Incorporating indigenous epistemologies into the construction of alternative strategies to globalization to promote sustainable regional resource management:

The struggle for local autonomy in a multiethnic society

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People develop in direct consonance with their environments and the natural pressures emanating from the ecosystems of which they are a part. This 'animistic' formulation of society finds a complex intertwining of human society and culture that contrasts sharply with the Judeo-Christian traditions that tell of a world in which man was given dominion over the beasts, or, to relate to the images evoked by the ancient epic Tale of Gilgamesh, man was embroiled in the primordial struggle between the kingly civilization and the forests, the source of all evil and brutishness.[1]

This struggle continues even more ferociously in our day, as "civilized" society imposes its desires on subjected peoples around the globe. Although these demands are no longer limited to the taming of the primeval forests and its primitive peoples, many still cherish the idea that technology can harness nature for the benefit of those who are knowledgeable enough to master the planetary forces that have historically limited the advance of humankind. This catechism of social control over nature dominates present-day discussions of the role of science and

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[1] See Sinclair; Andrew. 1991. *The Naked Savage*, London: Sinclair-Stevenson.

technology in the solution of social and economic problems and underpins the wellspring of optimism that guides long-term planning to this day.

In this framework of social and technological superiority it is no wonder that 'primitive' peoples still living in pre-modern societies are dismissed as irrelevant in the search for new solutions. Their collective traditions that often accord great respect to ancestral memories and to elderly keepers of wisdom are poor substitutes for the gargantuan budgets that can be mustered to collect information and specimens, to systematize information and generate new knowledge. Although there is now grudging recognition of the importance of these primitives' ability to discover the myriad varieties of flora and fauna that still inhabit their lands, to identify their characteristics, and to unlock their secrets. Modern corporations are even realizing that this information and these secrets are valuable commodities for solving current-day problems or curing newly identified maladies; they have found that this information may have to purchased, if it cannot be stolen as was the custom in past generations.

Many scientists now recognize that society has carefully cultivated the accumulation of knowledge of the workings of the natural world through the centuries. Scientists in ancient times developed interesting and innovative solutions to complex problems, sometimes guarding them as cherished treasures by encapsulating them in ceremonial cycles controlled by local nobility, by burying them in magnificent public works, or by entrusting them to a priest-like caste. Later, we learned, such knowledge of natural forces and planetary beings was also appreciated by local communities worldwide, codified into religious and lay traditions that were passed on through the ages in sacred texts and by story tellers or keepers of 'the word.'

In recent times, this accumulation of vernacular knowledge has been retrieved by some – anthropologists or ethno-scientists of varying specialties. Some native practitioners have crossed the social lines, training themselves in Western traditions of scientific discovery and technological development, to place their knowledge at the service of other societies. Others have crossed this cultural and political (socio-economic?) line, only to return again to the comfortable folds of their communities, to inject elements of the 'other' into the practice of the traditional. This complex intertwining of cultures and knowledge systems has created concerns about humanity's ability to safeguard all the secrets of the past, as well as the varieties of species that have developed or been cultivated to attend to social and biological needs; these losses, these disappearances, may now threaten our continued existence, as we find ourselves exposed to the fury of new plagues, viruses and bacteria which exact a terrible price on afflicted peoples or natural phenomena that wreak terrible damage in the natural environments on which we have come to depend.

Many scientists have reacted to these changes by insisting on the need to expand our horizons, to incorporate into our knowledge systems and social practices some of the insights inherited from these "pre-modern" sources. A new academic practice is emerging, in which "post-normal science" humbly acknowledges our inherited debt to these numerous traditions.[2] This work has produced a rich cumulus of understanding about the functioning of the world and the ways in

[2] For more information on this work see, for example: Funtowicz, Silvio, et *al*. 1998. Challenges in the Utilisation of Science for Sustainable Development. Commission for Sustainable Development (CSD6). United Nations, NY; Funtowicz, Silvio and Jerry Ravetz. 1993. "Science for the post-normal age." *Futures*, 25:739-755; Ravetz, Jerry. 1996. *Scientific Knowledge and its Social Problems*. New Brunswick, NJ: Transaction Books; Ravetz, Jerry and Silvio Funtowicz. 1999. "Post-Normal Science - an insight now maturing." *Futures*. 31:641-646.

