Environmental Degradation and Migration
The U.S.-Mexico Case Study

The Natural Heritage Institute

In ECSP Report *Issue 3, we published the initial findings of the Natural Heritage Institute's (NHI)* U.S.-Mexico Case Study on Desertification and Migration. *Following is a detailed account of the conclusions and recommendations to policymakers from NHI's final report entitled* Environmental Degradation and Migration: The U.S./Mexico Case Study. *This report presents the findings of a four-year investigation led by Michelle Leighton of the NHI, a nonprofit, public interest environmental organization. NHI seeks to broaden understanding about the interrelationship between the social, economic, demographic, and natural resource management-related determinants of transnational migration.*

Determining the root causes of migration has become the focus of official investigations in North America. Mexican and U.S. agencies agreed in 1994 to study jointly the causes and consequences related to cross-border migration. Their effort lacks analysis of the environmentally related causes of migration. Our report, the culmination of an investigation since 1993 on the U.S.-Mexico case study, seeks to fill this gap in analysis and to provide a framework for policy reform. We are pleased that the U.S. Congressional Commission on Immigration Reform has incorporated certain key findings and recommendations from our report into its official Congressional report of September 1997. Importantly, it too urges Congress to consider the environment and development root causes of migration in establishing its foreign policies related to Mexico and other countries. NHI's findings, provided in this report, can serve as a beginning point for further official debate and action on the issue.

NHI is undertaking several activities in follow-up to this work, including an analysis of U.S. bilateral assistance in the environment and development areas, focusing first on USAID programs in Mexico and how these may be improved through greater integration and targeting. NHI also co-hosted a workshop with the Environmental Change and Security Project at the end of June which brought together officials and nongovernmental organizations to consider the implications of these findings in the global context of environment and development issues, and their implications for U.S. foreign policy and bilateral assistance.

Conclusions and Recommendations: Policy Reform and Program Development

The goal of NHI's investigation has been twofold: First, we wish to provide a better understanding of what is becoming an increasingly apparent and significant root cause of Mexican migration: rural land degradation or desertification. Second, we hope to demonstrate how official programs, initiated at local, national, and binational levels, can begin to address this problem more concretely. Our study indicates that environmental phenomena and associated population and migration flows cannot be addressed through short-term fixes initiated by the United States, such as additional border security and employment-related sanctions. Rather, official and private, or non-governmental programs within Mexico to address these problems is warranted. The United States can play a catalyzing role for these reforms through binational, cooperative programs with Mexico's private and public sectors. As discussed below, the United States has technology and expertise that can serve in facilitating these programs. To date, these opportunities have been little advanced beyond the physical border area.

It is anticipated that the following conclusions and recommendations can serve as a framework for the development of cooperative programs between Mexico and the United States in the areas of research and official and private program development. This section is accordingly divided into two categories: Potential for

---

Project Director Michelle Leighton is Senior Legal Counsel and Director of International Programs at the Natural Heritage Institute. To obtain copies of the report or for further information, please contact The Natural Heritage Institute, 114 Sansome Street, Suite 1200 San Francisco, CA 94104.

U.S. Action and Opportunities for Policy Reform. The latter is related to specific programs on environment, agriculture, and community development.

A. Potential for U.S. Action: Policies and Programs

I. Cooperative Programs

Our findings demonstrate a strong correlation between land resource degradation, poverty among rural households, the lack of capacity to farm, and migration both within Mexico and across the U.S. border. The pervasive deterioration of lands in Mexico in the rural drylands should be viewed as an important contributor to migration flows (whether seasonal or permanent). Yet, U.S. policies and programs related to Mexico do not address this problem in an integrated fashion. Most programs, both private and public, seek to address only one facet of the problem, such as deforestation and loss of biodiversity in Mexico. Some of these have begun integrating population-related issues but only in a few circumstances. Generally, community development issues are targeted through unrelated channels and carry different priorities and agendas from those related to environmental preservation. The link between these issues and the policy of reducing rural migration, where it is considered at all, is often more rhetorical than a factor influencing program development.

U.S. bilateral assistance and funding from private foundations generally follows this pattern. U.S. policies and programs related to migration or *immigration* similarly do not readily consider the root causes related to environment or population trends. Most of the U.S. immigrant policy initiatives center on the physical border area. Yet, opportunities exist for binational program development in all of these areas. Our findings suggest that targeting official program development and assistance in a more innovative and integrated fashion may not only yield positive results for environment and community development in Mexico, but may prove a more sound long-term investment in reducing migration than those focusing solely on prescriptions along the border.

The recommendations in this report are not meant to serve as a panacea for all migration, environment and development problems noted. Rather, they are meant to serve as a framework for debate on policy reform. Given the scarcity of bilateral resources, cooperative U.S.-Mexico programs should address improved rural development and agricultural productivity. In terms of assuring improvements in land degradation, poverty, and migration, this can be considered on two tracks: 1) the new migration-emitting states with extensive marginality and poverty, substantial soil erosion problems and, in some cases, high population growth rates: Oaxaca, Puebla, Veracruz, Tabasco, Campeche, Yucatan, Quintana Roo, and Chiapas. This is warranted because raising the rural income in these areas may have a significant impact on migration;[1] and 2) the states or regions where migration is already well-established. These areas will require significant investment in scope and magnitude in order to have enough of an impact to compete with the opportunity costs of migration in those sending areas.[2] Specific opportunities are discussed in Section B, below, related to areas for policy reform.

