuana, Tecate, and Mexicali). A major operational task was to adapt the outreach system to the Mexican cultural milieu, and begin training people to serve in the various outreach functions.

To understand how the UABC program will function, it is necessary to have an understanding of how the Iowa program works. The following section will give a brief history of the development of the Iowa program.

The Iowa Waste Reduction Center (IWRC), which received legislative approval in early 1988, is based on a simple operating philosophy —to confidentially provide the means to small business to control and properly dispose of hazardous materials. The intent is to correct the situation without getting into costly and time consuming punitive action by state arbitrators. Properly trained technicians provide the outreach to serve those companies, as well as the autonomy to provide information on regulatory violations independently of state environmental auditing agencies.

Walking this tightrope wasn't easy in the beginning as companies were suspicious about the confidentiality agreement. But within a year, a basic trust was established between the companies and the center largely through the integrity of the field agents and director of the center. Over 1 000 companies have been served at this point in the history of the center.

The primary vehicle for working with industrial clients is the interactive and technical skills of the outreach field agents. The process by which they work with clients follows a traditional extension agent approach. Specifically, field agents from ((IWRC) are contacted by small business clients who feel they may have an environmental violation problem. An appointment is made to have a visit by the field agent. Upon arrival the agent explains the confidential nature of the assessment, assures the client that the assessment will not be given to sate or federal regulatory agencies, and asks the client to sign a document acknowledging that he/she understands the nature and outcomes of the assessment process. The agent then tours the facility with the client, makes the observations necessary to gain an understanding of problems or potential problems, and reviews these findings with the client.

Upon return to the IWRC, the agent writes an official document of the assessment indicating what, (if any) environmen-

tal concerns were found, what needs to be done to correct those concerns, and what sources of technical aid are available to help the client resolve any problems. The confidential nature of the assessment is reiterated, and the client is invited to set up another visit or contact the agent for clarification. The client then decides what further action to take independently from the IWRC.

Funding for the IWRC and its field agents is provided by landfill tipping fees. It required six years of legislative effort before the IWRC was funded (in large part due to the opposition of environmental consultants), and one can expect some resistance to funding such a program through legislation in Mexico. However, since Mexico is a one-party democracy, it is quite possible that long-term funding may proceed more quickly (under federal guidance) if pressure from the United States forces Mexico to honor its commitment to clean up its environmental problems in accordance with the NAAEC legislation. Recognizing the need to get long-term support, efforts to gain political support for the program are being made. However, initial efforts are concentrating on demonstrating an effective pilot program managed by the UNI and UABC.

Technical development of the program began in October, 1993 with a visit by members of the coordinating committee. Subsequently, a series of exchanges involving job training of Mexican counterparts at the IWRC at UNI and followup visits by Iowa counterparts to Ensenada, Mexico, has resulted in the development of the program at Ensenada to the point of routine operation beginning in September, 1994.

At this time, the UABC program has a director, an administrative coordinator, and two special project coordinators All have been trained in the field operation process, and have been carrying out the ancillary function of contacting local business and state and government officials, promoting the program, and selecting and training advanced level students who will serve as outreach agents for the program.

Utilizing advanced students for field work certainly has monetary advantages to it, and is multipurpose in nature. Mexican universities require all students to fulfill 300 hours of community service before graduation. Students who work in the outreach program will actually be accomplishing three tasks: providing free outreach labor, fulfilling a volunteer commitment, and positioning themselves for a career with opportunities that will only continue to expand as the cleanup of the border area continues.

The strategy for the training of the field agents, once the initial team has been trained, and has performed its service, is to use the outgoing team in a training-the-trainee approach. The long-range intent is to create a cadre of young people who will have both the technical training and experience, as well as the proper attitude, towards resolving the environmental problems that affect both Mexico and the border. It is anticipated that such a core of young people will have a positive effect upon the resolution of environmental problems as they move onward in their careers and communities.

In addition, a technology transfer function utilizing innovative, low-tech, appropriate solutions to environmental problems is being integrated with the program. The goal is to demonstrate that the socially motivated community service volunteer commitment of Mexican university students can be mobilized to provide effective low-cost, appropriate solutions to environmental problems. The final section of this manuscript will give examples of how the Mexico program will use low-cost appropriate technology

approaches to resolve complex environmental problems.

Low-Cost Appropriate Technological Ways of Solving Environmental Problems

A philosophy of reuse/recycle is that waste in the proper context is a resource. Used motor oil, for example is a product that has the potential to be a resource. Thrown indiscriminately on the ground or into the sea, it may contain carcinogens that contaminate surface waters. Used properly to resurface roads or be refined into motor oil or diesel fuel, it is considered a resource for new products.

Throughout Mexico, disposal of used motor oil has been unregulated. In the Ensenada area, the traditional practices have resulted in contamination of the and and the sea, and must be resolved quickly. Fortunately, the solution is not technologically complex.