which we might better attend to our own needs and those of the planet without compromising the integrity of either.[3]

In our work in Mexico, we find ourselves collaborating with rural communities who are struggling to escape from the dynamics of social and economic marginality. Like their counterparts elsewhere in the world, many of these peoples are descendents of indigenous communities and peasantries that have been systematically impoverished during the process of modernization and international economic integration. During the more than one-half century since the United States inaugurated its first "development" program (Point IV), the world has become more polarized and more people thrust into the columns of the poor, even as some of the worst manifestations of poverty, such as low life expectancies and high infant mortality, have been reduced.

Existing models of development are creating poverty among the masses. This process undermines the viability of rural communities, with their rich social and cultural traditions that developed productive systems to assure their basic needs. In rural areas, poverty forces people to abandon centuries-old traditions of ecosystem maintenance, because their search for employment often forces them to migrate from their communities. Now there is evidence that if successful rural management strategies are able to assure better living conditions and higher incomes, the rural poor not only will care for the environment, but also will undertake those tasks needed to protect their scarce natural resources (see note 6).

[3] A collection of analytical articles and case studies can be found in: Frey, Scott. 2000. *Environment and Society Reader*. Boston: Allyn and Bacon/Longman. Of course, the World Bank has also produced a considerable body of materials supporting this approach.

Today's problems have their roots in settlement patterns created during the colonial period (16th to 19th centuries). As the invaders expropriated the best lands, indigenous populations found themselves relegated to increasingly marginal ecosystems. These areas were frequently very different from their original places of settlement, and the natives were obliged to pay tribute to their conquerors, when they were not enslaved. These changes were not new, however, as commerce and war were common elements in even the most ancient of societies.[4] After independence, the indigenous groups continued to be pushed to increasing inhospitable and fragile areas, just as colonization schemes transferred peasants to the tropical rainforests.

Rural communities in general and indigenous groups in particular continue under increasing pressure. Their living conditions deteriorated as their production systems demanded more from the land; they produced crops for human consumption on their rainfed lands, developed handicrafts and other artisan products, and raised animals and horticultural products, including hogs, chickens, fruits and herbs, in their backyards. The most fortunate among them were able to protect their access to other natural resources, such as a lake or river for fishing and to meet their water needs and a forest for wood or hunting. Over the decades, they accumulated a rich experience in managing these resources, developing sophisticated management systems that were integrated gradually into their customary practices. They continued trading activities, among themselves and with others, maintaining and modifying their traditions, adapting them to changing conditions, strengthening their communities and their identity, choosing to protect their most cherished values and practices in each historical moment.

[4] Wolf, Eric, 1982. *Europe and the People without History*, University of California, Berkeley.

This process is crucial because it incorporates innovation as a permanent part of social practice, a means to maintain and even to reinforce tradition by enhancing customary practices with new materials and techniques that assure the continuity of social and productive processes. One recent example of a change in productive activities to protect a valued tradition among people in one of the ethnic groups with which the authors are working, is the case of women who decorate cloth (unraveling the threads in attractive ways) to make *huanengos*, a traditional blouse open on the sides. They recently modified their techniques to produce blouses and dresses for visitors, because they noted the demand for their skills for decorating Western styles of clothing, without necessarily modifying the way they dress in their own communities.[5]

Nowadays, many indigenous groups are attempting to exert greater control over their natural resources as well as their economic and political life. The communities are acutely aware of the environmental damage that accompanies most development programs and the toll that these efforts impose on peoples and their ecosystems; for lack of alternatives, they find themselves acting as unwilling accomplices in a vicious circle of environmental degradation and immiserating production. As they acquire a greater capacity for self-governance, their social and political organizations have begun to develop strategies to support demands for more local autonomy and productive diversification. Constructing such alternative strategies involves the complex interplay of the traditional and the modern. On the one hand, the accumulated knowledge required to manage local ecosystems is fundamental to identify the possibilities that available resources offer for addressing basic needs while also searching for paths to productive diversification that will permit an advantageous interchange with people in other regions of the

[5] Similarly, in another Purhépecha community, a women's artisan group has introduced technological innovation to produce lead-free pottery in response to market demands, alike continuing to make the traditional styles that uses the leaded glazes.

country or parts of the world. This latter process often requires alliances with other groups who have privileged access to markets and thereby can assure that the products will receive "fair trade" treatment when sold.