As a jurisdictional matter, there are several opportunities for U.S. binational program development along these lines. For example, in 1997 the Memorandum of Understanding (MOU) between SEMARNAP (Mexico's environmental agency) and the U.S. Department of Agriculture was amended to include a framework for cooperative cross-border program development to address forest and soil management issues, including desertification. Joint program development under this MOU should be strongly supported by the United States, particularly as the Department of Interior's Bureau for Land Management, and U.S. Department of Agriculture's Natural Resource Conservation and Forest Services have extensive experience in dryland management issues and can provide a wealth of technical and institutional expertise in cooperative programs undertaken between Mexico and the United States. Funding has not been provided for development yet. Agencies in both countries should identify collaborative action programs within this framework. Another immediate opportunity is for the United States to ratify the U.N. Convention to Combat Desertification and Drought. That Convention also provides a substantive framework within which both countries and nongovernmental organizations can develop action plans. Mexico has already ratified. U.S. leadership on the treaty could ensure that the United States works more closely with Mexico in Mexico's development of land management programs, perhaps emphasizing attention to migrant-emitting states with high desertification rates, such as the southern states of Mexico.

2. Integrating U.S. Environment, Population, Migration Policies

As noted earlier, current U.S. programs and policies address environmental, population and migration problems separately as a matter of foreign policy. For example, though these program areas are housed within Global Affairs at the U.S. Department of State, there is little practical or programmatic integration of these issues. The U.S. Ambassador to Mexico has indicated these interrelated problems are critical for U.S. foreign policy. [3] Too, Mexico's agencies with the separate mandates of protection of natural resources, im-

provement of agriculture, population initiatives, and migration have traditionally not considered how best to address such integrated issues. President Zedillo's "Alliance for the Countryside," discussed below, may be a start. The following discusses potential reform of U.S. policies and programs as a beginning point for addressing the issues that touch upon U.S. foreign policy interests.

One example of where inter- or intra-agency coordination in U.S. policies and programs can be better targeted in addressing these issues is with regard to the U.S. Agency for International Development (USAID). In reviewing program work in Mexico, for example, USAID programs in population, economic development, and the environment do not address the relationship between land degradation, population, or migration problems. In fact, they appear not to address migration. One reason may be that migration issues are sensitive or, in some cases, highly controversial as related to cross-border foreign policy. Nonetheless, there is little in USAID programs presently that seeks to address the environmental issues of agricultural land degradation in dryland areas. The environment program is focused on climate change and biodiversity, two important programs to say the least, but which, without linkages to agricultural dryland management issues, will do little to address the significant problems identified in this report. The economic development program similarly does not address land degradation in rural areas which is contributing to low agricultural productivity and marginilization of rural drylands. Education programs supported by USAID also lack reference to these issues. Population programs are being cut entirely, though there USAID is now requesting an extension to the year 2000.

Part of the problem appears to lie in the fact that within the USAID bureaucracy there is a clear separation between agricultural programs and environmental programs. As the Mexico case study illustrates, unsustainable agricultural land management can lead to severe soil erosion and deforestation, or clearing of lands for additional grazing or crop cultivation. This affects the quality of both land and water resources. Yet, the separation of these programs tends to support the separation of projects to address these issues and within the Mexico program there are now no agricultural land management issues targeted for funding except as ancillary efforts of a few biodiversity projects.

Moreover, there is no concerted vision to utilize U.S. funding programs to target areas in Mexico where environmental improvement and education may serve to improve community development and limit growing levels of out-migration. Given the limits of urban infrastructure to assimilate rural migrants in many of Mexico's fastest growing cities, this is a critical issue for the Mexican government. It could serve as a foundation for U.S.-Mexico cooperation. In sum, there is an urgent need for better integration of U.S.-sponsored policies and programs, both in terms of foreign policies and assistance. Agencies could begin with a serious review of how current programs and policies can be better integrated.

3. *Uses of Remittances for Improving Local Development and Institutional Capacity*

One innovative means by which the United States can catalyze environment and development initiatives to reduce migration may be through the use of remittances, which now total anywhere between $1.5 and 4 billion depending on which statistics you use. According to International Monetary Fund figures, for example, remittances to Mexico totaled $4.3 billion in 1995 and $40 billion between 1975 and 1990. Remittances can enhance the productivity of land use by reducing poverty[4] and overcoming market and institutional failures and lack of investment in public goods. The large scale of such transfers makes the use of these funds a potentially potent opportunity to improve rural land management development, and to reduce migration. This potential has been largely untapped.

For example, the United States and Mexico can do more to reduce the cost of transferring remittances to Mexican rural areas, though these transfers are generally handled through private, rather than official, channels. Currently, these transfers are in small amounts, less than $300, and there are high fees to sender and recipient usually associated with these transfers, often as much as 20 percent of the amount transferred.[5] This means that nearly *$1 billion* per year of the IMF's estimated remittance transfers is used to pay transfer fees. An innovative program between the United States and Mexico could seek to facilitate reduced transfer fees where funds were invested in community programs that would improve local development and environmental assets. Given that much rural development depends on agricultural productivity and marketing, the incentive program could be combined with bilateral programs making investment in agriculture more attractive (such as by price policies that do not discriminate against agriculture), or alternatively, encouraging the development of local entrepreneurial businesses. Channeling remittances toward local investment may decrease poverty by creating employment in emitting communities, thereby reducing incentives to migrate.[6]

4. *Support for Research That Can Identify Solutions in an Integrated Fashion*

There is an immediate need for research on the environmental causes and consequences of migration—particularly in rural agricultural regions of Mexico. Most of the research on migration to date has focused

largely on sectoral issues—e.g. research on agricultural productivity has not traditionally focused also on related environmental degradation, such as deforestation, or on contributors to migration, such as lack of education or family planning programs. This in turn has led to policies that do not approach these problems in an interrelated fashion. The inverse is also true—when programs to arrest deforestation are implemented, they do not readily integrate issues of community development. We have observed that this dynamic is beginning to change. Further research will help identify opportunities for integrated programs on the field level, and can suggest how best to harmonize policies and programs at the national or binational level.