One of the first appropriate technology transfer projects between UNI and UABC involves environmental education as a vehicle to create a waste oil recycle program. In combination with the UABC undergraduate program, students will canvas the Ensenada metropolitan area describing the nature of the waste problem, conducting demonstration exhibits at a local science museum, and talking to children in the public school system on why oil disposal is an environmental threat that must be resolved. Through the reuse program contractual agreements are being made to collect and sell properly analyzed and classified waste oil to the road maintenance department and to the national oil company to be reprocessed. Subcontractors (individual collectors) will be paid 10 cents a gallon for each gallon of used oil collected. In a city of 200 000 people, a wide variety of internal combustion engines produces over 1 000 gallons of used oil a day which, if handled solely by individual collectors, could provide wages for 25 people (the minimum daily wage is four dollars a day). While large producers of oil might collect and transfer used oil themselves, one can see that, in addition to making a useful product out of waste, collection and disposal can be done in manner that also provides jobs.

The concept of appropriate technology for developing countries (which often means substituting low-cost labor for high cost capital technology) is particularly relevant to this kind of environmental problem. Collecting and reprocessing a waste in a country like the United States is often viewed as too costly when the high cost of labor negatively affects me monetary return of the product. However, in a developing country, substitution of low-cost labor, particularly so, in a labor intensive process such as collecting waste materials, promotes the profitability of the operation and creates jobs.

In the UABC program, two sources of *no cost/low cost* labor are available: the community service hours of students to be used in environmental education and promotion and the low cost of labor for the implementation of appropriate technological solutions to recycling and waste reduction. These two institutional factors will pay an important role in developing solutions to another unique problem: the development of sewage disposal systems in areas where infrastructure is either nonexistent or impossible to finance.

Municipal sewage treatment has been a major problem affecting both Mexico and United States. To address the Mexican side of the problem, “a new plant for Tijuana that could handle 25 million gallons of sewage a day...” (Business Week, July, 1992) were proposed and is now under construction with a cost of 200 million dollars, and it is expect will be in operation

at beginning of 1997 (CILA, 1997). Unfortunately, that "doesn't include funding to link the half of the city that isn't hooked up to sewage pipes." (Business Week, July, 1992). In the city with population that exceeds two million people , this translates into a sewage program that affects only half of the population. *The* use of capital intensive secondary sewage treatment is a traditional way to treat waste, but in a poorly planned city it has cost, as well as technical and physical limitations (many of the city's shanty towns are perched on hillsides and in gullies).

There are, however, low-cost, low technology solutions for physically demanding disposal sites. For example, plans for low-cost composting toilets have long been available from the Peace Corps and VITA offices. With a subsidized compost toilet program coordinated and administrated by university students, the total cost would approximate half of the operating and maintenance fees of the proposed capital intensive system for one year (estimated to be $9 million). Consider that estimated cost equals $30 per composting toilet, so 166 666 households of six people (one million people) times $30 equals 5 million dollars. Then use the money for no-interest loans to participants in a revolving fund and provide the opportunity for people to build or purchase composting toilets, with help of students run assistants.

The price for a border area secondary sewage treatment plant, according to the San Diego Union Tribune, will be over $239 million with an annual operating cost of $9 million to $10 million *(San Diego Union Tribune,* April, 1994). This will serve only half of the city of Tijuana, excluding the other one million people. Realistically, not including the other half of the city will not solve the problem, for not treating the sewage wastes of one million people would mean that a very bad problem will only be half as bad after the new treatment facility is built. 78% of the Tijuana population use the sewage of the city of the Grijalva Palomino I., 1997).

Add the investment of $5 million for a composting toilet program in a total investment of over $250 million (less than 2% of the cost of the sewage facility), and you have the opportunity to develop a program that will actually contain the problem. A composting toilet program could be done on a loan basis with students being the collection agency.

So the individual payback for a toilet may only be $1 a year and some individuals may cheat, it is nevertheless conceivable to think that over a ten year period most of the money would be repaid, and that the system would be transferred to residents of new "colonias", using the repaid money in a revolving fund. There are a number of scenarios on how such a program could be developed and administered by student community service labor The point to be made by this example is that an organization whose philosophical and operational base goes beyond traditional environmental solutions offers the potential of being able to develop alternative solutions that are more appropriate and effective for the culture and environment of the people it serves.

In the context of a less developed country both the uniqueness of problems, and the difficulty of acquiring finances to resolve problems requires innovative inquiry into the development of solutions. Training students to look at problems in terms of non-traditional approaches is no more difficult than training students in dogged acceptance of traditional approaches. It does, however, require instructional commitment to insure that the training of graduates follows the philosophical base of a non-traditional solution development.

The UABC/UNI program provides this kind of training for Mexico's unique en-

vironmental problems. Through a planned format of involving as many students as possible in the training program, it is anticipated that a large cadre of graduates, trained to look for non-traditional solutions to complex problems will be created, and ultimately have a major impact upon the country.

Concluding Remarks

A basic requirement of NAFTA and the NAAEC side agreement is that the country of Mexico will have to make a major effort to correct a wide variety of environmental problems to fulfill its obligations under those agreements —if not for the basic health of its citizens. As described in this manuscript the existing system for monitoring and correcting problems could be improved.

The Iowa Waste-Reduction and Reuse/Recycling Centers, provide an alternative to resolving environmental problems, and the current replication of those models with an outreach program to Mexican small business(s), should help in correcting existing difficulties.

But the long term effort involves creative use of low-cost, appropriate solutions to problems that do not necessarily follow the traditional rules created by developed countries. In addition to the obvious benefits of providing regulatory assistance to small business through the program's out reach, it is believed that creation of a large cadre of university students, trained to look for non-traditional solutions to complex environmental problems, will have a major impact upon correcting Mexico's environmental problems.

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