Our research program is designed to confront directly the challenges posed by an international economic system that limits opportunities for poorer social groups seeking to assert their capacity for self-governance. Our work is driven by a deliberate search for strategies that will enable the participants to resist the pressures of globalization by creating opportunities for local self-management and production. Increasingly, communities are becoming aware of the limitations of the prevailing economic model, which, at best, offers the possibility of proletarian employment or, in the majority of cases, informal marginality. The construction of alternative structures for governance, resource management, and production is an urgent task to which they are increasingly turning.

In this article, we offer a number of examples in which university based teams were able to identify ways in which it could interact with indigenous groups and other social organizations associated with these communities to help strengthen their collective projects. This experience is based upon the idea that people codify their knowledge systems in such a way as to attempt to manage their environments as well as possible and to produce the goods they need for their own well-being as well as to assure themselves the possibility of improving their conditions.[6] In what

[6] This approach is elaborated at greater length in David Barkin, 1998. *Wealth, Poverty and Sustainable Development*, Editorial Jus, Mexico City, Mexico, as well as in Toledo, Victor Manuel. 2000. *La Paz en Chiapas: Ecología, luchas indígenas y modernidad alternativa*. Mexico: UNAM y Quinto Sol. A summary of Barkin's book can be found in Harris, 2000, mentioned in Note 9.

follows, we offer examples of how we went about implementing these programs of collaboration, individual cases that illustrate a larger process.

Innovation to maintain tradition.

For centuries backyard animal raising has been a central element in a diversified strategy for community consolidation in peasant societies around the world. Transnational corporations have systematically undermined this strategy by imposing new technologies that make small-scale family units uncompetitive and unviable. Genetic selection produced new breeds of poultry and hogs better suited to intensive feeding and factory-like conditions for reproduction and fattening. As a result, they have displaced the traditional races that are more efficient in processing household and small-farm waste streams, but required more time before they could be marketed. In our search for strategies to promote sustainable regional resource management, we found that communities in the mountains of west-central Mexico suffered when their hogs were fattened with avocados because the butchers in the region penalized the price because the animals did not have a layer of fat!

In fact, a local doctor, one of the co-authors of this paper (Alvizouri), discovered that the fruit actually lowered blood-serum cholesterol levels in people and used the finding to develop a treatment for arteriosclerosis. Our team took advantage of his experience to produce pork with a low fat content. By introducing small modifications in traditional diets for backyard animals, backyard hog raising is being encouraged as a complementary and profitable activity that would strengthen the regional economy and the role of women as a new social force. This project is the result of a systematic search for ways to improve the economy of an indigenous region by

focusing on those aspects of the regional economy that are controlled by women and where productivity could be improved with relative ease.

To implement the project, the authors began working with an umbrella group that encompasses about 350 communities and more than one-half million people in west-central Mexico who share a common ethnic heritage (Purhe'pecha, or Tarascan as they were called by the colonial settlers). The research and community work proposed to use local agricultural wastes that lower costs to create a quality product (pork 'lite') for which a premium price can be obtained. Traditional hog raising is still an important part in local Purhe'pecha communities and is being reintroduced in more acculturated villages. The initial effort to develop optimal diets for raising hogs with low cholesterol levels proved successful and the enthusiasm for the new technology exceed expectations. Now, some five years later, it is clear that the approach has been accepted and the main obstacle to its full implementation will be the need for people from the region to advise and supervise the quality of the diets and the conditions in which the pigs are raised in the backyard stalls.