The further development of methodologies for integrating environmental, population pressure and migration predictions is of particular importance in addressing the issues of poverty and migration among Mexican farmers and laborers. Data show that environmental stress variables are of significant importance because they can create incentives to migrate. Population pressure on the *ejido* population and the increasing rate of deforestation may also result in increased migration. Policies targeting the amelioration of environmental stress and population pressure on the land could play pivotal roles in reducing incentives to migrate to the North. If implemented properly, they would work by retaining migration.

B. Opportunities for Policy Reform and Program Development

1. *Environment and Agriculture*

a. *Promoting Improved Land and Water Management Practices*

Our findings demonstrate a strong correlation between land resource degradation, poverty among rural households, the lack of capacity to farm, and migration both within Mexico and across the U.S. border. The pervasive deterioration of lands in Mexico in the rural drylands should be viewed as an important contributor to migration flows (whether seasonal or permanent). Though research is not conclusive in documenting the number of people migrating, the Mexican government has estimated that somewhere between 700,000 and 900,000 people a year are leaving rural dryland areas which are threatened by or undergoing desertification processes (processes of soil erosion).[7] The high levels of marginality,[8] low levels of education, and continued population pressures in rural areas also play a role in this dynamic.

This suggests the need for improved and more widespread education and training programs in the rural areas, including but not limited to programs to improve agricultural management practices, soil conservation, and water use. There is also a need to promote the use of good fertilizers, high yield seeds, and a substantial variety in crops. Emphasis should also be placed on the reduction of water intensive dry land crop cultivation and substitution of drought resistant crops in areas where salinization is a problem, and where the land and climate can support some form of cultivation. Development of incentive programs to support transition to water conserving irrigation systems is also warranted. Conservation serves to protect scarce water supplies which are critical in arid areas, particularly central and south Mexico; in the north, replacing inefficient systems could reduce salinization of land and water resources by limiting the application of water which tends to mobilize salts naturally present in soils.

The Mexican government has undertaken efforts in many of these areas, including its establishment of a Soils Conservation Service in 1995 within the natural resources agency, SEMARNAP. One effective area for the new Conservation Service is a farmer to farmer training program in which successful small farm management is documented and demonstrated to other small farmers. Unfortunately, soils conservation education and training programs now receive little financial and political support. The new conservation agency should be strongly supported by the Mexican government and, where appropriate, U.S. programs developed in cooperation with Mexico in this regard. One area in need of immediate attention is the development of an environmental monitoring system which allows for continued information gathering and analysis of social and economic impacts in rural areas. This could serve as an early warning system for areas most critically affected by environmental and socio-economic changes.

There are other opportunities. Capital flows into Mexico are increasing with the likely result of an appreciation of the peso and a decrease in the real farm price of corn, thus creating more poverty and displacement among smallholders who are net sellers of corn.[9] To circumvent these effects, modernization of agriculture and crop diversification among these producers should be promoted.[10] For modernization to be successful there should be investments in infrastructure and institutional reconstruction.[11] Displacement may be avoided by the use of *Procampo* transfers (this is the program which pays small land owners a certain amount per hectare to support investment in agricultural modernization and diversification) as opposed to sustaining household consumption. For this to occur, the transfer of financial resources should be timely relative to the liquidity needs for agricultural production and be accompanied by technical assistance.[12] An additional option may be to develop access to off-farm complementary sources of employment that can be accessed without abandoning a part-time farming activity.[13]

b. *Improved Forest Management and Land Tenure*

Most of the Mexican forests, many of which are threatened by over-harvesting, are located on *ejido* land, where much of the property is communal and cooperation with other communities in forestland management has been problematic. This lack of cooperation has led to overuse of land, including overharvesting and soil erosion. One solution may be to direct policy efforts at resolving property rights on these lands and effectively manage common property resources.[14] Part of this solution must include continued regulation of forest management and improved enforcement of laws/policies.[15] According to some experts, adequate forestland management requires trained, equipped personnel who can utilize integrated and multipurpose forestry products and which involves local communities or local nongovernmental organizations.[16]

2. Population and Rural Development

a. *Population and Other Demographic Initiatives*

Research indicates that population trends in growth and movement in Mexico's rural areas are correlated with poverty and land degradation, particularly in *ejido* communities. Population pressure on natural resources, measured by the rate of deforestation are important determinants of migration. Reducing this pressure should be part of efforts to reduce migration at the source.

Given the scarcity of good farmland in Mexico and the large size of the farm population, increasing the productivity of labor in farming offers a limited solution. It may be more important to focus on the development of decentralized non-farm activities. Specifically, activities which lead to greater decentralization away from the border and the main cities of the benefits created by NAFTA in labor intensive manufacturing are warranted. As with development strategy, balancing protection of the environment with project development initiatives will be critical to preserving Mexico's natural resources.