In retrospect, the proposed innovation is proving relatively easy to implement because of a design that fits it into the existing structure of village life and political organization. Although based on a declining activity (hog raising), the proposed changes are clear to all participants who clearly understood the relationship between diet and animal nutrition; its commercial logic was also compelling, especially within today's precarious rural economy. Because of the focus on an activity that women have historically managed and the declining presence of men who must seek work elsewhere, the project has struck a particularly responsive chord. Furthermore, with a growing awareness of the need to improve sanitary conditions as a result of improving channels

of information and concern about health, the project also has created an opportunity to open a discussion of environmental issues, like water quality and sewage disposal and treatment.

As the production of "low-fat pork" moved to the implementation stages, we observed a growing demand in other villages to participate in the new industry. From the perspective of sustainable resource management and popular participation, another attractive feature of the program is its limited scale: the volume of production is inherently limited by the supply of waste avocados. It would not be advisable or profitable to use commercial grade fruit as fodder for the hogs. In this way the authors hope that the communities will avoid the health and environmental problems that are usually associated with large-scale hog raising elsewhere. There is now talk of building a small, certified butchering facility operated by the organization of Purhe'pecha communities, providing an opportunity to raise the quality of meat available in the region, while producing the low-fat pork products for the specialized markets that they are developing.[7]

An interesting development emerging from the work on 'lite' pork was the discovery of the nutritional qualities of a plant that could be valuable for feeding to hens to produce "enriched omega-3" eggs. The plant, *verdolaga* (purslane in English) was introduced by the Spanish *conquistadores* and spread widely as a weed in humid conditions. It was later incorporated into the colonial diet as an herb seasoned with a green chile sauce to accompany pork; it turns out, however, that it is very rich in Omega-3 and can be readily incorporated into the diet of laying hens, displacing the fatty omega-6 from their eggs, to produce a product that will have less of an impact on the cholesterol of consumers. This nutritional innovation in egg production systems in

[7] For more information on this project, consult Barón, Lourdes and David Barkin. 2001. "Innovations in Indigenous Production Systems to Maintain Tradition." In: Flora, Cornelia, Ed. *Interactions between Agroecosystems and Rural Human Community*. Miami, Fl.: CRC Press; pp. 211-219.

is part of a larger program to install wastewater treatment plants whose effluent would irrigate the plants and service the poultry. For indigenous and peasant groups searching for ways to diversify their economies and consolidate their social and political institutions, while contributing to improved environmental management, this program is a logical follow-on to the hog project in the central highlands. In this instance, the project does not propose to harness prior knowledge to produce enriched eggs, but rather to exploit a tradition of concern for the integrity of ecosystems in order to introduce a new activity that promises to generate new sources of income for the participants.

Recuperating territory, rehabilitating forests, strengthening traditional societies

Indigenous societies, pushed into the mountains by successive waves of productive expansion by conquerors, now find themselves heirs to valuable sources of the headwaters required for urban-industrial development throughout the world. One of the most notable aspects of the modernization crisis is the growing shortage of water, caused by demographic growth and its improper use in the production of goods and services. Heightened by industrial and domestic wastes callously dumped into local rivers and aquifers leaving them unsuitable for social use, the shortages are exacerbated by deforestation and the expansion of ranching and agriculture. Along with problems of global climate change and other ecological phenomena, the lack of water is becoming particularly serious, leading to a desperate search for solutions to mitigate the crisis. Many recent proposals for "sustainable production," based on individual economic rationality and a liberal development discourse, advancing a "modern" development strategy in which corporations and governments alike do not go beyond a process of "green washing" productive

proposals.[8] Although the sustainability discourse is generally a camouflage for the capitalist rationale and is tinged with a large measure of bio-colonialism where the indigenous and peasant inhabitants of the regions of mega-diversity do not participate, except as ecological informants and as objects to be rescued, it has also been an inspiration for alternative approaches, based on the local appropriation of these concepts by peoples conscious of the wealth of inherited knowledge that they can bring to bear to ameliorate environmental problems. These alternative discourses and perspectives have been cultivated mostly in the southern countries, in part by theorists, intellectuals or practitioners working directly with peoples who express their demands in terms of territorial defence, alternative development, autonomy, sustainability and self-sufficiency.[9] Normally, these proposals are designed from the local point of view, where the inhabitants become the protagonists of the recovery and preservation of their resources.

The model implemented in our Mexican projects draws on a long history of struggle by different social groups and reflection by Southern thinkers who have promoted alternative approaches to sustainability. The basic tenets of this work are: a) the active participation of the local population in the design and implementation of the plans a programs, so that they generate a capacity for self-management and a recuperation of social institutions and cultural identity; and b) the rational incorporation of the ecological diversity into a sound program that contributes to diversifying the

[8] Cf. Escobar, Arturo. 1995. *Encountering Development: The making and unmaking of the Third World.* Princeton, NJ: Princeton University Press; Leff, Enrique. 1998. *Saber Ambiental: Sustentablidad, Racionalidad, Complejidad, Poder*. Mexico: Siglo XXI; Utting, Peter. 2002. *The Greening of Business in the South: Rhetoric, Practice and Prospects*. London: Zed Press.

[9] The experience in the communities on the Oaxaca coast revealed that indigenous people define their lives within a specific territory, but not one limited to the immediate surroundings of their homes. Their territory usually extends from the heights of the mountains to the seashore. That is, they require a space that includes a number of ecosystems for their sustenance and cultural integrity. For further reflection on this problem, see Toledo, *op. cit.*, and Harris, Jonathan. 2000. *Rethinking Sustainability: Power, knowledge and institutions*. Ann Arbor, MI: University of Michigan Press

local economic base.[10] Thus, sustainability itself is a complex set of ideas that is understood differently as people assimilate the lessons into their own individual ethos. These ideas emerge from a group of theoretical dicta, which are then translated into practice as each community or group of peoples invents and specifies its own rules for participating in regional strategy, processes that are themselves transformed in the daily practice of daily co-existence.

From this perspective, then, people within their own cultures and in interaction with the larger society of which they are a part, constantly experiment with new proposals to strengthen their society and diversify their economy. As they integrate new activities, they design alternatives to prevent them from becoming economic refugees in the national and international urban centres; they also learn how to contribute to the development of their region without sacrificing their dignity, evaluating new activities as they develop new relationships between their own culture and the other, dominant one. It enables them to refrain from joining the low-waged labour force – a transitory opportunity, concentrated in the development poles– so that they can become protagonists of their own sustainable regional development. This vision contributes to making them stronger, and permits them to avoid the extremes of poverty and ecological degradation that oppress so many. The conflicts between the practitioners and the dispossessed are also reduced, as the outsiders are required to recognize that the locals have a prior claim to the territory.

The active participation of the indigenous and rural communities in the reconstruction and preservation of the ecosystems is vital, because history has placed them in the richest centres of

[10] Cf. Barabas, Alicia and Miguel Bartolomé. 1999, "Los protagonistas de las alternativas autonómicas." En: A. Barabas and M. Bartolomé (eds.), Configuraciones étnicas en Oaxaca. Perspectivas etnográficas para las autonomies, Vol. I. Mexico: Instituto Nacional Indigenista, Instituto Nacional de Antropología e Historia; Regino, Adelfo. 1999. "Los pueblos indígenas: diversidad negada." Chiapas 7. Mexico: Ediciones Era. See also: Barkin, 1998, *op. cit.*; Toledo, 2000, *op.cit.*; Leff, 1998, *op.cit.*

biodiversity. They understand the cycles for reproduction and conservation, product of cultural development based on a lengthy process of social and ecological interaction. For this reason, they often assume their responsibility as "guardians of the forests" without extra compensation; it is just another job they must do in order to use their own ecosystems, frequently defined as "national lands" or protected areas.