In addition, more in-depth research of the correlations between population trends and migration is warranted to quantify this contribution and identify more concretely the extent to which population growth leads to further subdivision of and pressure on lands. Deforestation may well be a symptom of population pressure,[17] though some argue that it is the inverse. The Mexican government has succeeded in reducing population growth rates, though the rates still remain quite high in rural areas and in indigenous communities may often reach a figure double the national average. Education programs need to be expanded to the more remote rural areas. These programs can require long maturation periods in order to achieve long-term results and require a longer-term commitment of resources. In Mexico, these programs may be subject to greater volatility related to the Presidential cycle. Budgets for such programs are not as robust as they will need to be to effectively address this problem. Moreover, USAID efforts to address population problems are being canceled. U.S.-Mexico cooperative programs in the population area should be revisited to determine how integration of these programs with other environmental and economic development programs can serve to address the root causes of migration identified in this report.

b. *Community Development Initiatives*

Poverty, which in rural areas is exacerbated by the inability to productively farm, or by the farming of marginal lands, is an important factor in the decision to migrate. Municipalities with high levels of marginality also have high rates of migration, indicating that the lack of local opportunities and poverty are important determinants of migration. Community development programs established in rural areas should focus on the reduction of crop cultivation where the soil and/or climate are unsuitable for cultivation and the institution of controlled grazing practices. Moreover, it is recognized that there is a need for employment creating new investments to expand from the border area into the interior regions of Mexico. Many of the benefits created by NAFTA in labor-intensive manufacturing have been focused on the border and some have called for more aggressive efforts to attract development further south.

Small producers face the threat of displacement by more competitive farmers due to land titling reforms that may create a market where only the most competitive landholders will succeed.[18] While this may not be undesirable in terms of pure economic theory, it is likely to have a tremendous impact on migration—there is likely to be a surge in migration out of the rural agricultural areas as this economic transition takes place. Improved farming productivity from soils conservation and related programs may not only result in better environmental resource management, but allow, where appropriate, for a slower and more equitable transition toward an ultimately more urbanized Mexican society. Moreover, soils conservation and agricultural training can be directed at the marginal and subsistence producers to increase substainability of their livelihood and reduce involuntary migration.

In the longer-term, both financial institutions and producers' associations should be created for smallholders in order to enhance smallholder competitiveness and fill the void that remittances are currently filling in providing access to financial liquidity and sources of insurance.[19] To achieve this, there should

be an increase in the profitability of investment in labor intensive agricultural activities. One avenue is through the cultivation of fruits and vegetables that acquire competitive advantage in the context of NAFTA. Most of rural central/southern areas of Mexico remain highly dependent on extensive corn/ maize production, and transition would take some considerable effort, financially and otherwise. This high "front end" investment may provide more-lasting long-term benefits. Too, this would require public investment in infrastructure (irrigation and roads), and organizational and institutional development of these areas so that farmers can invest profitably in agriculture. In addition, developing financial institutions on both sides of the border that will channel remittances to the emitting areas and make migrants' savings available for borrowing by other community members with investment plans, would also help create employment.[20]

The Mexican government has recognized the need for implementation of substantial efforts to address rural development. In 1995, Mexico created "Alliance for the Countryside" to address socio-economic problems affecting the agricultural sector. It comprises the following Secretariats: SAGAR, Hacienda y Credito Publico, Comercio y Fomento Industrial, Reforma Agraria, Desarollo Social, SEMARNAP and Trabajo y prevision Social. The Alliance's general goals are to increase the income of agricultural producers and agricultural production to a level above population growth, produce sufficient basic foods for the population, promote the export of products from countryside, preserve natural resources and increase rural housing. These policies are to be implemented by facilitating access to new technologies, promoting the inflow of capital into the countryside, and improving human resources through training. There are 64 initiatives proposed by many different agencies in the Alliance but it is uncertain which are being undertaken. Our investigation revealed agency funding cuts have led to little improvement, especially for natural resources and agricultural management programs.[21]

In addition, Mexico's National Development Plan (1995-2000) includes a three-point plan established by the Mexican National Science and Technology Council, in association with SEMARNAP, to improve soil management as follows:

1) conduct a national soils inventory (currently underway);

2) develop new soil legislation to revise legislation as appropriate, including connecting property and usufruct rights with the responsibility of conserving and restoring the soil, and develop soil management and restoration standards with the aim of producing clear standards that protect investments while maintaining a low level of bureaucratic red tape; and

3) persuade agricultural producers to modify their management practices to better assure sufficient income and sustainability of soil resources.

The government has yet to make substantial funds available for these reforms. However, there is much that can be done in terms of training campesinos, civil servants and governmental and non-governmental promoters.

As a final note, many of the needed initiatives discussed could be further catalyzed by U.S.-Mexico cooperation and assistance. These opportunities are described above in the section on Conclusions and Recommendations. Importantly, NHI's findings suggest that targeting program development and assistance in rural environmental and agricultural settings, in association with public or private localized programs, can serve as a potentially potent investment in reducing migration. This will not be a daunting task as both private and official institutions in the United States possess environmental resource and agricultural expertise that can be utilized in approaching cooperative program development with counterpart institutions in Mexico. Nongovernmental organizations on both sides of the border have already begun to work together on these issues. Official leadership is needed to move beyond these initial efforts. We strongly urge exploration of these issues and opportunities by Congress and the Administration.

Endnotes

1 Areas where migration is well-established have already lowered their transaction costs of migration making the opportunity costs of migration much greater (A. de January report, Appendix, p. 16). The newer areas have not yet reduced the transaction costs of migration (Id., p. 16). Consequently, rural development efforts in the newer areas may have a greater impact in reducing migration: improved development opportunities could effectively compete with the opportunity costs of migration (Ibid., p. 16).