This example involves a proposal by a local NGO (non-governmental organization) to collaborate with indigenous communities dispersed in the Sierra Madre del Sur (a mountain range on the south Pacific coast of Oaxaca), to attack the accelerated process of deforestation that decades of "top-grading" occasioned. A serious imbalance in the regional hydraulic system was discovered, the product not simply of a lower rate of recharge of the water table for but also of excessive withdrawals resulting from new infrastructure installed for a mega-tourist resort being installed in the Bahias de Huatulco. The Centro de Soporte Ecológico (CSE) proposed an environmental rehabilitation program in which the participants would be invited to recover their life styles, reinforcing local institutions and diversifying the productive structure. It explicitly rejects the paternalistic and clientelist approach of government programs implemented in Mexico since the 1917 Revolution. The program of "productive conservation"[11] involved a new management model that incorporates all of the stakeholders in the decision-making structure, including the communities themselves, the water users in Huatulco and the financing agencies; it was designed with three objectives in mind: a) to reconstruct and conserve the region's basins and forests; b) to use the ecosystems in a sustainable manner; and c) to join the inhabitants of the coast of Oaxaca in their efforts to recover their dignity. This involves training to implement clean

[11] Productive conservation refers to the concept of rehabilitating forests in which some trees would be cut and a great deal of wood from regular pruning activities would be extracted for use in making wood products to be sold on fair trade markets.

technologies as well as updating traditional techniques as the communities attempt to deal with practical problems on a day-to-day basis. The proposal for the sustainable use of natural resources involves using the by-products from forest maintenance efforts - branches cut off for pruning and small trees cut for thinning the forests- rather than cutting the main growth. This helps reduce the problem of people selling trees to the closest buyer as well as emigration from the region.[12]

The reforestation program was designed to diversify the rural economy by introducing alternative productive systems to raise incomes and strengthen local institutions, blending traditional knowledge systems for conservation with modern production techniques. By deliberately planting surplus trees that must be thinned out to allow for a healthy forest wood was available to be worked into parts for "director" chairs, while branches gleaned from pruning are shaped into parts for tables, desks and even baseball bats and decorative figures, generating new jobs and income, avoiding the sacrifice of the healthiest trees. The project is aimed at regenerating the forest, and with it, protecting endangered fauna allowing some portion to be used in traditional settings for local consumption. It also stimulates local ecotourism businesses and allows; the regeneration of the agricultural areas in the river basins using deep rooted grasses and legumes to improve the land's fertility.[13] If the Centre for Ecological Support had not considered the enormous potential of traditional knowledge in ecosystem management, the project would have

[12] Barkin, David and Carlos Paillés. 2002. "NGO-collaboration for ecotourism: A strategy for Sustainable Regional Development in Oaxaca." *Current Issues in Tourism*, Vol. 5:3(245-253). Barkin, David and Carlos Paillés. 2000. "Water and Forests as Instruments for Sustainable Regional Development." *International Journal of Water*, Vol. 1:1(71-79).

[13] The preferred grass is called "vetiver," selected for its ability to stabilize the soils while a very productive native legume (*Mucuna deeringianum*) fixes nitrogen in the soil (Buckles, David. 1993. "La revolución de los abonos verdes." *Pasos*, Vol. V:5 (30-33). http://www.laneta.apc.org/pasos/fbuck1.htm).

encountered greater resistance from the local communities, as is common in most projects designed by official development agencies in central offices.

Water Forever[14]

The Mixtecan peoples are an impoverished group living in a desolate region in north-central Oaxaca and Puebla, which has suffered from a lengthy process of environmental degradation as a result of centuries of over exploitation. A group of young people from the National University (UNAM) proposed to collaborate with the 150,000 people living in the region to implement an ecosystem rehabilitation program, based primarily on water and land management techniques. During the ensuing quarter-century since the program began, an ambitious series of projects have improved conditions in the 1.5 million hectare region, on the basis of a program firmly anchored in community mobilization and training, based on attacking the problem of water scarcity. They identified the origins of the problem of water scarcity as the result of three factors: population increase, inadequate management of natural resources in the region, and unequal access to water, and most especially the over drawing of water supplies by a small number of people imposing their will over the community through corrupt power structures.