2 See Appendix 1, p. 16.

3 Internal Communiqué from U.S. Ambassador Jones to the White House, U.S.. Department of State and other federal agencies, January 1997 (on file with the Author).

4 Ibid., p. 6.

5 Information was provided by several commentators on this, including in written comments of Professors Philip Martin and David Myhre, Fall 1997. Professor Martin has identified that for a US $300 transfer, Western Union charges 10% and on the Mexican side, Electra exchanges the money into pesos at a very high rate.

6 Appendix 1, p. 16

7 See discussion in earlier sections of this report.

8 Marginality is measured by CONAPO at the municipal level through an index that eight low levels of education, poor housing conditions, high percentage of the population in communities of less than 5000 inhabitants, and a high incidence of households in poverty.

9 Appendix, p. 17

[10] Ibid.
[11] Ibid.
[12] Ibid.
[13] Ibid.
[14] Ibid., p. 16.
[15] Ibid.
[16] Written comments of Hector Arias, Cideson, Sonora, Mexico, to NHI September 8, 1997. One problem he notes is that large consortia of timber companies exploit the resource. Yet, the lands are owned by local individuals or ejidos and the local people bear the responsibility for reclamation at a practical level. As reclamation is generally expensive and requires training; it is often not undertaken effectively.
[17] Ibid.
[18] See Appendix 1 pp. 16-17.
[19] Ibid.
[20] Ibid.
[21] Some have criticized these programs. Paredes Rangel, General Secretary of the National Campesina Federation, indicated that the most important aspects of the program were technology transfer and training (1995); Mazon-Rubio, President, National Agriculture Council, is concerned that the subject of stable income was not addressed and proposed that a follow-up schedule to deal with pending issues be created (1995); for Bonilla-Robles & Gonzalez Quiroga (1995), land ownership issues were of paramount importance; to Bonilla-Robles & Gonzalez Quiroga (1995), land ownership issues were of paramount importance; to Bonilla-Robles (President, National Federation of Small-plot Owners: rural credit and commercialization issues are important; Gonzalez Quiroga has indicated that rural training programs sponsored by institutions have yet to reach rural areas. Programs are needed that will generate rural jobs and maintain sale prices of agricultural products above production prices. Rural credit programs are not working and the rural sector needs the government to guarantee loans so that producers with un-paid debts will be eligible for new loans. Un-paid debt is far from being resolved. New monies should not be used by just a few individuals or by the banks themselves, but instead should be managed fairly.

Dialogue, The Wilson Center's Radio Program
Discussing Environment, Population and Security

Dialogue, the Wilson Center's award-winning radio program, explores the world of ideas and issues in national and international affairs, history, and politics. Broadcasts are hosted by George Liston Seay, public and international affairs specialist, and feature weekly conversations with renowned scholars, authors, and public figures. Several shows have been devoted to discussing environmental issues, and the following broadcasts can be purchased through Public Radio International:

Broadcast 137: **"The Politics of Conservation"**

Douglas Weiner, Assistant Professor of History at the University of Arizona in Tuscon
Saving the world's resources is undoubtedly a good thing. Yet in the past some groups have used environmentalism's positive goals to advance less honorable political notions. Douglas Weiner, scholar and environmentalist, discusses environmental decisions and their unavoidable political consequences.

Broadcast 283: **"Environment and Security"**

P.J. Simmons, Director, Environmental Change and Security Project, Woodrow Wilson Center
The world's environmental crisis continues apace. In emerging nations of Eastern Europe and in the developing regions of Asia and Africa armed conflict abounds. New strategic thinking suggests a linkage between these phenomena, and a new discipline joining environmental and security concerns is being developed. P.J. Simmons describes the actors and factors in what may be a 21st century strategic theme.

Broadcast 235: **"The Population Challenge"**

George Moffett, Diplomatic Correspondent, *Christian Science Monitor*
During the 1970s the world's crisis of population growth was widely noted and debated. Then, as public attention shifted to the worldwide economic crisis of the late 1980s and the political upheaval of the early 1990s, population issues seemed almost to disappear. George Moffett, Diplomatic Correspondent for the *Christian Science Monitor*, argues that the crisis is more threatening than ever. He describes its dimensions and suggests solutions.

For Information: Karen Reid, *Dialogue*, (202) 287-3000 extension 325 and Richard Ruotolo, Public Radio International (612) 330-9252; Email: radiodial@aol.com; Web: http://wwics.si.edu/. For a cassette copy of programs, listeners may call Public Broadcast Audience Services at (303) 823-8000.

Solving China's Environmental Problems: Policy Options from the Working Group on Environment in U.S.-China Relations

by Aaron Frank

The People's Republic of China (PRC) is becoming an increasingly important player in international affairs, given its staggering 1.2 billion population, growing military and economic power, and ability to affect regional stability in Asia and important global issues. The United States realizes that it needs Beijing's cooperation to achieve regional and international objectives, yet many contentious issues continue to strain the U.S.-PRC relationship. Environmental issues, however, have the potential to serve not only as a building block for U.S.-PRC cooperation but also as a model for how the United States will engage other developing nations with similar environmental problems. As Michael May asserts, "How the existing powers, most of all the United States, engage China is likely to have a profound effect on the perceptions which India, Pakistan, Indonesia, and many other countries in and outside the Asian continent will have of the options open to them and on the assumptions they will make about what the U.S. role in their growth will be" (May, 1997).