It was clear that deforestation and surface erosion were the main problems to be attacked. The uncontrolled logging was the result of lumber needs for subsistence uses, including firewood and

[14] For a more detailed description of this and other local initiatives for water management in Mexico see: Barkin, David. (Ed.). 2001. *Innovaciones Mexicanas en el Manejo del Agua*. Mexico: Universidad Autónoma Metropolitana. The group responsible for this program, Alternativas y Procesos de Participación Social, is directed by Raúl Hernández Garcíadiego y Gisela Herrerías Guerra

home construction, and more dramatically, illegal cutting for commercial sale. In this setting, various land management projects, including dikes, terraces and dames seemed to be indicated, but their cost made such an approach unrealistic. In the context of the local planning meetings it became clear that the community had not lost its rich inherited culture of water management. The discussions led to a proposal to undertake an ambitious program to rebuild the areas where ravines and gullies had been carved out by centuries of erosion and regenerate the watershed that had been severely damaged. This regeneration process began in the higher reaches, with reforestation, using native species, and small earthen works to slow down the surface water run-off, rebuild soil, to retain some of the topsoil that would otherwise be washed away, and increase water infiltration so that it would be channelled to other parts of the region where it would used for production. A wide variety of techniques were implemented so that people from all of the communities could participate in spite of the fact that heavy equipment was not available. Stone dams were raised to accumulate soil in areas where new areas for cultivation were appropriate; water holes were emplaced to permit a more systematic development of small herds of animals, while cactuses were replanted for their fruits and water retention qualities as well as to stabilize the terraces. The cumulative effect of the hundreds of these small efforts was to substantially increase the area of arable land under cultivation and to increase the volumes of water available for agricultural production, for the animals, and for the communities.

The project is particularly important because it was designed to be implemented and maintained by the communities rather than by outside contractors. Therefore, the limited resources that were available from outside were channelled directly into employment creation programs, that were concentrated in the seasons when agricultural chores were least demanding, thus reducing the pressures for season migration from the area. Using local materials and resources also increased

its regional impact. Finally, the integration of the local understanding of water works and land management has produced an exceptionally effective hydraulic system that is turning out to be reminiscent of the pre-Colombian irrigation works described by archaeologists and admired buy the Spanish colonizers. Rather than an imposition of an outside development agency, the approach implemented in the Mixteca offers a way to reaffirm local cultures and consolidate community institutions and processes that are now extending themselves into the production of traditional and modern agroindustrial products for sale outside the region.

Similar community management projects are springing up throughout Mexico. Community forest management projects now encompass more than one-half of the nation's wood resources, where local groups are developing their own production programs and complementing the protection programs with ecotourism, artisan production, water bottling and the sale of environmental services. Most importantly, these programs are examples of the way in which people are learning to appreciate the value of their inherited cultural traditions and enriching them with techniques and lessons from the current era.

Conclusion

There are numerous other areas in which traditional knowledges are being harnessed to product communities and their ecosystems. Even in the metropolitan area of Mexico, several projects are taking advantage of local resources to reinforce local economies and political structures. A degraded forest is being rehabilitated as an urban forest and nature preserve where tens of thousands of visitors are treated to a unique set of hiking and biking trails and where nature talks inform and entertain; a trout nursery provides an opportunity for diners to select their own

specimen for lunch. A pre-Colombian amphibian, the Axolotl, has become a charismatic attraction for visitors to the "floating gardens" of Xochimilco, where one local community has decided to abandon the crass commercialism of the bawdy trips along the canals in favor of a more sedate tour for people attracted by the opportunity to understand how the complex ecosystem is maintained and can be managed to provide a variegated cornucopia of fruits, vegetables and small animals that protect the environment and provide for the economic well-being of the people.

If there is one lesson that can be extracted from the Mexican experience in rescuing traditional knowledges, it is for tradition to survive it must become a living process, a resource that is constantly renewed to assure its currency and its value to those that depend on it for their survival as a people, as a culture. In Mexico, these numerous groups, than now comprise more than one-quarter of the population, indigenous epistemologies are truly a building block for constructing alternatives to globalization: and thus to turning into reality the slogan of yesterday's marchers:

MANY OTHER WORLDS ARE POSSIBLE