While U.S. engagement with China is multifaceted, environmental issues have become a core component of improved relations. As demonstrated by a multitude of cooperative agreements between the United States and China on science and technology issues, the environment has developed into an area of flourishing success in U.S.-China relations.

However, China's environmental difficulties continue to grow at alarming rates. China is the second largest emitter of greenhouse gases (the United States is first and has much higher per capita emissions than any other country), and its emissions are growing while those of most developed countries are either stabilizing or decreasing. Inefficient and "dirty" coal accounts for 75 percent of Chinese energy production, contributing to serious urban air pollution throughout China. According to the World Bank, at least five of the nine most polluted cities in the world are Chinese and 500 major cities in China do not meet World Health Organization (WHO) air quality standards (Mufson, 1997; *China Environment Series*, 1997). Air pollution in Beijing is six times worse than in New York City, and while Beijing has only one-tenth the number of automobiles as Los Angeles, its automotive emissions are almost as great (Mufson, 1997; World Bank, 1997).[1] Acid rain, stemming from the burning of China's high sulfur coal, causes $2.8 billion of damage to China's forests, agriculture, and industry every year (Hertsgaard, 1997). Other environmental concerns such as water quality and quantity, biodiversity loss, and food security are also reaching critical levels in China. Declining conditions have had measurable impacts on the health of Chinese citizens and economic growth.[2]

To address these important concerns and debate strategies for engagement with China on environmental issues, the Environmental Change and Security Project created the Working Group on Environment in U.S.-China Relations in November 1996. While at first concentrating on energy issues, monthly Working Group meetings have also included discussions on water quantity and quality, financing mechanisms for environmental protection, and biodiversity issues. Water issues were considered of utmost importance to the Chinese and will impact Chinese agricultural output, economic growth, and urban water supplies. Future Working Group sessions will address food security and population. Working Group discussion repeatedly returned to the themes of multilateral cooperation, domestic Chinese environmental issues with significance for the United States, and impediments to cooperation on U.S.-led projects within China. Working Group meetings have also produced

---

Aaron Frank is Project Associate at the Environmental Change and Security Project and Coordinator of the Project's Working Group on Environment in U.S.-China Relations. The views expressed in this article are those of the author and a variety of Working Group members and do not represent an official opinion or position of the Woodrow Wilson Center.

numerous engagement strategies for U.S. policymakers, and highlighted the context in which these strategies could be implemented.

I. The Working Group on Environment in U.S.-China Relations

The Woodrow Wilson Center's Working Group on Environment in U.S.-China Relations, coordinated by the Environmental Change and Security Project in partnership with the Center's Asia Program, is an ongoing multidisciplinary forum for discussion of environmental and foreign policy concerns. The aims of the Working Group are to: (1) identify the most important environmental and sustainable development issues in China and discern how those issues relate to U.S. and Chinese interests; (2) develop creative ideas and opportunities for government and nongovernment cooperation on environmental projects between the United States and China; and (3) discuss how environmental issues can continue to be a building block in improving U.S.-China relations.

The Working Group has had particular success in drawing upon the expertise of its over forty members, which include government, NGO, academic, and private business representatives. Working Group speakers have represented a broad mix of backgrounds, ranging from China scholars to government officials and World Bank representatives. Working Group meetings are co-chaired by Elizabeth Economy of the Council on Foreign Relations and P.J. Simmons of the Carnegie Endowment for International Peace, and are held on a not-for-attribution basis.

Small group sessions of the Working Group concentrate on more specific topics of interest and have included visits by Qu Geping, Chairman, Committee on Environmental Protection and Natural Resources Conservation, National People's Congress; and the Citizen Involvement in Environmental Protection Delegation from the People's Republic of China.

II. Main Themes of Working Group Discussion

During the first six months of Working Group discussion, the following three strategies were identified as key to engaging the Chinese on environmental issues.

A Clearly Defined and Articulated China Policy

The relationship between the United States and China is complex; while progress has been achieved on many issues in recent years, others still raise considerable tension. Changes in both U.S. and Chinese policy (such as the linking and then delinking of human rights to trade on the United States side, and the differing levels of aggresion towards Taiwan on the Chinese side) have created corresponding fluctuations in the warmth of U.S.-PRC relations. It is not unreasonable for the Chinese to view U.S. policy as a seesaw which balances itself according to pressures from Congress, the public, or the media. To combat this Chinese perception and to enhance domestic credibility on relations with the Chinese, many Working Group members argued that the most important action the U.S. government could take would be the formulation of a clearly articulated, coherent China policy with explicit objectives and guidelines by which progress on a variety of issues could be measured. Such a policy was considered to be a means to avoid the public perception that policy changes are the result of economic incentives or "pandering" to Chinese interests.

Financing Mechanisms for Environmental Projects

The Chinese are frequently critical of U.S. government offers of environmental assistance because the United States rarely backs up its promises with strong funding mechanisms. Both the U.S. Agency for International Development (USAID) and its U.S.-Asia Environmental Partnership (USAEP), for example, are restricted from funding projects in China. American businesses with environmental technologies hoping to invest in rapidly expanding Chinese markets express similar discontent; they feel as though they are at a disadvantage vis-à-vis Japanese and European competitors who receive more financial assistance from their governments. This lack of U.S. financial assistance for Chinese environmental problems carries considerable impact; China's environmental markets are estimated at $3.7 billion, with U.S. firms struggling to gain a foothold (*Asia Environmental Business Journal*, 1997).

While removing aid restrictions for China would ease this burden, Working Group members also suggested a number of alternative ways to help improve the current situation:

- Establish accepted international environmental guidelines and minimum specifications for projects funded by Organization for Economic Cooperation and Development (OECD) member countries, development agencies, or international banks. These guidelines would assist in halting large, environmentally unsound projects and would also help provide a level playing field for international businesses proposing projects in developing countries;

- Provide high level governmental support for environmental projects and business ventures in China to show the Chinese that these projects are considered a priority by the U.S. government; and

- Explore the possibilities for multilateral joint commercialization projects. For example, a project could capi-

talize on U.S. technological innovation, Taiwanese or Japanese financing, and Chinese labor to create a demonstration project in China. Transportation projects, such as upgrading China's rail transport system, would most likely provide the best opportunity for such joint commercialization efforts.

A Focus on Local Problems with Secondary Global Impacts

While the Chinese are clearly concerned about the environment, it is equally evident that they are much more concerned about domestic environmental problems (such as urban air pollution and water shortages) than global ones (climate change). This prioritization of environmental issues presents a conundrum for the United States, which places its priority on the global impacts of China's environmental problems, most notably carbon dioxide (CO_2) emissions that contribute to global warming. Working Group members agreed, however, that ignoring China's local environmental problems at the expense of global ones would be a significant barrier to U.S.-PRC cooperation on environmental issues; the U.S. government and NGOs should therefore concentrate on local Chinese environmental problems which have secondary global impacts.

For example, the Chinese will likely be much more receptive to assistance on reducing urban levels of suspended particulates after studies demonstrate the connection between these pollutants and high rates of urban lung cancer. Once the connection is made, assistance—and investment in the technology to reduce emissions—will be more openly accepted by the Chinese. The secondary impact of such emissions reductions would be ancillary reductions in sulfur and CO_2 emissions, thereby reducing greenhouse gases and the prevalence of acid rain.

III. Conclusion

While China's increasing greenhouse gas emissions are of clear importance to the United States, they should not be the only cause for U.S. concern; China's environmental and development choices have the potential to directly impact U.S. interests. Rising health care costs and crop losses due to pollution have the potential to disrupt China's economic growth and food security. Without assistance, the Chinese will be unable to meet their sustainable development—and their economic—goals: China needs support and advanced technology from developed countries to achieve its economic, development, and environmental objectives. Multilateral cooperation and a focus on domestic Chinese environmental issues with secondary global impacts will demonstrate the international concern about Chinese environmental problems while also addressing Chinese domestic environmental priorities. Continued bilateral engagement and cooperation with

Compendium of Working Group on Environment in U.S.-China Relations Meetings

5 February 1997
Chinese Energy Production
William Chandler, Battelle-AISU**; Barbara Finamore,** Natural Resources Defense Council; **Will Martin**, NOAA; **Robert Price**, Department of Energy

26 February 1997
Energy Policy Options for U.S. Decision Makers

5 March 1997
Context for U.S.-PRC Cooperation in the Energy Sector
John Sammis, Department of State; **Robert Sutter**, Congressional Research Service

2 April 1997
Transportation Options and Trends in China
Eva Lerner-Lam, The Palisades Consulting Group; **Julia Philpott**, International Institute for Energy Conservation

7 May 1997
The Chinese Political Economy and Central-Local Government Dynamics; Urban, Township, and Village Air Pollution
Kenneth Lieberthal, University of Michigan; **Hu Min**, Peking University; **Karen Polenske**, Massachusetts Institute of Technology

7 May 1997
Discussion with the Chinese Citizen Involvement in Environmental Protection Delegation

19 May 1997
Dicussion with **Qu Geping**, Chairman, Committee on Environmental Protection and Natural Resources Conservation, National People's Congress

4 June 1997
Bilateral Relations on the Environment: Successes and Failures from the U.S. and Abroad
Richard Louis Edmonds, University of London; **Jonathan Margolis**, Department of State; **Miranda Schreurs**, University of Maryland

2 July 1997
Hydroelectricity and Nuclear Energy in China
Marcia Aronoff, Environmental Defense Fund; **Todd Johnson**, World Bank; **Michael May**, Stanford University; **Robert Price**, Department of Energy; **William Spodak**, Strategic Consulting Alliance; **Barry Trembath**, World Bank

10 September 1997
An Overview of Chinese Water Issues
Frederick Crook, Department of Agriculture; **Daniel Gunaratnam**, World Bank; **Dan Millison**, Ecology and Environment, Inc.; **Susan Ware**, NOAA

1 October 1997
Chinese Fisheries and
International Cooperation on Oceanic Issues
Stetson Tinkham, Department of State;
Zhi Wang, Department of Agriculture

5 November 1997
Hazardous Waste and Urban Water Scarcity in China
Jack Fritz, World Bank; **Ellen Spitalnik**, Environmental Protection Agency

5 November 1997
Reservoir Resettlement in China: World Bank Experience
Gordon Appleby, Economic Development Institute; **Barry Trembath**, World Bank; **Warren van Wicklin**, World Bank; **Thomas Rhyss Williams**, George Mason University; **Martin ter Woort**, World Bank; **Zhu Youxuan**, World Bank

3 December 1997
Water and Agriculture in China, and
Chinese Watershed Management Practices
Dennis Engi, Sandia National Laboratories; **Lee Travers**, World Bank

7 January 1998
Chinese Transboundary Water Issues
Jason Hunter, The Nautilus Institute; **Doug Murray**, National Committee on U.S.-China Relations; **Grainne Ryder**, Probe International

4 February 1998
Summary Session of Working Group
Discussion on Water Issues
Abigail Jahiel, Illinois Wesleyan University; **Jay Stewart**, Ogden Environmental and Energy Services Company; **Changhua Wu**, World Resources Institute

4 March 1998
Financing Environmental Protection in China: Promoting Environmental Technologies and Investment
Eric Fredell, Department of Commerce; **Stephen Hammalian**, SJH Consultants; **Ray Phillips**, ICF Kaiser, Inc.

1 April 1998
Financing Environmental Protection in China:
The Role of Foundations and NGOs
Robert Hathaway, International Relations Committee, U.S. House of Representatives; **Nancy Kete**, World Resources Institute; **Peter Riggs**, Rockefeller Brothers Fund

6 May 1998
Biodiversity in China and the Trade in Endangered Species
Jennifer Haverkamp, Office of the U.S. Trade Representative; ***Susan Lieberman***, U.S. Fish and Wildlife Service; ***Daniel Viederman***, World Wildlife Fund-China

26 May 1998
Environmental Policymaking in China
Wen Bo, China Environment News; **Changhua Wu**, World Resources Institute

3 June 1998
Forest Issues in China
Nels Johnson, World Resources Institute; **Rick Scobey**, World Bank

4 June 1998
China's Electric Power Options: An Analysis of Economic and Environmental Costs
William Chandler, Battelle-AISU; **Jeffery Logan**, Pacific Northwest National Laboratories

1 July 1998
China's Food Security
Lester Brown, Worldwatch Institute; **Linda Wiessler-Hughes**, National Intelligence Council; **Hunter Colby,** U.S. Department of Agriculture

China on environmental issues will facilitate the transfer of American environmental technologies to China and will further support the work of environmental NGOs establishing partnerships and programs in the PRC.

The meetings of the Working Group on Environment in U.S.-China Relations have identified key engagement options while also exploring China's energy sector choices and water-related problems. Working Group members believed that support for U.S. businesses marketing environmental technologies in China should be a priority for the U.S. government. Since the U.S. government is currently unwilling to increase significantly its financial commitments to support environmental protection measures or technology transfers to China, it should attempt to open doors for those who can—namely private firms. In doing so, the United States could help bring environmental remediation technologies and alternative fuel sources to the Chinese while opening markets for U.S. firms and products.

At the same time, the U.S. government and NGOs should support and assist China in developing policy changes in the energy and water sectors, especially through multilateral fora on the environment. Working in tandem with private businesses, NGOs and foundations offer the best external hope for encouraging Chinese sustainable development.

Cooperation on a variety of levels is necessary for water quality and quantity in China to improve. China's water problems are not dissimilar from those experienced in the United States; academic and governmental exchanges could greatly reduce water shortage difficulties by introducing new irrigation techniques and comprehensive watershed management plans. In many ways, China's water problems will be solved more through policy changes than technological fixes.

Through continued engagement and explicit support for environmental projects, the United States can provide a framework within which businesses, NGOs, and foundations can successfully promote Chinese environmental improvements. Such cooperation is vital if the United States aims to effectively assist the Chinese in their economic and environmental development. Only under such a scenario can the United States hope to have a positive influence on future Chinese energy choices and on a Chinese development pattern that is environmentally sensitive for both China and the world.

References

"China: Moving A Mountain in Environmental Changes." *Asia Environmental Business Journal* 5 (Oct/Nov/Dec 1997): 1-5.

Hertsgaard, Mark. "Our Real China Problem." *The Atlantic Monthly*. (November 1997): 97.

May, Michael. "Energy and Security in East Asia." *China Environment Series* 1 (November 1997): 16-19.

Mufson, Steven. "Rising Coal Consumption Makes China a World Leader in Pollution." *The Washington Post*, 30 November 1997, A22.

"Summary of Working Group Discussions on Energy Issues in China." *China Environment Series* 1 (November 1997): 40-66.

The World Bank. *Clear Water, Blue Skies: China's Environment in the New Century.* Washington, D.C.: The World Bank Press, 1997.

[1] In June, 1997 China began phasing out the use of leaded gasoline in Beijing and Tianjin to help reduce automobile emissions. While this policy is unquestionably a move in the right direction, Chinese emissions will continue to increase in the future; automobile ownership in China, for example, expanded from 710,000 in 1991 to 1,500,000 in 1995 (*China Environment Series*, 1997).

[2] The World Bank estimates that 178,000 people in major Chinese cities suffer premature deaths each year from pollution, and mortality rates from chronic obstructive pulmonary disease are five times those in the United States (World Bank, 1997; Mufson, 1997). The World Bank also estimates that air and water pollution damages equaled roughly 8 percent ($54 billion) of the Chinese GDP in 1995 (World Bank, 1997).

How to reach our contributors:

Günther Baechler, *Swiss Peace Foundation*, **spfbaechler@dial.eunet.ch**

Melissa Brown, melissa.brown@worldnet.att.net

Aaron Frank, *Working Group on Environment in U.S.-China Relations*, **chinaenv@erols.com**

Thomas Jandl, *Bellona USA*, **bellona@mindspring.com**

Craig Lasher, *Population Action International*, **clasher@popact.org**

Michelle Leighton, *Natural Heritage Institute*, **mls@n-h-i.org**

Steve Lonergan, *University of Victoria and GECHS Project*, **Lonergan@uvic.ca**

Kirk Talbott, *Conservation International*, **k.talbott@conservation.org**